College of San Mateo — Program Review Submission

2014-2015 Instructional Program Review

Program Name: **Computer Information Science**
Program Contact: **Green, Melissa**
Academic Year: **2014-2015**
Status: **Submitted for review**
Updated on: **03/25/2015 10:20 PM**

1. Description of Program

Provide a brief description of the program and how it supports the college's **College Mission and Diversity Statements**, **Institutional Priorities, 2013/14-2015/16**, **5 in 5 College Strategies, Spring 2011**, and other **Institutional Program Planning** as appropriate.

Description of Program

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, and *Internet Programming* courses. The department has the following degrees and certificates:

Associate in Science Degrees	1. Computer and Information Science (60 units) 2. Web and Mobile Application Development (60 units) 3. Computer Science Applications and Development (60 units)
Certificates of Achievement	1. Web and Mobile Application Development (31-35 units) 2. Computer Science Applications and Development (31-34 units)
Certificates of Specialization	1. Web/Mobile App Development (15 unit) 2. Internet Programming (14-17 units) 3. Database Programming (14-15 units) 4. Java Programming (8 units) 5. C++ Programming (8 units)

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.

2. Student Learning and Program Data

A. Discuss Student Learning Outcomes Assessment

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

CIS 110 Individual SLOs' Results and Assessment

	Benchmark	Criterion Met	Results	Action
SLO 01	75% of the students will earn a score of 90-100%	YES	Eighty percent of the students achieved 75% or better. 86% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 83% This is an early assignment and many students do not yet have their text.	No action is required
SLO 02	75% of the students will earn a score of 90-100	YES	Eighty-six percent of the students achieved 75% or better. 73% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 86%.	No action is required
SLO 03	75% of the students will earn a score of 90-100	YES	Eighty-three percent of the students achieved 75% or better. 94% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 84%.	No action is required
SLO 04	75% of the students will earn a score of 90-100	YES	Seventy-six percent of the students achieved 75% or better. 100% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 85%.	No action is required
SLO 05	75% of the students will earn a score of 90-100%	NO	Seventy-two percent of the students achieved 75% or better. 100% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 76%.	The lab will be rewritten to clarify instructor's expectations
SLO 06	Benchmark: 75% of the students will earn a score	NO	Seventy-one percent of the students achieved 75% or better. 97% of those who did not reach the target score did not turn in the assignment.	The lab will be rewritten to clarify instructions with

	of 90-100%		The average score for this assignment was 70%.	additional supporting materials.
SLO 07	Benchmark: 75% of the students will earn a score of 90-100%.	YES	Eighty-seven percent of the students achieved 75% or better. 100% of those who did not reach the target score did not turn in the assignment. The average score for this assignment was 85%.	No action is required

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 Internet Programming: JavaScript/Ajax

	Benchmark	Criterion Met	Results	Action
SLO 01	JavaScript program with a form and registered event listeners that process form input. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion	No action is required
SLO 02	Students must describe in their own words the DOM and its relationship to object-based programming. 75% of the students will meet or exceed this criterion.	YES	84.6% of the students met the criterion.	No action is required
SLO 03	Students write an application to create a cookie with a specified lifetime and retrieve cookie contents for customized display.	YES	92.3% of the students met the criterion.	No action is required

	75% of the students will meet or exceed this criterion.			
SLO 04	Ajax program that uses PHP on the server side to retrieve stock quotes. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion	No action is required
SLO 05	Students create a JavaScript application that fetches iTunes RSS feeds and displays information about albums in different musical genres. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion	No action is required
SLO 06	Exam question about MV* design patterns. 75% of the students will meet or exceed this criterion.	YES	93.75% of the students met the criterion.	No action is required
SLO 07	Create employee directory app using Backbone.js and Twitter bootstrap. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion.	No action is required

Evidence shows that students who read the assigned material and complete the assignments are nearly 100% successful in achieving the student learning outcomes. One issue that continues to be problematic is that many students are working full-time and do not devote adequate time to the reading and programming assignments. Students who have a high grade in the class (A or B) will drop the class when they realize that they don't have adequate time to devote to class work. However, some students feel that they have "purchased" the class and do not participate at all. When dropped from the class for lack of participation, they often complain that they should not have been dropped despite the fact that they have not logged into WebAccess for many weeks or responded to repeated emails. They will demand reinstatement in the class and often complain to the Registrar and/or the Dean. This skews the results for success.

CIS 125 Individual SLOs' Results and Assessment

	Benchmark	Criterion Met	Results	Action

SLO 02	75% of the students will earn a score of 90-100%.	YES	Eighty-three percent of the students achieved 75% or better. The average score for this assignment was 92%.	No action is required
SLO 03	75% of the students will earn a score of 90-100%.	NO	Sixty-six percent of the students achieved 75% or better. The average score for this assignment was 86%.	Rewrite the lab for better clarity. Assign additional video covering this topic.
SLO 05	75% of the students will earn a score of 90-100%.	YES	Eighty-two percent of the students achieved 75% or better.	No action is required

CIS 254 Intro to Object-Oriented Program Design

	Benchmark	Criterion Met	Results	Action
SLO 01	Students must trace program code and give expected output with an explanation of code behavior. 75% of the students will meet or exceed this criterion.	YES	86.6% of the students met the criterion.	No action is required
SLO 02	Students create a program using conditional statements and loops. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 03	Students must debug an entire program, documenting all bugs found with their corrections. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 04	Students create a program with an array populated with random numbers. 75% of the students will meet or exceed	YES	100% of the students completing the	No action is required

	this criterion.		lab met the criterion.	
SLO 05	Students create a Rectangle class modeling the concept of a rectangle. Students also create a test program. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 06	Students write a test program for a given class, creating objects of the class and employing accessor and mutator methods. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 07	Students design a class with instance and static fields and methods; then write a test program to employ the methods. 75% of the students will meet or exceed this criterion.	YES	80% of the students met the criterion.	No action is required
SLO 08	Students must trace code, giving values of variables at different stages of program execution. 75% of the students will meet or exceed this criterion.	YES	84.8% of the students met the criterion.	No action is required
SLO 09	Students must explain in depth the concept of method overloading. Students must also describe how primitive and reference values are passed to methods. 75% of the students will meet or exceed this criterion.	YES	84.8% of the students met the criterion.	No action is required
SLO 10	Students use an existing class they created in a previous lab and add a toString method to override the Object class's version. Students must explain the relationship between their class and the Object class. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required

CIS 255 Programming Methods I: Java

	Benchmark	Criterion Met	Results	Action
SLO 01	Test questions about inheritance, encapsulation, polymorphism. 75% of the students will meet or exceed this criterion.	YES	90% of students answered these test questions correctly.	No action is required
SLO 02	Students design a class hierarchy based on UML class diagrams. 75% of the students will meet or exceed this criterion.	YES	84.6% of the students met the criterion.	No action is required
SLO 03	Students write an application using multiple classes consisting of 500-700 lines of code. 75% of the students will meet or exceed this criterion.	YES	92.3% of the students met the criterion.	No action is required
SLO 04	Students design an inheritance hierarchy. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 05	Students write a program employing various recursive methods. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the lab met the criterion.	No action is required
SLO 06	Exam question about sorting efficiency 75% of the students will meet or exceed this criterion.	YES	93.75% of the students met the criterion.	No action is required
SLO 07	Students use exception handling in a program performing file I/O. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion.	No action is required

SLO 08	Students create Javadoc comments for a medium-size program consisting of multiple classes. 75% of the students will meet or exceed this criterion.	YES	100% of the students completing the assignment met the criterion.	No action is required

CIS 278 Programming Methods I: C++

	Benchmark	Criterion Met	Results	Action
SLO 01	This SLO is assessed using a practical exam questions. 75% of the students will meet or exceed this criterion.	YES	91% of students answered these test questions correctly.	No action is required
SLO 02	This SLO is demonstrated with an assigned computer project. 75% of the students will meet or exceed this criterion.	YES	89% of the students met the criterion.	No action is required
SLO 03	This SLO is measured using a programming project. 75% of the students will meet or exceed this criterion.	YES	92% of the students met the criterion.	No action is required
SLO 07	This SLO is measured with a project focusing on a dynamic array. 75% of the students will meet or exceed this criterion.	YES	98% of the students completing the assignment met the criterion.	No action is required

CIS 279 Programming Methods II: C++

	Benchmark	Criterion Met	Results	Action
SLO 01	This SLO is assessed by completion of a non-trivial ADT class and application class. 75% of the students will meet or exceed this criterion.	YES	92% of the students met the criterion.	No action is required

SLO 02	This SLO is assessed on Exam 1. 75% of the students will meet or exceed this criterion.	YES	95% of the students met the criterion.	No action is required
SLO 03	Final exam question is used to assess this SLO. 75% of the students will meet or exceed this criterion.	YES	89% of the students met the criterion.	No action is required
SLO 04	This SLO is assessed on Exam 3. 75% of the students will meet or exceed this criterion.	YES	90% of the students met the criterion.	No action is required

Additional Assessment

ISSUES	PROPOSED SOLUTIONS
Inability to develop and test MAC materials.	Get instructor a MAC to use (in addition to her PC).
Delayed funding for texts of Vets and financial aid students.	Perhaps the college can float these students a short term loan for such things as access to Publishers' Websites.
Life-long learners don't typically regard the grade as important.	The stats for CTE classes are often skewed because of a high percent of life-long learners. Nothing to do for this.

2. Comment on the success rates in the program SLOs that are aligned with specific course SLOs. What do the program SLO and course data reveal about students completing the program? Identify trends and discuss areas in need of improvement. Is the alignment between course and program SLOs appropriate and informative? See **course-to-program SLO alignment mapping**.

DEGREE mapping of course SLOs

The CIS department has Objectives and SLOs for it A.S. degrees as shown below. The class SLOs listed above are mapped into the A.S. degree SLOs. Courses 110, 114, 125, 254, 255, and .x have been assessed and action plans made where necessary

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.

CIS 114 SLOs 1, 4, 7 -- CIS 254 SLOs 2, 4, 5 -- CIS 255 SLOs 3, 4 -- CIS 278 SLOs 4, 5 -- CIS 256/279 SLOs 5, 6, 7

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 programming languages.

CIS 114 SLOs 1, 4, 5, 7 -- CIS 254 SLOs 2, 9 -- CIS 255 SLOs 4, 5 -- CIS 278 SLOs 4, 5 -- CIS 256/279 SLOs 5, 7

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.

CIS 110 SLOs 1, 2, 3, 4 -- CIS 114 SLO 7

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.

CIS 110 SLOs 1, 5, 6 - CIS 255 SLO 8 -- CIS 256/279 SLO 8

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.

CIS 114 SLO 7 -- CIS 254 SLO 5 -- CIS 255 SLO 2, 8 -- CIS 278 SLOs 4, 5 -- CIS 256/279 SLOs 5, 7

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.

CIS 254 SLO 5 -- CIS 255 SLO 8 -- CIS 256/279 SLO 8.

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

CIS 110 7

3. Evaluate the program SLOs in relation to survey data from the degree and certificate award earners survey. What does the survey data reveal about the effectiveness of the program SLOs? Identify trends and discuss areas in need of improvement.

STUDENT SURVEY RESULTS

One hundred percent of CIS certificate students who took the survey “Agree” or “Strongly Agree” that their CIS experience was positive and productive.

Java Programming Certificate of Specialization

One hundred percent of students polled “Agree” or “Strongly Agree” that the program successfully helped them to prepare for their career and next academic goals.

Students are also in agreement that they could effectively write and speak because of their experience in the CIS program. One hundred percent of students agreed that they can comprehend, interpret, and analyze information read; assess the legitimacy of different types of information; comprehend a variety of numerical or quantitative calculations, including graphs and charts; effectively work with diverse backgrounds; and identify ethical issues and evaluate their consequences.

C++ Programming Certificate of Specialization

One hundred percent of students polled “Agree” or “Strongly Agree” that the program successfully helped them to prepare for their career goal and their next academic goal.

Students are also in agreement that they could effectively write and speak because of their experience in the CIS program. One hundred percent of students agreed that they can comprehend, interpret, and analyze information read; assess the legitimacy of different types of information; comprehend a variety of numerical or quantitative calculations, including graphs and charts; effectively work with diverse backgrounds; and identify ethical issues and evaluate their consequences.

CIS Applications & Development Certificate of Achievement

One hundred percent of students polled “Agree” or “Strongly Agree” that the SLOs surveyed for this Certificate were met. Of these students, 83% out of the 100% “Strongly Agree” the SLOs were met.

SLOs Surveyed

1. Communicate effectively orally, in writing and in media
2. Create and debug code for given specifications and write appropriate documentation
3. Demonstrate a comprehensive understanding of one or more computer programming languages
4. Demonstrate proficiency in using data analysis and data management tools.
5. Demonstrate proficiency in using one or more internet programming languages to design and implement a web based program
6. Work collaboratively and ethically in teams on projects

CIS Computer & Information Science A.S. Degree

One hundred percent of students polled “Strongly Agree” that the SLOs surveyed for this certificate were met.

SLOs Surveyed

1. Communicate technical concepts both in writing and orally
2. Construct reliable, robust object oriented solutions to problems involving the storage, retrieval and update of large quantities of data.
3. Demonstrate proficiency in one or more computer programming languages.
4. Implement, test and debug a medium-size computer program that is stylistically and functionally correct, based on an object-oriented design model.

Java Programming Certificate of Specialization

One hundred percent of students polled “Agree” or “Strongly Agree” that the SLOs surveyed for this Certificate were met.

SLOs Surveyed

1. Communicate and contribute code in a team software development project
2. Design and implement reliable, robust, object oriented Java solutions to medium sized problems which may involve the storage, retrieval and update of large quantities of data.

C++ Programming Certificate of Specialization

One hundred percent of students polled “Agree” or “Strongly Agree” that the SLOs surveyed for this Certificate were met.

SLOs Surveyed

1. Communicate and contribute code in a team software development project.
2. Design and implement reliable, robust, object oriented C++ solutions to medium sized problems which may involve the storage, retrieval and update of large quantities of data.

4. Describe any additional methods used to assess program SLOs and reflect on the results of those assessments.

The department communicates extensively via email on the growth and development of new and relevant programs for our students. We also attend multiple conferences and workshops to stay current with the field.

5. For any courses in the program that satisfy a GE requirement, which GE SLOs are supported or reinforced by the course SLOs? What do assessment results for the course SLOs reveal about student attainment of the GE SLOs? See **GE SLO Alignment Summary Report** or **All Courses GE SLO Alignment Data**.

CIS 110, 125, 135, 254, 255 and 278 satisfy the Communication and Analytical Thinking GE Area E2c. This aligns with the Effective Communication, Quantitative Skills and/or Critical Thinking GE SLOs. Assessment of the course SLOs that align with these GE SLOs indicate that the SLOs have been met.

CIS 135 was not offered 2013-14 and is being offered for the first time in spring 2015.

Effective Communication

SLO	Assessment	Action
CIS 110 SLO 4	The average score for this assignment was 85%.	No action required
CIS 125 SLO 5	82% of the students achieved 75% or better.	No action required
CIS 254 SLO 5	100% of the students completing the lab met the criterion.	No action required
CIS 255 SLO 3	84.6% of the students met the criterion.	No action required

Quantitative Skills

SLO	Assessment	Action
CIS 125 SLO 5	82% of the students achieved 75% or better.	No action required
CIS 254 SLO 10	100% of the students completing the lab met the criterion.	No action required
CIS 255 SLO 5	100% of the students met the criterion.	No action required
CIS 278 SLO 8	Not assessed	

Critical Thinking

SLO	Assessment	Action
CIS 110 SLO 7	The average score for this assignment was 85%.	No action required
CIS 125 SLO 5	82% of the students achieved 75% or better.	No action required
CIS 254 SLO 10	100% of the students completing the lab met the criterion.	No action required
CIS 255 SLO 8	100% of the students met the criterion.	No action required
CIS 278 SLO 8	Not assessed	\

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 overall college success rate has decreased slightly (1%) over the past three years. CIS over the past three years has increased its success rate by 9%. While the current success percentage of CIS (64%) still lags behind the college's (70%) the gap is closing at an average of 3% a year. The Business/Technology Division success rate has also increased over the past three years. It currently is 4% higher (74%) than the college. Retention has remain more or less steady for the college and the division since 2011, hovering around 84% and 85% respectively. CIS has shown a 4% increase in retention over the past three years. At 77% it is lower than either the college or divisions,

but like the success rate, it shows signs of improvement.

STUDENT SUCCESS INDICATORS	Academic Year		
	11-12	12-13	13-14
Success %	55%	60.3%	63.5%
Retention %	73.2%	74%	77.3%
Withdraw	26.8%	26%	22.7%

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

The college ratio of online classes to traditional is 40% to 60%. In CIS the ratio is higher at 53% online and 47% traditional with the latter typically hybrid or with a heavy web presence. The department success and retention rates roughly mirror the college wide numbers in the online delivery. There is one notable exception. CIS online courses have an 8% higher retention rate. This may be part because CIS students are more computer savvy and do not get discouraged when needing to navigate Moodle and other web-based assignments. It may also be CIS faculty are also more computer savvy and are able to better present material online.

COURSE	Distance	Traditional
CIS 110 %Success	62.9	63.5
%Retention	86.9	82.6
CIS 111 %Success	41.6	---
%Retention	58.2	---
CIS 114 %Success	37.5	---
%Retention	58.9	---
CIS 121 %Success	48.1	---
%Retention	67.0	---
CIS 125 %Success	42.9	---
%Retention	71.4	---
CIS 127 %Success	60.3	---
%Retention	70.6	---
CIS 151 %Success	56.0	---
%Retention	76.2	---

CIS 380 %Success	50.7	---
%Retention	62.7	---
CIS 479 %Success	83.3	---
%Retention	92.9	---
CIS 490 %Success	70.0	---
%Retention	70.0	---
CIS 491 %Success	86.7	---
%Retention	93.3	---

CIS 255/278 and CIS 256/279 are taught differently and require further explanation. These courses represent Computer Science I and II (CS1 and CS2), both are taught in computer programming languages Java and C++. CIS 255 (Java) and CIS 278 (C++) are the equivalent of CS1. CIS 256 (Java) and CIS 279 (C++) are equivalent to CS2.

Assessment data is pooled, then averaged. CIS 255/278 has a success rate of 64.2% when delivered in the distance mode, compared to 77.5% in the traditional mode. Retention is 74.65% for the distance mode compared to 77.5% in the traditional mode.

COURSE	Distance	Traditional
CIS 255 %Success	75.7	--
CIS 278 %Success	52.7	77.5
Average Assessment ----------	64.2	77.5
CIS 255 %Retention	83.8	--
CIS 278 %Retention	65.5	77.5
Average Assessment	74.65	77.5

Assessment data is again pooled then averaged for CIS 255/278. It has a success rate of 66.0% when delivered in the distance mode, compared to 94.1% in the traditional mode. Retention is 82.85% for the distance mode compared to 94.1% in the traditional mode.

COURSE	Distance	Traditional
CIS 256 %Success	67.7	94.1
CIS 279 %Success	64.3	--
Average Assessment ----------	66.0	94.1
CIS 256 %Retention	87.1	94.1
CIS 279 %Retention	78.6	--

Average Assessment	82.85	94.1

Because most CIS classes are taught in the DE mode the Success and Retention rates are best represented by the overall department's rates which are a Success of 63.5%. a Retention-percent of 77% and Withdraw percent of 22.7%.

STUDENT SUCCESS INDICATORS	Academic Year		
	11-12	12-13	13-14
Success %	55%	60%	63.5%
Retention %	73.2%	74%	77.3%
Withdraw %	26.8%	26%	22.7%

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.)

In 2013 both the Business/Technology Division LOAD (690) and the CIS Department LOAD (554) were higher than that of the college's (518). This translates to a division and department increase over the college at rates of 25% and 6% respectively. The CIS LOAD in 2014 shows a precipitous drop to 429. This is directly due to the phasing out of the Computer Forensics Certificate. If these single-digit enrolled classes are removed from the calculations the CIS 2014 LOAD is 526. The average class size is 31.

Finding faculty for CIS classes has grown increasingly difficulty. Over the past three years the college full-time to part-time ratio has decreased (4%). The CIS ratio has decreased much more sharply (13%). Additionally, adjunct faculty are extremely difficult to find. This is partly due to the plethora of Bay Area jobs available to an individual with a Master's degree in Computer Science. The discrepancy in salary between industry and education also contributes to the difficulty in finding instructors.

Percent Full-time	2011-2012	2012-2013	2013-2014
	65.5	55.3	48.6

3. Career Technical Education

D. 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.

Career Technical Education

"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). In 2007, the first report was published. Today, ARCC

provides data for 7 student performance indicators (credit programs) for the system and for individual colleges." -- CSM ARCC Fast Facts

The CSM Fast Facts continues to say that in the *Spring 2012 Report CSM*, in most cases, compared favorably to the state averages on the 7 student performances measured. The Vocational Course Completion, which encompasses 65% of the CIS department courses, shows that CSM is at 78.8%, a 2.1% increase over the state average.

	State Rate	CSM Rate	Difference
Student Progress & Achievement	53.6%	58%	+4.4
Completed 30 or More Units	73.5%	75.2%	+1.7
Fall to Fall Persistence	71.3%	76.5%	+5.2
Vocational Course Completion	76.7%	78.7%	+2.1
Basic Skills Course Completion	62.0%	59.5%	-2.5
ESL Course Improvement	64.6%	52.5%	-12.1
Basic Skills Course Improvement	58.6%	60.2%	+1.6

On the PRIE External Community webpage, there is a document representing the *Top 50 Regional Occupations*. The table below provides a partial listing of the top 50 occupations located in the 5-County Bay Region, consisting of Alameda, Contra Costa, San Mateo, Santa Clara, and San Francisco counties. The occupational data includes the number of jobs in 2011; the projected number of jobs in 2017; the percent growth in jobs 2011 – 2017; and the annual number of openings projected 2011 – 2017; and the average hourly wage in 2012. The top eight occupations with the highest percent change are shown.

Computer Specialists come in eighth for percent of change at 17%. More importantly, the report shows there will be over 8000 annual openings with a high hourly wage of $46.76. This has prompted the district to organize meetings with the District's computer science faculty. This group is assisted by an external consultant to establish a list of skills a Computer Specialist needs and how the current computer classes map into these skills. The District is also funding the exploration of local businesses to survey their needs in this area.

	Description	2011 Jobs	2017 Jobs	% Change	Annual Openings	2012 Avg Hourly wage
1	Librarians, Curators, and Archivists	6,294	7,878	25%	515	$29.09
2	Nursing, Psychiatric, and Home Health Aides	37,300	45,345	22%	1,731	$13.84
3	Life Scientists	14,562	17,507	20%	864	$46.17
4	Other Personal Care and Service Workers	97,041	114,554	18%	5,199	$12,12

5	Other Teachers and Instructors	37,452	44,029	18%	1,689	$22,32
6	Financial Specialists	130,452	152,643	17%	5860	$38.58
7	Sales Representatives, Services	76,643	89,597	17%	4,275	$33.68
8	**Computer Specialists**	**182,792**	**213,453**	**17%**	**8,189**	**$46.76**
…	……..	…	…	…	…	…
50	Primary, Secondary, and Special Education School Teachers	71,859	75,142	5%	2450	$27.66

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. The last meeting was April 24, 2014. It is typically well-attended and has the following distinguished members:

Advisory Members	Company
Zach Brown	Hitachi
Tom Burre	Appirio
Greg Doolittle	Apple
Moshe Gotesman	Google
Chris Heckart	IBM
Sandy Jones	Los Medanos College
Stormy Maddox	Information Security Office San Mateo County
William Paoli	Atlassian
Cory Putnam	Intuit
Josephine Wong	Intuit
Ex-Officio Members	
Kathy Ross	Dean Business and Technology
Ron Brown	CIS Faculty (Retired)
Stacey Grasso	CIS Faculty
Melissa Green	CIS Faculty

Zorigt Bazarragchaa	Instructional Aide II/CIS
Martha Tilmann	CIS Faculty
Stanley Isaacs	CIS Faculty (adjunct)

4. 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.

Demographics

The CIS student demographics mirrors that of the college in the area of Ethnicity. Approximately 30% White, 20% Asian, and 13-15% Hispanic. The dominant college age range is between 20-24 with “19 or less” a close second. Eighty-one percent of all students at CSM are under the age of 30. CIS has fewer students in the under 30 group (69%) and more in the over 50 (14% verses college’s 11%). Younger students are found in the fundamental classes that full fill GE requirements, and in the transfer core courses. CIS is substantially different from the college in the area of gender. CSM students are 55% female and 43% male, a near 1 to 1 ratio. In CIS there is a 1 to 4 female to male ratio. This reflects a cultural and social bias against women in science and technology. It may be an issue the department will look at in 2014-2015.

Transfer Issues

Somewhere in a CIS Program Review, one would expected to find a discussion on transfer success, but that is not possible because the Business/Technology Division is categorized as 100% CTE. This means, for CIS, Key Indicator columns like “% Transferable” and “% Degree Applicable” come up as 0% for CIS, which is completely inaccurate. CSM has an outstanding transfer core curriculum that is accepted at nearly all of the four year universities students attend when leaving (UC Berkeley being the exception). CSM’s CIS transfer program stands stellar in the District. Skyline doesn’t offer this curriculum and Canada has a difficult time staying current in the field. Canada students who transfer to CSM in CIS typically arrive underprepared. Categorizing CIS as 100% CTE leads to three issues: all department data is inaccurate and skewed; it does not recognize the CIS faculty for their contributions in this area; finally and perhaps most importantly, it does not give the department tools to assess and improve the curriculum based on real data.

State-wide Initiative 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.

Generally Speaking

Additional factors that affect the CIS department and students include:

1. Students are often underprepared 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.

4. By design, advanced, more specialized courses are often taught by industry professionals who can offer a 'real world' flavor to the material. The difficulty is finding good technical adjunct willing to teach.

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

5. Planning

A. Results of Program Plans and Actions

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

1. Learn ***iOS/Swift Programming*** and develop a new ***iOS/Swift Programming*** online course

DESCRIPTION
Swift Programming language is a new programming language for iOS and OS X apps that builds on the best of C and Objective-C, without the constraints of C compatibility. and software environment for statistical computing. Swift is widely used among apple developers and is an essential skill for web developers. A course in this technology will greatly enhance the *Web and Mobile Application Development* AS and certificate offerings in the CIS curriculum. Professional development will be needed to learn Swift and develop a new course was approved in spring 2016.

MEASURABLE OUTCOMES
The faculty will have enrolled and completed a course in iOS/Swift Programming. The official Course Outline and supporting materials will have been submitted and approved by COI.

2. Develop a new ***R Programming*** online course to be taught by adjunct faculty

DESCRIPTION
R is a programming language and software environment for statistical computing. The R language is widely used among statisticians and data miners for developing statistical software and data analysis. R's popularity has increased substantially in recent years. A course in this technology will greatly enhance the Database Programming Certificate of Specialization in the CIS curriculum.

MEASURABLE OUTCOMES
The official Course Outline and supporting materials will have been submitted and approved by COI.

3. Research the development of a "Big Data" Certificate of Specialization.

DESCRIPTION
Ninety percent of the world's data has been created in the last two years. Managing and gaining insight of this data is paramount. **Big data expands IT's scope of responsibility with new data types, new methods of analysis, new storage and processing platforms. Exploration of topic should determine if it is appropriate to consider for the CIS curriculum. This will be discussed at the annual CIS Advisory Committee meeting.**

MEASURABLE OUTCOMES
A decision on whether the department should pursue this as a line of study at CSM.

B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the **College Mission and Diversity Statements**, **Institutional Priorities, 2013/14-2015/16**, and other **Institutional Program Planning** as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success

indicators.
[**Note**: Specific plans to be implemented in the next year should be entered in C of the Planning section.
CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

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 started with an extensive survey of local businesses, mostly by Skyline faculty. Small business assessment focused 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 were led by a Skyline faculty on paid leave funded by the District. Interviews were conducted in person, at business workplaces.

Based on interview results, a list of required skills was developed. The assumption is that many program components exist throughout the colleges and can easily be formed/reformed based on skills needed.

All CSM CIS faculty are involved in this work, but at this time no one has release time. CSM CIS faculty have been included as a resource, but not asked to participate beyond this.

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 in particular, women.
- 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 activities that would be most effective in carrying out the program's vision to improve student learning and success.

Two, perhaps three, professional development proposals will be needed to complete the work described here. Because applications for

professional development are due so early in the semester, it is difficult to know what courses are available at other colleges since they have not yet published their schedules for the following semester. This makes it hard to predict the exact training an applicant would undergo for professional development. Additionally, it would be helpful to have travel money for conferences.

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 purpose of the CIS Computer Lab 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 Lab is now forced to close at 4:30 PM Monday through Thursday due to the fact that there is no evening lab supervisor. In the past the lab closed at 8:00 PM or later. This has created a hardship for many students. The Learning Center no longer supports current CIS software and the only option for students is to use the Business Lab in the evening. The Business Lab is open Tuesday, Wednesday, and Thursday evenings. Unfortunately there are no lab assistants familiar with CIS software or programming languages in the Business Lab. Additionally, students from Architecture, Drafting and Engineering who normally use our lab are not accommodated anywhere else and thus cannot complete their work in the evening.

The CIS Computer Lab is available to all CSM students, but priority is given to CIS, Architecture, Drafting, and Engineering students. Four CIS courses and one Engineering course, several with multiple sections, have regularly-scheduled lab sessions in the CIS Computer Lab, while an additional twenty-two CIS courses use the Computer Lab. Two Architecture, four Drafting, and three Engineering courses use the lab on a regular or occasional basis. All CSM students may use the lab, 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 Lab is also used by the Nursing program for online exams several times per semester. Business students also use the CIS Computer Lab.

By offering this resource and by measuring student learning outcomes, the CIS Computer Lab serves to improve retention in CIS as well as other courses. The CIS Computer Lab 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, Drafting, Engineering and Architecture students use the lab to work on projects and homework in an environment where they can frequently interact with faculty or the instructional aide for assistance. The forced evening closure of the lab has had a deleterious effect on students and faculty alike. There have been numerous student complaints about this closure.

Engineering classes also have regularly-scheduled meetings in the lab. Although other departments do not have regularly-scheduled labs, students in Architecture and Drafting classes use the lab to complete assignments and/or the hour(s) by arrangement requirement. Those departments will occasionally reserve the lab for special sessions.

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

Other CIS courses with students using the CIS Computer Lab are
CIS 110, 111, 113, 114, 117, 121, 125, 127, 128, 132, 135, 151, 255, 363, 364, 379, 380, 420, 479, 489, 490 and 491. Students in the online sections of CIS 110, 254, 255, 256, 278, and 279 also use the Computer Lab.

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

Drafting courses using the Computer Lab are DRAF 110, 111, 121, and 122.

Engineering courses using the Computer Lab are ENGR 100, 210 and 215. Engineering 210 has regularly-scheduled meetings in the lab, as well as required hours by arrangement.

In addition, the Engineering Club 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).

A survey administered to students in 2014 asked the following question:
To what extent did your work in this Center help your academic performance in courses linked to the Center or supported by the Center?

68.8% of students answered that the lab was very helpful. 28.1% of students said that the lab was somewhat helpful. Only one student found the lab not helpful.

When asked about achievement of each of the 12 Computer Lab learning objectives, from 66.7% to 93.4% of students responded that they have made major or moderate progress.

The profile of students using the CIS Computer Lab show that they are ethnically diverse but overwhelmingly male (67.7%). 83.3% are age 24 or younger; 50% have a GPA of 3.0 or higher while 39.6% have a GPA of 2.0-2.9. 39.4% of students are enrolled in both day and evening classes, while 54.2% are day-only students. 99.4% are transfer students.

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

See the Resource Requests section below to enter itemized resource requests for next year.
Leave sections blank if no major changes are anticipated.

Faculty

The CIS Department will be requesting a new full-time faculty position in 2015-2016

Finding faculty for CIS classes has grown increasingly difficulty. Over the past three years the college full-time to part-time ratio has decreased (4%). The CIS ratio has decreased much more sharply (13%). Additionally, adjunct faculty are extremely difficult to find. This is partly due to the plethora of Bay Area jobs available to an individual with a Master's degree in Computer Science. The discrepancy in salary between industry and education also contributes to the difficulty in finding instructors. The new online A.S. degree in Web and Mobile Application Development effective fall 2015 will increase enrollment and the loss of our longtime adjunct instructor in this area is a cause for concern because there is an absence of qualified applicants to our part-time pool.

Percent Full-time	2011-2012	2012-2013	2013-2014
	65.5	55.3	48.6

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 ARCH, CIS, ENGR, DRAF, BUSW students. There are 45 desktop computers and 2 printers in the lab. All 45 desktop computers and 1 printer will need replacement within the next two years.

Additionally, each faculty member 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 two years. New Lego Mindstorms robots are no longer compatible with Lejos Java so the robots would need to be replaced with a different type of robot.

Classified Staff

In November 2013 the CIS department hired a new Computer Lab Instructional Aide. He left in October 2014. This position was not posted again on the HR site until March 2015. This void has affected the department's ability to provide an effective working space for our students. Instructors have also been negatively impacted by the lack of an Instructional Aide. The CIS Instructional Aide is responsible for planning

and coordinating the annual Advisory Board meeting. Without an Instructional Aide no meeting can be held.

Facilities

Because of the pending new B19, all previous facilities requests are tabled.

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the **Institutional Priorities, 2013/14-2015/16**. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

The department priority for this year as follows:

1. Learn ***iOS/Swift Programming*** and develop a new ***iOS/Swift Programming*** online course

See DESCRIPTION 5.Planning A

2. Develop a new ***R Programming*** online course to be taught by adjunct faculty

See DESCRIPTION 5.Planning A

3.Research the development of a "Big Data" certificate of specialization.

4. Implement the "Action" items resulting from the SLO assessments.

6. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

NOTE: To make a faculty position request, complete **Full-time Faculty Position Request Form** and notify your Dean. This request is separate from the program review.

The CIS Department will be requesting a new full-time faculty position in 2015-2016

Finding faculty for CIS classes has grown increasingly difficult. Over the past three years the college full-time to part-time ratio has decreased (4%). The CIS ratio has decreased much more sharply (13%). Additionally, adjunct faculty are extremely difficult to find. This is partly due to the plethora of Bay Area jobs available to an individual with a Master's degree in Computer Science. The discrepancy in salary between industry and education also contributes to the difficulty in finding instructors.

Percent Full-time	2011-2012	2012-2013	2013-2014
	65.5	55.3	48.6

Equipment and Technology

Description	Cost
Faculty computer upgrades - PCs	$4000
Faculty - one MAC	$1000
Web server to support new Web and Mobile Application Development curriculum	$2000

The CIS Computer Lab has 45 desktop computers and one printer that will need replacement within the next two years.

Instructional Material

Description	Cost
Replacement robots	$10,000

Classified Staff

Instructional Aide II

[this position has already been approved]

The CIS Computer Lab is currently without an Instructional Aide II. This negatively effects the department's operations in may ways. It also negatively effects CIS students on a daily basis. An aide was hired last year, but has now left. This request is to replace him. The position has already been approved.

Description of Position

This is paraprofessional work at the action level that involves assisting faculty in the delivery of classroom instruction and/or laboratory teaching. Under direction, the employee performs a variety of preparatory work and planning, and at the faculty direction prepares materials for use in the classroom and/or laboratory. Public contact is extensive and primarily includes students, College faculty and staff, but can also include vendors and staff in other educational institutions and agencies, for the purpose of exchanging subject matter and procedural information. A high degree of independent judgment and creativity is required to resolve a wide variety of minor and occasional major problems that may arise. Consequences of errors in judgment can be moderately costly in public relations and employee time; however, supervisory controls are available to limit the risk of serious error. An Instructional Aide II differs from Instructional Aide I by the scope of assignments, including tutoring responsibilities, and level of required subject-matter expertise. An Instructional Aide II can perform a wide variety of classroom and laboratory duties within the scope of the classification. An Instructional Aide II can direct the work of student assistants, other clerical staff and Instructional Aides I, as assigned.

6 part-time Computer Lab 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.

None.

7. Program Maintenance

A. Course Outline Updates

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

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

Degrees/Certificates to UPDATE	Faculty Contact	Action	Submission Date
AS: Computer and Information Science	Grasso	No Action	----
AS: Web and Mobile Application Development (NEW)	Green	No Action	updated fall 2014
AS: Computer Science Applications and Development	Grasso	No Action	updated fall 2014
CA: Web and Mobile Application Development (NEW)	Green	No Action	updated fall 2014
CA: Computer Science Applications and Development	Grasso	No Action	updated fall 2014
CS: Web and Mobile Application Development (NEW)	Green	No Action	approved fall 2014
CS: Internet Programming	Green	No Action	updated fall 2014
CS: Database Programming (NEW)	Green	No Action	approved fall 2014
CS: C++ Programming	Grasso	No Action	----
CS: Java Programming	Grasso	No Action	----

Courses to UPDATE		Faculty Contact	Submission Date
CIS 110	INTRODUCTION TO COMPUTER AND INFORMATION SCIENCE	Tilmann	Fall 16
CIS 111	INTRODUCTION TO INTERNET PROGRAMMING	Green	Fall 16
CIS 113	INTERNET PROGRAMMING: RUBY	Green	Fall 16
CIS 114	INTERNET PROGRAMMING: JAVASCRIPT/AJAX	Green	Fall 16
CIS 117	INTERNET PROGRAMMING: PYTHON	Green	Fall 16
CIS 121	UNIX/LINUX	Tilmann	Fall 16
CIS 125	VISUAL BASIC I	Tilmann	Fall 16
CIS 127	INTERNET PROGRAMMING: HTML5 and CSS	Green	Fall 16
CIS 128	MOBILE WEB APP DEVELOPMENT	Green	Fall 16
CIS 132	INTRODUCTION TO DATABASES	Green	Fall 16
CIS 135	ANDROID PROGRAMMING	Green	Fall 15
CIS 151	NETWORKS AND DIGITAL COMMUNICATION	Tilmann	Fall 16
CIS 200	CAPSTONE PROJECT - CIS	Green	Fall 16
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 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 15
CIS 364	ENTERPRISE DATA	Green	Fall 15

	WAREHOUSING		
CIS 379	INTERNET PROGRAMMING: XML	Green	Fall 16
CIS 380	INTERNET PROGRAMMING: PHP	Green	Fall 16
CIS 420	PROJECT MANAGEMENT PROFESSIONAL CERTIFICATE PREPARATION	Grasso	Fall 16

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: 12/14
Michelle Schneider (Division input person)	Updated as needed.

C. SLO Assessment Contacts

Faculty contact(s)	**Date of next review/update**
Melissa Green	Spring 16, Ongoing
Stacey Grasso	Spring 16, Ongoing
Martha Tilmann	Spring 16, Ongoing
Jennifer Taylor-Mendoza, Dean, Academic Support	Ongoing