# INSTRUCTION PROGRAM REVIEW: SPRING 2013 SUBMISSION CYCLE

Program Name: Computer and Information Science
Faculty Contact: Martha Tilmann

Academic Year: 2011-2012
Program Review Submission Date: 3/25/13

## I. 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 planning documents as appropriate.

The Computer Information Science Department (CIS) offers 20-23 sections of 15-20 separate courses each semester, ranging from *Intro to Computer Information Science* through advanced programming, *Computer Forensics*, and *Internet Programming* courses. From the College Mission statement, CIS courses and programs directly support institutional priorities "Promote Academic Excellence" and "Promote Relevant, High-Quality Programs and Services." All courses are certificate-applicable, Associate Degree-applicable, and/or university-transferable. Additionally, one course meets the information competency Associate Degree requirement. CIS also supports the institutional priority for "Student Success" by offering courses in both the online and traditional mode and, where possible, in a predictable scheduling pattern.

## II. Summary of Student and Program Data

*A. Student Learning Outcomes Assessment*

Summarize recent SLO assessments, identify trends, and discuss areas in need of improvement.

CIS 110 SLOs
Fall 2012

> *SLO 02: Differentiate between basic concepts of computer hardware and software.* Students performed at an 82% level on this assignment. This includes 15% of students did not turn in the assignment.

> *SLO 07: Demonstrate ability to use and evaluate Internet tools for research.* Students earned 96% on the final paper illustrating the Information Competency laid out in the preparatory assignments.

Spring 2013

> SLO 03: *Demonstrate use of the operating system to effectively organize and maintain computer files.* Students performed at an 81% level on this assignment. This includes 20% of students did not turn in the assignment.

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. These students eventually drop the class leading to low retention. One issue is getting students off to the right start in the distance mode. Optional orientation meetings are held, but it would be best augmented by an interactive orientation video. To this end the department requests *Camtasia* under the instructional materials. This video recording/editing software will provide an effective means to deliver course material in a more engaging way. Faculty of CIS 110 has already taken the mini-STOT training on this product

and other faculty will also be able to be trained.  A second issue may be that instructional materials are geared for the PC platform when an increasing number of students are using the Mac computer system.  It would be helpful for instructors in this foundation class (and perhaps others) to have both a PC and Mac to develop appropriate instructions and materials for both.  Thus under equipment requests is the acquisition of a Mac.

**CIS 114 SLO Assessments**
<u>Fall 2012</u>
All seven SLOs for CIS 114 were assessed, with successful outcomes ranging from 70-100% for individual SLOs.  Lack of participation is the most predominant factor leading to non-success in CIS 114.  Up to 20% of enrolled students fail to log into WebAccess even once and do not respond to email.  Students who regularly participate in the class forum and avail themselves of online office hours or other forms of contact generally succeed.  The class had a 54% retention rate in fall 2012, with 71.4% of those students successfully completing the class.  Of the successful completions, 70% of those students earned an A.  PRIE data shows a 71.4% retention rate for CIS 114 over 2009-2011, with a success rate of 66.7%.

Several factors currently affect retention. One recent issue was misinformed counselors, who incorrectly told students to enroll in the class when they did not have the recommended preparation.  Several counselors told students who had only taken CIS 110 that they had the recommended preparation.  One student was unable to complete the second assignment and, by that time, it was too late to get into the intro programming class that he needed.  Fortunately other students were able to transfer to the intro classes before the deadline.  Students seem to feel that if a counselor told them to enroll in the class then they should be there and, as a result, will not respond to numerous emails and announcements informing them of the course requirements.

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 will occasionally insist on reinstatement, complaining to the registrar and/or the dean.  This negatively impacts the success rate.

Fortunately in spring 2013 there were almost no unqualified students enrolled in the class, though not all students participate despite possessing adequate or advanced programming knowledge and experience.

The instructor needs a Mac computer for online internet programming courses.  In CIS 114 most students use Macs and ask specific Mac-related questions, which the instructor often cannot answer.  JavaScript programs behave differently in different browsers, especially on a Mac. Students are thus forced to help each other because the instructor often cannot answer Mac questions and is unable to duplicate Mac behavior on a PC.  This might also contribute to non-success in the class.  CIS instructors at other California community colleges are given Macs and laptops, and often iPads or other tablet computers.

The CIS 114 instructor has a refurbished Dell laptop running XP that is no longer serviced by ITS.  All previous requests for a Mac computer have been ignored for several years, despite the fact that the instructor teaches

technological subjects requiring recent technology. At a minimum, instructors teaching online internet programming courses should have both a Mac and a Windows laptop (or a dual-boot Mac).

## CIS 254 SLO Assessments
Fall 2012

All ten SLOs for CIS 254 were assessed, with successful outcomes ranging from 80-100% for individual SLOs. Absenteeism is the predominant factor leading to non-success in CIS 254. Students who regularly attend lecture and lab sessions generally succeed. The availability of CIS tutors in the Learning Center beginning fall 2012 has significantly aided retention and success. Several students who initially wanted to drop the class were persuaded to remain and credited their success with the tutoring they received from the Learning Center. Only 3 out of 26 students did not pass the class. 88.5% of retained students succeeded. This has led to record enrollment in CIS 255 for spring 2013, the second-semester programming course.

## CIS 255 SLO Assessments
Spring 2012

All eight SLOs for CIS 255 were assessed, with successful outcomes ranging from 75-100% for individual SLOs. 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. The retention rate was 62.5%, with only one of the retained students not succeeding. PRIE data show a retention rate of 74.6% and a success rate of 64.4% for 2009-2011.

## CIS 278 SLOs
**Fall 2012**

> *SLO 01: Demonstrate knowledge and understanding of the principal object-oriented programming concepts.* Students performed at an 84% level on this exam question. Traditional students met the SLO 100%

> *SLO 02: Employ Unified Modeling Language (UML) notation ot model the object oriented design of a non-trivial computer program.* Students performed at a 94% level on this programming project. This is an improvement over the last assessment of this SLO. Traditional students met the SLO 100%.

> *SLO 03: Implement a medium-size computer program that is stylistically and functionally correct, based on an object-oriented design model.* Students performed at a 86% level on this programming project. This is an improvement over the last assessment of this SLO.

> *SLO 07: Create dynamically allocated variables.* Students performed at a 81% level on this programming project. This is an improvement over the last assessment of this SLO.

> Percentage comparisons between traditional and online students tend to vary. Last year Camtasia code demonstrations were added to areas covered for SLO3 and SLO7, which may account for the

improvement in these areas.  Videos will be added to over the other SLO areas to support the online audience.

## CIS 256/279 SLOs

   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 (using texts that are identical except for implementation language).

## Fall 2012

*SLO 01:  Implement a classic data structure as an Abstract Data Type class*. Students performed at a 100% level on this programming project.

*SLO 02:  Characterize an algorithm using Big 0 notation.*  Students performed at a 93% level on this exam question..

 SLO 02 is a fundamental outcome for this course.  Although the measured performance is always high, it should be 100% for students who complete this course.  The tools which have been used to measure this SLO occur early in the course, when the Big O concepts are first presented.  This may not be entirely accurate for students who complete the course, and for the next assessment cycle a final exam question will be used to track this SLO.

*SLO 03:  Select an appropriate data sort, based on characteristics of data to be sorted together with frequency of sort;*  Students performed at a 94% level on this exam question.

*SLO 04:*  Employ algorithmic patterns to array, linked and recursive  s*tructures* .  Students performed at a 94% level on this exam question.

While these concepts are practiced in homework and given adequate text coverage, online students do not score as high in SLO measurements.  Camtasia code demonstration videos will be developed to present these basic sorts and traversal patterns.

## CIS 380 SLO Assessments

Fall 2012

All nine SLOs for CIS 380 were assessed, with successful outcomes ranging from 80-100% for individual SLOs.  Lack of participation is the predominant factor leading to non-success in CIS 380.  Up to 20% of enrolled students fail to log into WebAccess even once and do not respond to email.  Other students will initially participate, but later stop.  Students who regularly participate in the class forum and avail themselves of online office hours or other forms of contact generally succeed.  Assignments are not especially difficult, given that a student keeps up with required reading and does not start them at the last minute. The class had a 64% retention rate in fall 2012, with only three retained students unsuccessful.  PRIE data shows a 72.2% retention rate over 2009-2011, with a success rate of 62.5%.

The majority of students who drop or withdraw from the class are conscientious A or B students who, for personal reasons, feel that they no longer have adequate time to devote to the coursework. This class often has a full waitlist. Unfortunately not all waitlisted students can be added but, because of lack of participation by some registered students, qualified and motivated waitlisted students can lose the opportunity to enroll in the class.

The instructor needs a Mac computer in order to help students who must use a SSH client to connect to the web server. Connecting with a Windows computer is entirely different than with a Mac, and students need Mac-specific instructions. Students are forced to help each other because the instructor cannot recreate Mac-related problems on a Windows computer. This might also contribute to non-success in the class. Since the majority of internet programming students use Macs it is imperative that the instructor also have access to the same operating system.

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.

The successful completion rate for 2010-2011 CIS courses in fall, spring, and summer was 51%, 58.9%, and 71.8% respectively. The accumulated average is 69.7%. CIS courses have a 71.3%, 75.2%, and 82.2% retention rate for fall, spring, and summer respectively. On average this means CIS is 8.6% below the college's 84.8% retention rate. Regarding other measures, CIS students are similar to the college overall with younger students having the lowest success rates while older students have the highest successful course completion rates. Students in the fundamental and transfer courses are more often under 24 years of age. Courses leading to certificates or are classified as CTE have more students over 24 years of age. All CIS courses have approximately a 7 to 3 male to female ratio. This compares to the college male to female ratio of 4 to 5. The success rate of males and females is about the same at approximately 54%. The top three ethnic groups in the CIS courses are White (39.5%), Asian (22.65%) and Hispanic (8.42%). At the college level these groups have 33.8% (White), 18.5% (Asian), and 22.9% (Hispanic). There are few Filipinos in the fundamental or transfer classes, but they primarily show up in the CTE courses. CIS has one fundamental (GE) course in the college's top 100 "enrolment size" which comes in at a 72% success rate (17th college wide).

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

CIS courses taught in the distance mode have a retention rate of 58.9% compared to an 80.46% rate for traditional classes. This compares with the college's overall rates of 79% for the distance mode and 81% for traditional mode. The 2011 success rate for CIS online courses is 49% compared to a 70% success rate for traditional courses. The college's overall success rate for both online and traditional courses is 62%. Thus

compared to the college, CIS online classes are 13% less successful, and CIS traditional classes are 8% better than the overall college's success rate.

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.).

CIS's LOAD has remained essentially constant the last three years with only a 2% decrease in 2011-2012. LOAD for 2011-2012 is 513.5 compared to the college average of 539. One CIS full-time faculty retired recently, but the department still retains a 65.6% ratio of full time faculty to adjunct.

D. *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.

> NOTE: The new CTE-course requirement dictates that outlines must be updated every two years. That leaves thirteen classes to update with many taught by adjuncts. Currently, there is no plan for how to address the issue of redoing course outlines in areas where full-time faculty do not have an expertise.

| Courses to be updated | Faculty contact | Submission month | Last Update |
|---|---|---|---|
| CIS 111 Intro to Internet Programming | Green | 4/2013 | 2006 |
| CIS 151 Networks and Digital Communication | ? | ? | 2006 |
| CIS 254 Intro to Object Oriented Program Design | Grasso / Green | 12/2013 | 2007 |
| CIS 255 (CS1) Programming Methods: Java | Green | 4/2013 | 2009 |
| CIS 256 (CS2) Data Structures: Java | Grasso | 12/2013 | 2005 |
| CIS 278 (CS1) Programming Methods: C++ | Grasso | 12/2013 | 2002 |
| CIS 279 (CS2) Data Structures: C++ | Grasso | 12/2013 | 2005 |
| CIS 364 Enterprise Data Warehousing | Green | 4/2013 | 2008 |
| CIS 479 Networking Security Fundamentals | ? | ? | 2006 |
| CIS 489 Computer Forensics | ? | ? | 2006 |
| CIS 490 Computer Forensics: Network Analysis and Defense | ? | ? | 2006 |
| CIS 491 Computer Forensics: Search and Seizure | ? | ? | 2007 |
| CIS 492 Computer Forensics: White Collar Crime | ? | ? | 2006 |

E. *Website Review*

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

| Faculty contact(s) | Date of next review/update |
|---|---|
| Content owner is Stacey Grasso<br>Updater is Michelle Schneider | Last update 3/2013 |

F. *Additional Career Technical Education Data – CTE programs only. (This information is required by California Ed. Code 78016.)*

1. Review the program's Gainful Employment Disclosure Data, External Community, and other institutional research or labor market data as applicable. Explain how the program meets a documented labor market demand without unnecessary duplication of other training programs in the area. Summarize student outcomes in terms of degrees, certificates, and employment. Identify areas of accomplishment and areas of concern.

[NOTE to designers of Program Review form: The College of San Mateo's report on educational programs leading to gainful employment (found at the link in the question above) is not complete or current.]

At this time CIS has four AS degrees and eight certificates supported by a total of twenty-four different courses. Of these courses, seven are transfer or general education courses that support the computer programming core curriculum. The computer programming courses also serve as CTE when awarded through the Certificate of Specialization. The remaining courses form the department's CTE tracks of Internet Programming and Computer Forensics. CIS Advisory Committee, although originally formed for the CTE tracks, offers feedback and direction on all CIS's curriculum.

| Associate in Science Degrees | |
|---|---|
| Computer and Information Science | Transfer |
| Computer and Network Forensics | CTE |
| Computer Science Applications and Development | Transfer |
| Web and Mobile Application Development | CTE – NEW* |
| Certificate of Achievement | |
| Computer and Network Forensics | CTE |
| Computer Science Applications & Development | Transfer |
| Web and Mobile Application Development | CTE – NEW* |
| Certificate of Specialization | |
| C++ Programming | CTE |
| CIS Network Security Specialist | CTE |
| Computer Forensics | CTE |
| Internet Programming | CTE |
| Java Programming | CTE |

* The department plans to offer a new AS degree and Certificate of Achievement in *Web and Mobile Application Development* in fall 2013 (pending state approval). This would greatly expand and enhance the Internet Programming track.

*2.* Review and update the program's Advisory Committee information. Provide the date of most recent advisory committee meeting.

The CIS Advisory Board meets annually in the spring. It is typically well-attended and has the following distinguished members:

| Advisory Members | Company |
|---|---|
| Zach Brown | Hitachi |
| Tom Burre | Senior Application Developer - Soliant Consulting |
| Greg Doolittle | Apple |
| Moshe Gotesman | Walmart.com |
| Chris Heckart | IBM |
| Stormy Maddox | Information Security Office San Mateo County |
| William Paoli | Atlassian |
| Ex-Officio Members | |
| Kathy Ross | Dean Business and Technology |
| Ron Brown | CIS Faculty |
| Stacey Grasso | CIS Faculty |
| Melissa Green | CIS Faculty |
| Cory Putnam | Instructional Aide II/CIS |
| Martha Tilmann | CIS Faculty |
| Bob Timlin | CIS Faculty/Sutter Health |

At last spring's meeting the board gave the department several suggestions, including but not limited to:

1. Offering a degree in *Web and Mobile Application Development*; (Completed fall 2012.)
2. Exploring Udacity (and/or MOOCs) as a resource and possible model for curriculum; (See Plan 3.)
3. Incorporating CIS and technology curriculum into the Nursing Program; and
4. Adding Data Analytics to some courses.

---

**III. Student Learning Outcomes Scheduling and Alignment**

---

A. *Course SLO Assessment*

Explain any recent or projected modifications to the course SLO assessment process or schedule.

All courses have SLOs and assessment is being done by all full-time faculty on an ongoing basis. No adjustment or modifications are projected in this schedule.  Classes taught by adjuncts have SLOs but do not have a projected plan for assessment.

*B. Program SLO Assessment*

Explain any recent or projected modifications to the program SLO assessment process or schedule.

The department has completed Objectives and SLOs for its A.S. degrees as shown below and they are appropriately published on the college SLO website. Below are listed the CIS A.S. degree program Objectives followed by the SLO. Assessment is ongoing although not formalized.

**Technical Competency**
1. Apply computer science concepts to design and implement software solutions to problems;
   SLO: Students will demonstrate the ability to use computer science concepts and program matching skills to design and implement software solutions to problems.

2. Use a variety of software tools, operating systems and/or computer languages;
   SLO: Students will have the ability to use a variety of software tools, operating systems, and/or computer languages.

3. Acquire new technological skills by building upon discipline fundamentals;
   SLO: Students will have an understanding of how to obtain information on computer concepts and discipline details. This understanding will provide them with the foundation necessary to pursue further learning.

**Interpersonal Skills**
4. Verbally communicate ideas and concepts clearly in an organized manner;
   SLO: Students will demonstrate the ability to verbally communicate ideas and concepts clearly and in an organized manner.

5. Write clear system documentation, user documentation and research papers and/or posters;
   SLO: Students will demonstrate the ability to write clear system documentation, user documentation, and research papers and/or posters.

6. Work as a team member in a problem solving situation;
   SLO: Students will demonstrate the ability to work as a team member in a problem-solving situation.

**Professional Awareness**
7. Be aware of their professional responsibilities regarding key ethical issues affecting computer science.
   SLO: Students will be aware of key ethical issues affecting computer science and their responsibilities as computer science professionals.

*C. SLO Alignment*

Discuss how Course SLOs support Program SLOs. Discuss how Course and/or Program SLOs support Institutional/GE SLOs.  Refer to TracDat related Program and Institutional SLO reports.

| GE-SLOs Program Courses | Effective Communication | Quantitative Skills | Critical Thinking | Social Awareness and Diversity | Ethical Responsibility |
|---|---|---|---|---|---|
| CIS 110 | X | X | X | X | X |
| CIS 111 | X | X | X | | |
| CIS 113 | X | X | X | | |
| CIS 114 | X | X | X | | |
| CIS 117 | X | X | X | | |
| CIS 121 | X | X | X | | |
| CIS 125 | X | X | X | | |
| CIS 127 | X | X | X | | |
| CIS 132 | X | X | X | X | X |
| CIS 151 | X | X | X | | |
| CIS 254 | X | X | X | X | X |
| CIS 255 | X | X | X | X | X |
| CIS 256 | X | X | X | | |
| CIS 278 | X | X | X | | |
| CIS 279 | X | X | X | | |
| CIS 363 | X | X | X | X | X |
| CIS 364 | X | X | X | X | X |
| CIS 379 | X | X | X | | |
| CIS 380 | X | X | X | | |
| CIS 420 | X | X | X | | |
| CIS 479 | X | X | X | X | |
| CIS 489 | X | X | X | X | |
| CIS 490 | X | X | X | X | X |
| CIS 491 | X | X | X | X | X |
| CIS 492 | X | X | X | X | X |

## IV. 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.

|  | Internal Factors | External Factors |
|---|---|---|
| Strengths | The department has experienced instructors, who are well-versed in course material and have seasoned teaching skills.

Most courses are offered online for the convenience of students who cannot easily get to campus.

Advanced, more specialized courses are often taught by industry professionals who can offer a 'real world' flavor to the material. | The CIS department meets yearly with an Advisory Committee made up of industry specialists and past students in order to brainstorm for needed program change. This has the added benefit of making the department eligible for VTEA funding, which can be used for training and equipment to enhance program offerings. |
| Weaknesses | Due to low enrollment, some high-end courses must be canceled, requiring students to find suitable replacements elsewhere. When students go to other campuses they often to not return.

Due to low enrollment, some courses must be offered as cross-lists to make minimum enrollment numbers, placing an extra time burden on instructors. Additionally, the crossing of traditional/online sections does not always allow the instructor to best meet the needs of these two diverse audiences.

Cancellation of required courses for the Computer and Network Forensics degree/certificate can force students to wait up to two additional years to complete their program. | Students are often underprepared in the Math/Reading areas, and take courses before they are ready.

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. |
| Opportunities | Living in the Bay Area, provides the opportunity to hire faculty who are involved with leading-edge technology.

Former students will often return when a new course is offered in a recent technology. Attention must be paid to computing trends to keep the program relevant. | CSM's Marketing Division could capitalize on the increasing age of students and produce advertising materials better geared to the returning student.

PRIE could develop specific student distribution lists to better target email invitation for students to consider a certain class.

Hiring in the tech sector has rebounded dramatically in the Bay Area. There are many opportunities for students, especially in web development. |

| Threats | The ever-changing nature of CIS requires constant retraining and rethinking of curricula. The college does not provide adequate or timely professional development of retraining. CIS faculty typically spends summer, spring and/or winter break learning new technologies or updating skills.<br><br>Attrition reduces the number of students who go on to enroll in upper-level courses. This forces cross-linked courses to be offered in order to continue some course offerings. The instructor teaches two or three sections, lecture and online, but is only credited with teaching a single course.<br><br>Computerized prerequisite checking continues to block students from easily entering CIS classes. The pathway is not clear or easy for a student to get through the challenge or equivalency process.<br><br>Continued cancellation of Computer Forensics classes has prevented students from completing the program. Students wait up to two years to take required courses. This has endangered the future of the program. Further discussion about the current program and its possible incorporation into a new computer security curriculum must take place. | Although students are still interested in CIS, the notable shift in the job market has dropped enrollment drastically over the last six years and is only recently rebounding<br><br>Competition of neighboring community colleges providing similar curricula can sometimes drain from CSM's enrollment. |
|---|---|---|

## V. Institutional Planning

### A.  Results of Plans and Actions

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

In section *VI. Goals, Action Steps, and Outcomes* of last year's CIS Program Review faculty listed the goals shown below.  All three of these goals were achieved either fully or partially

a. Apply to the State Chancellor's Office for approval of an online Associate of Science degree and a Certificate of Achievement in *Web and Mobile Application Development*.

> The *Web and Mobile Application Development* A.S. and Certificate of Achievement were approved by COI in December, 2012 and will be submitted for state approval in June, 2013.  If approved, they will appear in the 2013-2014 college catalog.  Class instruction in this area will begin fall 2013.

b. Secure a tutor who would serve all of the department's CIS courses.

> The college's new Learning Center now employs two tutors for the CIS classes.

c. Improve the CIS-SLO book keeping and assessment process.

Improvement on SLO tracking and assessing has been made by all full time faculty.   However, the department continues to struggle with some parts of this system. Effective use of the TracDat would be greatly increased if

there was an online tutorial illustrating simple entry instructions and a *sample* department to view. It should be noted that the new SLO coordinator is extremely responsive and does provide assistance when asked. Secondly, getting assessment from classes taught by adjuncts is difficult. This problem is compounded in CIS, because its adjuncts are hired to teach very specialized technologies in which full-time faculty do not have expertize.

In addition, there is no interface between WebAccess and TracDat so SLO information already compiled in WebAccess must be manually entered into TracDat. And SLOs stored in TracDat must be manually entered into WebAccess, despite the fact that they were also previously entered manually into TracDat. This duplication of effort is highly inefficient and time-consuming.

### B. *Program 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 planning documents as appropriate. Address trends in the SLO assessment results and student success indicators and data noted in Section II. Summary of Student and Program Data.

[*Note*: 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 Sections II.F.1 and II.F.2.]

[*Note*: Specific plans to be implemented in the *next year* should be entered in Section V.C.]

The Computer and Information Science department will continue to build on its strengths as shown in section IV above to provide an educational experience that is appropriate to the needs of the community and the computer industry by:
- Continuing its commitment to robust programs in transfer, occupational education, and lifelong learning.
- 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 ever-changing nature of CIS requires constant retraining and rethinking of curricula. The college does not provide adequate or timely professional development for retraining in such a dynamic discipline. CIS faculty typically spend summers, spring and/or winter breaks learning new technologies or updating skills. Most of the CIS courses are additionally taught in the distance mode which adds the need for training in the teaching

methodologies and technologies supporting online instruction.

It would be beneficial if applications for professional development in cutting-edge technologies were evaluated in light of the fact that it might be unknown exactly how faculty would learn the technology at the time of application.   Also, faculty in this area needs adequate release time to learn these technologies and develop new courses.  There are no "plug-in" educational solutions for new technologies as are available in more established fields.

Without this support CIS faculty often lag a full year or more behind industry standards.  Another solution would be to allow more release time funded from outside the Professional Development fund.   For computer science faculty to stay fully-informed on the discipline's changes that directly affect the students, the load should be reduce to 12-units at least one semester each year.  This could also facilitate the management of SLOs and assessment for the specialized technologies that adjuncts teach.

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 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 and computer science tutors.

3. To guide the Institutional Planning Committee (IPC) in long-range planning, discuss any major changes in resource needs anticipated in the *next six years*.  Examples: faculty retirements, equipment obsolescence, space allocation.  Leave sections blank if no major changes are anticipated.  Specific resource requests for the next academic year should be itemized in Section VI.A below.

Faculty: There is likely to be a full time faculty retirement in the next six years.

Equipment and Technology: The CIS Computer lab 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.  Additionally each faculty will need new high-end computers within this timeframe.   The internet programming courses now use an off-site web server as a replacement for the csmcis2 server.  If that web server proves to be inadequate (highly likely) for the needs of the new Web and Mobile Application Development curriculum, the department will need to purchase a new web server.

Instructional Materials:  The beginning programming classes use Lego Mindstorms robots for instruction.  These will need to be maintained and replaced within the next six years.  Currently four robots need immediate replacement.  Most of these robots are now 5 years old.

Classified Staff: In December 2012 the CIS computer lab instructional aide left his position for another job.  A replacement was approved and the CIS department is currently in the process of hiring a new instructional aide.  Once in place there will be no need for additional staffing in the foreseeable future.

Facilities: CIS classrooms and computer lab are adequate. Building 19, however, has extremely poorly-maintained restrooms. Students and faculty alike 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.

*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*.*

According to the minutes from the *IPC Initiatives Developed At Fall, 2012 Planning Session*, IPC recognizes the need for "Rapid curriculum responses for "hotbed issues."  An initiative is "already underway" and will include the development of a process to accelerate a rapid response, which may include "Stipends/release time for faculty."  The CIS department strongly urges COI, the Professional Development Committee, and the VPI office to include CIS course development in the "hotbed" category and allow it quick and sufficient release time to keep the curriculum current with industry standards.

**Plan 1**

Title:

| Relearn and Re-implement the Banked Computer Architecture Course |
|---|

Description

| Description |
|---|
| CSM's CIS banked the Computer Architecture class when it was removed from the State's recommended first two-years of Computer Science curriculum. Recent discussions from CSU and UC, however, have determined that Computer Architecture should, again, be taught as part of the core in a student's first two years. This course would be required for the AS-T degree that would become effective 2014-2015.  To accommodate this trend, CIS would like to un-bank Computer Architecture and begin teaching it in fall 2014. |

| Action(s) | Completion Date | Measurable Outcome(s) |
|---|---|---|
| Re-Learn Computer Architecture<br>Submit COI paperwork for new course | Fall 2013 | - Faculty shows signs of being prepared.<br>-Paperwork is approved by COI. |
| Design and implement a CIS course offering in Computer Architecture to be offered in both online and traditional modes. | Spring 2014 | Course is prepared and uploaded to WebAccess<br><br>(4-units release time) |
| Offer the new Computer Architecture course. | Fall 2014 | Course offered fall 2014 |

**Plan 2**

Title:

| Learn Android and develop a new online Android course |
|---|

Description

| |
|---|
| Android is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers.  A course in this technology will greatly enhance the *Web and Mobile Application Development* AS and certificate offerings in the CIS curriculum.  It is the course most requested by web programming and Java students.  Application for professional development to learn Android and develop a new course was approved in spring 2013. |

| Action(s) | Completion Date | Measurable Outcome(s) |
|---|---|---|
| Submit COI paperwork for new course | Spring 2013 | Paperwork approved by COI. |
| -Learn the Android OS.<br><br>-Design and implement an online Android course. | Fall 2013 | -Faculty enrolls in and completes an Android class.<br>-Faculty concurrently develops materials for a new course.<br><br>(5-units release time) |
| Offer the new Android online course. | Spring 2014 | Experimental course offered spring 2014, to become a permanent course in 2014-2015 |

**Plan 3**

Title:

| |
|---|
| Create a CIS Course on an "Open Enrollment" Platform |

Description

| |
|---|
| The SMCCD is exploring the offering of courses on MOOCs and other open-enrollment courses.  The CIS Advisory Committee also recommended the department look at Udacity. There is a need for a department member to become familiar with this new direction, research available CIS courses, and determine if any are appropriate for our curriculum.  If there is, then develop an open-enrollment course for fall 2014.  At this time, the CIS foundation course, CIS 110, is the most likely candidate. |

| Action(s) | Completion Date | Measurable Outcome(s) |
|---|---|---|
| Learn the District's parameters and guidelines for using open-enrollments courses. Explore the range of CIS courses offered through Udacity (and/or MOOCs).  Report and discuss with department. | Fall 2013 | Hold a department meeting where all findings are reported.<br><br>Assess faculty members' interest in proceeding in this direction.<br><br>(1-unit of release time) |
| Develop MOOCs course for the department, most likely CIS 110. | Spring 2014 | A fully formed open-enrollment course completed in spring 2014. |

|  |  | (6-units of release time) |
|---|---|---|
| Offer the new open-enrollment course. | Fall 2014 | Course offered fall 2014 |

For additional plans, cut/paste from above and insert here. Or add an additional page. Number your additional plans accordingly.

*[Note: Itemize in Section VI.A. Any additional resources required to implement plans.]*

## VI. Resource Requests

### A. Itemized Resource Requests

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

Faculty

| Full-time faculty requests  (identify specialty if applicable) | Number of positions |
|---|---|
| NONE | |

Complete Full-Time Faculty Position Request Form for each position.

| Description of reassigned or hourly time for prioritized plans | Plan #(s) | Cost |
|---|---|---|
| Relearn and Re-implement the Banked Computer Architecture Course (To be implemented by: Stacey Grasso) | 1 | S14 – 4-units release time |
| Learn Android and develop a new online Android course (To be implemented by: Melissa Green) | 2 | F13 – 5-units release time |
| Create a CIS Course on an "Open Enrollment" Platform (To be implemented by: Martha Tilmann) | 3 | F13 – 1 unit S14 – 6-units release time |

Equipment and Technology

| Description (for ongoing program operation) | Cost |
|---|---|
| Faculty computer upgrades – PCs | $6000 |
| Additional Mac Computers for foundation and Internet Programming Faculty (As supported in the SLO assessment area of this report.) | $6000 |
| Web server to support new Web and Mobile Application Development curriculum as well as existing internet programming classes | $2000 |

| Description (for prioritized plans) | Plan #(s) | Cost |
|---|---|---|

| | | |
|---|---|---|
| No equipment cost | 1 | |
| No equipment cost | 2 | |
| No equipment cost | 3 | |

Instructional Materials

| Description (for ongoing program operation) | Cost |
|---|---|
| Camtasia Software for faculty's laptops (As supported in the SLO assessment area of this report.) | $300 per copy |
| 4 replacement Lego Mindstorms robots | $1,159.95 |

| Description (for prioritized plans) | Plan #(s) | Cost |
|---|---|---|
| No additional Instructional Materials needed | 1 | |
| No additional Instructional Materials needed | 2 | |
| No additional Instructional Materials needed | 3 | |

Classified Staff

| Description (for ongoing program operation) | Cost |
|---|---|
| NONE | |

| Description (for prioritized plans) | Plan #(s) | Cost |
|---|---|---|
| NONE | | |

Facilities

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

| Description (for prioritized plans) | Plan #(s) | Cost |
|---|---|---|
| Remodel restrooms on both floors | | ?? |
| Add a student sitting lounge (minimally put benches in hallways) | | ?? |

*B. Cost for Prioritized Plans*
Use the resources costs from Section VI.A. above to provide the total cost for each plan.

| Plan # | Plan Title | Total Cost |
|---|---|---|
| 1 | Step 1 | 4-units (s14) release time |
| 2 | Step 1 | 5-units (f13) release time $10,970.91 |
| 3 | Step 1 | 1-unit (f13) release time 6-units (s14) release time |