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EL CAMINO COLLEGE

2015 Program Review
For the
Business Division's
Computer Information Systems Department

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1a) Description of the program, and the program's mission statement

At the core of Computer Information Systems (CIS) is a business-related focus that requires us to teach students many technologies so they will be able to decide which technology is the best to solve different business problems.

With technology life cycles measured in months instead of years, the very nature of CIS is also always rapidly changing. For this reason our department adds to, or updates curriculum as rapidly as possible to include cutting edge technology. Whereas we taught programming using punched cards many years ago, for example, we now teach mobile apps creation on portable devices like tablet computers and smart phones.

With the ever growing dependence on computer technology within companies of all sizes, the demand for skilled candidates has caused enrollments in CIS to expand accordingly.

We recognize that our department primarily serves two different types of students: Those seeking to fulfill general education requirements in order to obtain degrees or transfer to other educational institutions, and those who already have degrees who are trying to obtain new, or enhance, existing skills. Our program strives to meet the educational needs of all of our students by offering comprehensive instruction which can lead to a degree or certificate of achievement, career placement or advancement, and transfer of lower level courses to four-year universities.

1b) Degrees/certificates offered

Computer Information Systems is one of many programs that may be pursued by students wishing to obtain an Associate in Science degree.

Additionally, El Camino College also offers a variety of certificates. A Certificate of Achievement is recorded on a student's transcript. A Certificate of Accomplishment is not recorded on the transcript. Each of the programs requires completion of courses in a particular field. Unlike degree programs, courses outside the field are not generally required. The Computer Information Systems department currently offers two Certificates of Achievement, but several others are in development (see section 3f).

Students may expand any of the certificates into an Associate in Science (A.S.) degree by taking the required general education units and recommended courses from the certificate areas.

A detailed description of the CIS degree, and each of the current certificates are described next. Those certificates waiting approval by the College Curriculum Committee or in development by the Computer Information Systems department can be found in section 3f.

Computer Information Systems A.S. Degree

The CIS A.S. Degree is intended for students interested in careers in Information Systems. A variety of courses enable students to develop a wide breadth of knowledge and skills in Information Technology, including the ability to design and develop business software and graphical user interfaces, perform systems analysis, develop Web pages, spreadsheets, and databases, and implement and maintain LANs (local area networks). The degree leads to career opportunities as software specialists, Web programmers, database developers, systems analysts, and network administrators among other job specialties. The curriculum of the CIS program is designed to provide various levels of competency. The degree offers four concentrated areas of study:

- Help Desk – tailors education to computer user support
- Advanced Applications: tailors education to mastering business office computer systems
- Networking: tailors education to computer support and networking
- Programming: tailors education to computer, web, and mobile programming

The degree and many of courses within the degree are accepted and transferrable to CSU colleges.

- CIS 13 (Computer Information Systems), is accepted for transfer as a "pre-major" course for business administration majors at many California State University locations including Dominguez Hills (business administration and computer science majors), Fullerton, Long Beach, Los Angeles, Northridge, San Jose as well as University of California, Riverside, Mount Saint Mary's College, and California State Polytechnic University, Pomona.

- California state University, Dominguez Hills accepts CIS 16 (Application Development and Programming Using Visual Basic.Net), CIS 133(Mashup JavaScript, jQuery and AJAX) and 134 (ASP.NET with C# Business Web Programming) for transfer for their "Information Systems Concentration" of their Business Administration major, and CIS 13 and CIS 16 as "pre-major" courses for their "Computer Technology Concentration" of their Business Administration major.

The El Camino College Computer Information Systems Major Requirements are:

Computer Information Systems 13, 18, and 19

One course from the following groups:

- Computer Information Systems 26 and 28
- Computer Information Systems 140 and 141;

One of the following groups of courses:

- Help Desk: Business 27, Computer Information Systems 11, 40

- Advanced Applications: Computer Information Systems 27, 29, 80
- Networking: Computer Information Systems 40, 142, 143
- Programming: Computer Information Systems 16, 133, 134
- Mobile and Web Programming: Computer Information Systems 30, 133, 134, 136

Total Units: 24-26

Existing Certificates

Computer Systems Applications Certificate of Achievement

The Computer Systems Applications Certificate of Achievement is intended for students interested in entering and/or advancing in the workplace, or as a starting point for an A.S. degree. The certificate offers a broad background of study options, from business software to programming essentials to help students meet their goals.

To earn this certificate, a minimum of 12 Computer Information Systems units must be completed at El Camino College and a grade point average of 3.0 (B) is necessary.

Courses required
Computer Information Systems 13, 18, 19, 26, 28;

One course from:
- Computer Information Systems 16
- Computer Information Systems 133

Two courses from:
- Computer Information Systems 27
- Computer Information Systems 29
- Computer Information Systems 80
- Computer Information Systems 134
- Computer Information Systems 136

Two courses from:
- Computer Information Systems 11
- Computer Information Systems 30
- Computer Information Systems 40
- (or substitute any course above that was not selected)

Total Units: 30-35

Computer Support and Network Management:

The Computer Systems Applications Certificate of Achievement is intended for students interested in careers as technical specialists in any computer support field including local area network administration and Internet management. This program is built with a focus on Cisco, one of the most influential names in networking today.

A minimum of 12 Computer Information Systems units must be completed at El Camino College and a grade point average of 3.0 (B) is necessary.

Courses required
Computer Information Systems 13, 19, 40, 140, 141, 142, 143

Three courses from:

- Computer Information Systems 11
- Computer Information Systems 16
- Computer Information Systems 18
- Computer Information Systems 28
- Computer Information Systems 80
- Computer Information Systems 133

Total Units: 30-32

Note: Of the two certificate programs offered, it was recently discovered that only one certificate, the Computer Systems Applications Certificate of Achievement, was approved by the Chancellor's office. Curriculum changes (noted in section 3f) are addressing this area of concern.

Certificates waiting for College Curriculum Committee approval

Section 3f discusses the current CIS degree and Certificates already in the curriculum process.

Certificates currently in development

Section 3f discusses the future plans for CIS degree and Certificates.

1c) How does the program fulfill the college's mission and aligns with strategic initiatives

The CIS department has a positive impact on our student's lives by, among other things, continually reviewing, modifying and adding to our curriculum new certificates and courses that teach the current information technology skills that employers in our area are looking for.

As for the strategic initiatives of student learning, student success & support, collaboration, community responsiveness, institutional effectiveness, and modernization we:

1. Effectively partner with the Special Resource Center to help our students with disabilities (strategic initiative B; strengthen quality educational and support services to promote student success).
2. Provide open labs with tutors five days a week with hours throughout the day and night where students can receive extra help (strategic initiative A; enhance teaching to support student learning using a variety of instructional methods and services).
3. Work closely with our advisory board to receive feedback on the skills that are currently in demand by local employers (strategic initiative D; develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the workforce training and economic development needs of the community).
4. Articulate courses with local California State, University of California, and private colleges whenever possible (strategic initiative D; develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the workforce training and economic development needs of the community).
5. At a minimum adhere to the timelines in assessing and revising (when needed) our SLOs and PLOs. Some semesters we have assessed every SLO in every course offered whether they were due on the timeline or not (strategic initiative E; improve processes, programs, and services through the effective use of assessment, program review, planning, and resource allocation).
6. Follow a three year cycle of upgrading our technological resources (strategic initiative F; support facility and technology improvements to meet the needs of students, employees, and the community).

1d) Status of recommendations from the prior Program Review

Listed below are the six "prioritized" recommendations from the 2011 CIS Department Program Review along with their status:

1. Hire one full-time faculty member per year for the next three years.
    - Status: Ongoing

The CIS Department applied to hire a full-time faculty member each of the last three years. We received authorization from administration twice, and each time hired a new full-time tenure track professor.

2. Obtain funding to train existing staff on the new technologies, hardware and software platforms that will form the basis of future concepts that will be taught in our constantly changing field.

   - Status: Ongoing

     Every year the CIS Department obtains the services of multiple trainers who have demonstrated to approximately ten clerical and thirty staff employees:

     a. Distance education presentation methods
     b. Multimedia software
     c. Social media
     d. The enhancements available in Microsoft's newest office suites
     e. New software that can be used in the classroom
     f. CISCO concepts and teaching methods

3. Status: Ongoing
   Continue to adhere to the three year cycle of upgrading the resources within our computer labs.

   - All hardware/software/facility needs and upgrades were carefully planned and addressed before the CIS Department moved into the new MBA (Math-Business-Allied Health) building in the spring semester of 2013.

4. Status: Completed
   Reestablish the CIS Advisory Committee who would help provide input on course, certificates, and curricula as well as insight into local job markets and job requirements.

   - The department re-formed a CIS Advisory Committee in 2013, and has met with them annually for the last three years. Their input has been invaluable in helping to update old courses, and shape new curriculum.

5. Status: Ongoing
   Develop new courses, or revitalize existing curriculum to cover newer technologies that are of interest to employers and our students.

   - Aided by the input of our Advisory Committee and our own research on current trends we have:
     a. Developed a programming class for mobile applications
     b. Developed an Office Applications course that includes necessary topics that are no longer covered in either CIS 13 or BUS 52 A/B
     c. Completed the
        1) Business Programming certificate

2) Computer User Support Specialist certificate

d. Started development on a
   1) Small Business Technical Support certificate
   2) Database Management certificate
   3) The revision of CIS 40 (Personal Computer Operations) to include general PC maintenance, setting up small networks (LAN's), data backups and security
   4) Business Information Worker certificate
   5) CISCO Networking certificate

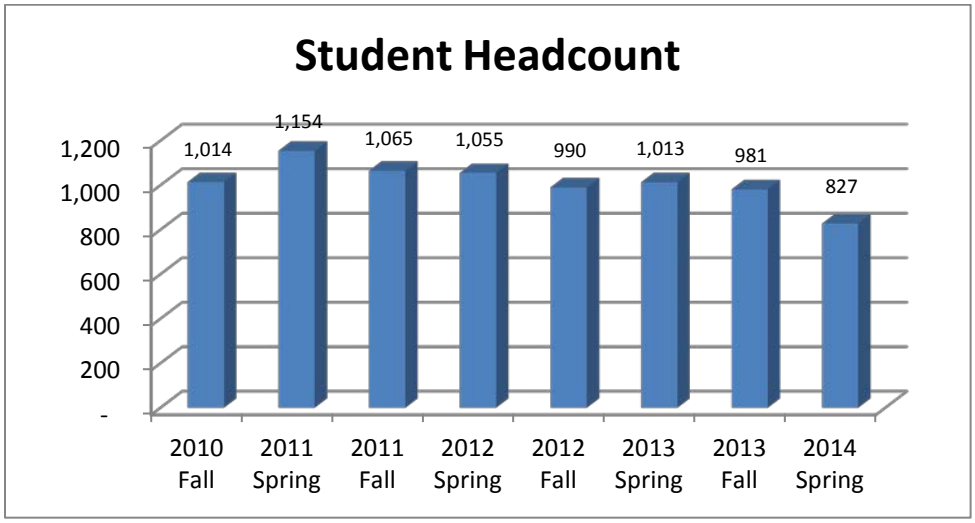
6. Status: Ongoing
   Continue the recruitment of knowledgeable information technology employees from local companies as part-time instructors.

   - Through our professional and personal contacts, the CIS Department continually seeks current full time professionals who can bring relevant experience to the classroom. This has proved to be beneficial, but difficult as well as most computer professionals are aware that their skills command a much higher salary then what they would earn teaching part-time.

2. Analysis of Institutional Research Data

2a) Head count of students in the program

The chart below indicates the student headcount numbers from fall 2010 through spring 2014. 981 (Fall 2013) represents 4.2% of the total El Camino College population, while the 827 (Spring 2014) represents 3.6% of the total El Camino College population. New math and English prerequisites for CIS 13 that went into effect during the 2014 spring semester caused a drop in headcount as a number of students had not met the criteria for enrollment.



2b) Course grade distribution

The spreadsheet below indicates the distribution of grades from fall 2010 through spring 2014

Grade Dist	A		B		C		D		F		Inc	DR	W		Totals
2010 Fall	264	24.7%	239	22.3%	172	16.1%	52	4.9%	111	10.4%	5	74	153	14.3%	1,070
2011 Spring	285	22.7%	299	23.8%	213	17.0%	66	5.3%	102	8.1%	11	65	213	17.0%	1,254
2011 Fall	237	20.3%	286	24.5%	218	18.7%	73	6.3%	118	10.1%	8	61	164	14.1%	1,165
2012 Spring	264	23.2%	283	24.8%	195	17.1%	58	5.1%	82	7.2%	10	67	181	15.9%	1,140
2012 Fall	259	24.3%	300	28.1%	194	18.2%	64	6.0%	63	5.9%	10	-	178	16.7%	1,068
2013 Spring	265	24.0%	308	27.9%	199	18.0%	45	4.1%	76	6.9%	1	-	209	18.9%	1,103
2013 Fall	248	23.5%	280	26.5%	170	16.1%	50	4.7%	107	10.1%	2	1	199	18.8%	1,057
2014 Spring	211	23.0%	238	25.9%	175	19.1%	43	4.7%	71	7.7%	4	-	176	19.2%	918
Totals	2,033	29.1%	2,233	32.0%	1,536	22.0%	451	6.5%	730	10.5%					6,983

Source: IR data set

Of the total number of our students who finished a course and received a grade, 29.1% (2,033/6,983) received A's, 61.1% (4,266/6,983) received either an A or a B, and 83.1% (5,802/6,983) received an A, B or C.

2c) Success rates

	Success
2010 Fall	63.2%
2011 Spring	63.7%
2011 Fall	63.8%
2012 Spring	65.4%
2012 Fall	70.7%
2013 Spring	70.0%
2013 Fall	66.1%
2014 Spring	68.0%

NOTE(s):

The "success rate" is the percentage of students who receive a C/CR or better as a final course grade.

There are two different success rates used at El Camino College, each with a different denominator:

a) The success of "Only Completers" excludes students from the formula who withdrew/received a W.

b) The success rate of "All Students" includes all students who were enrolled at census date. This is the rate that the CIS department used in their calculations.

c) The California Community College Chancellor's Office uses only the second (b) rate, so comparisons with other colleges or with statewide averages should use this rate.

On a positive note, our success rates have increased each semester over the eight semester target period. The rates remained somewhat consistent during the target period with a variance from the highest to the lowest of 7.5% for all eight semesters. For the

same time period the CIS department's average success rate was 66.25%. Of note is the fact that 16.78% (1,473) of our students withdrew from class during the time frame and are a large part of what enter into the calculation of "unsuccessful" students.

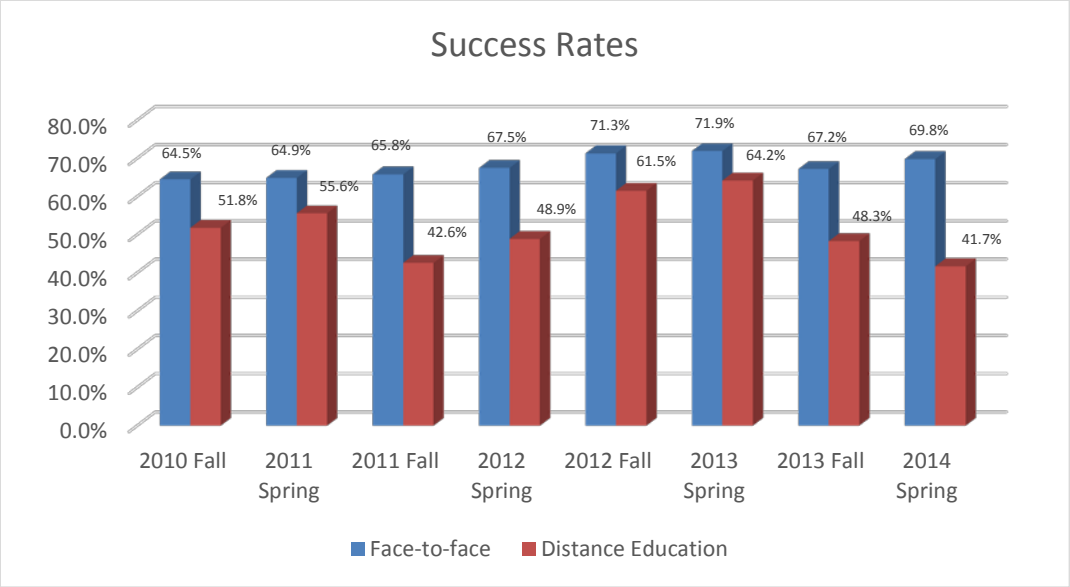
2d) Retention rates

	Retention
2010 Fall	78.8%
2011 Spring	77.8%
2011 Fall	80.7%
2012 Spring	78.2%
2012 Fall	83.3%
2013 Spring	81.1%
2013 Fall	81.1%
2014 Spring	80.8%

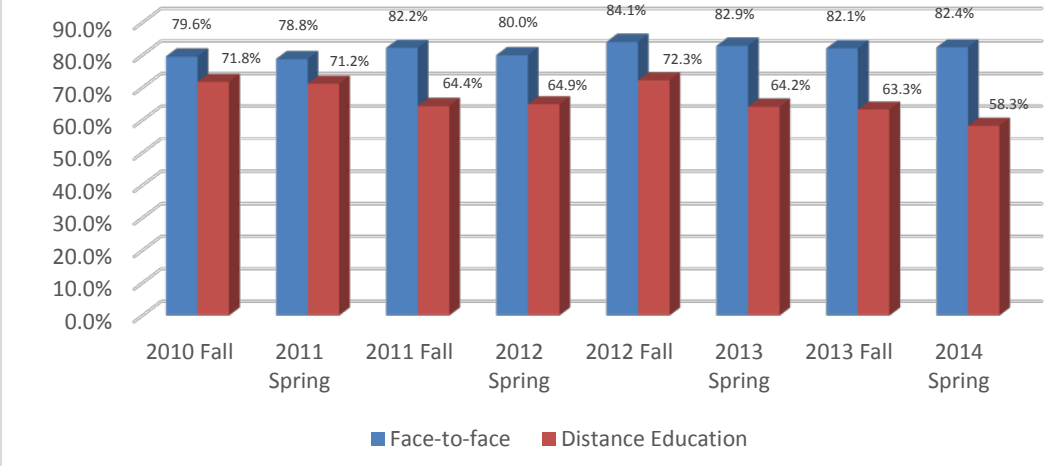
Our retention rates have remained fairly stable over the last four years, and did not differ much from what was reported in the department's 2011 Program Review. There is only a 3% variance between our highest (80.8%) and lowest (77.8%) rates during the last eight semesters.

2e) Comparison of success and retention rates; face-to-face vs. distance education classes

Success Rates		
	Face-to-face	Distance Education
2010 Fall	64.5%	51.8%
2011 Spring	64.9%	55.6%
2011 Fall	65.8%	42.6%
2012 Spring	67.5%	48.9%
2012 Fall	71.3%	61.5%
2013 Spring	71.9%	64.2%
2013 Fall	67.2%	48.3%
2014 Spring	69.8%	41.7%



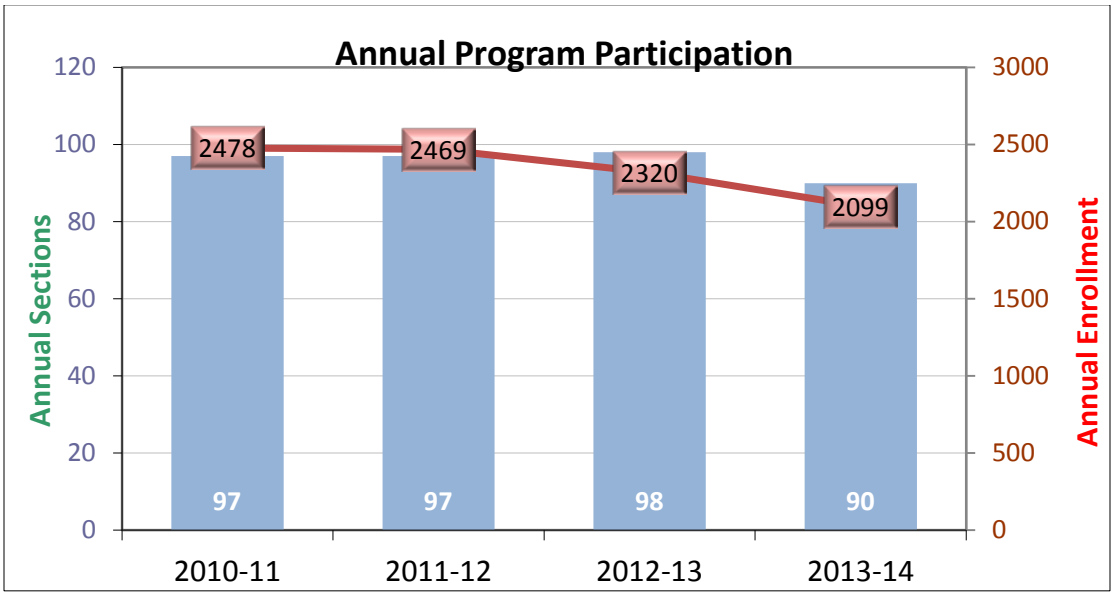
Retention Rates		
	Face-to-face	**Distance Education**
2010 Fall	79.6%	71.8%
2011 Spring	78.8%	71.2%
2011 Fall	82.2%	64.4%
2012 Spring	80.0%	64.9%
2012 Fall	84.1%	72.3%
2013 Spring	82.9%	64.2%
2013 Fall	82.1%	63.3%
2014 Spring	82.4%	58.3%



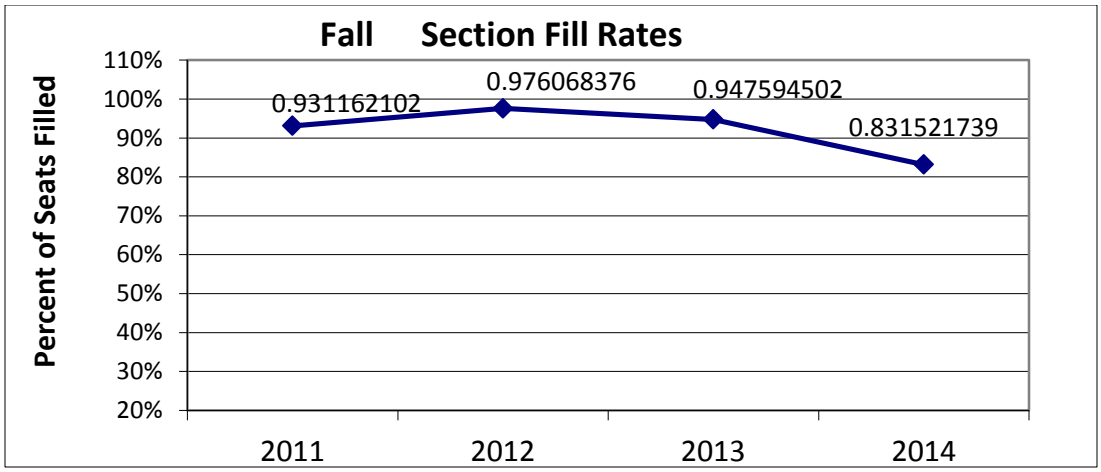
There is a noticeable and consistent drop in each and every semester for both success and retention rates when comparing the "face-to-face" and "distance education" numbers shown above in section 2e. When reviewing the IR data set across other departments on campus a similar trend can be observed. It is felt by some that a number of students who enroll in online classes do so thinking that the class will be easier only to find out it is much harder for those who do not practice time management and/or are not self-motivated. Although there are no available statistics to back this up, it is one possible explanation for the disparity in rates.

2f) Enrollment statistics with section and seat counts and fill rates

	2010-11	2011-12	2012-13	2013-14	4 Year Average
Annual Enrollment	2,478	2,469	2,320	2,099	2,342



	2010-11	2011-12	2012-13	2013-14
Students	2,124	2,121	1,980	1,795
Enrollments/Student	1.17	1.16	1.17	1.17



The data in this section are expressed as annual numbers except for the section fill rates. The section fill rates are for just the fall semesters as this was the only data that was provided by IR.

The section fill rates for the CIS department have usually been in the mid to upper ninetieth % range as illustrated in the chart above. Before the fall semester of 2014 the CIS department added a stricter math and English pre-requisite to our most heavily enrolled class (CIS 13) as we felt that this preparation would enhance a student's chance of success. This unfortunately precluded any student who had not taken the math and English placement tests from enrolling, and our headcount suffered accordingly.

2g) Scheduling of courses (day vs. night, days offered, and sequence

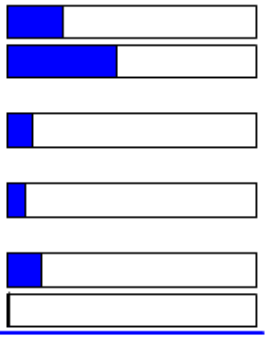
Our scheduling decisions have been determined by what our students indicate they want through their responses on surveys administered from 2006 through 2015, and the department will continue to adjust its future course offerings taking our student's preferences into consideration.

The next two sections (Offerings by Time of Day and Offerings by Day of Week) both contain two graphics. The first one illustrates our student's responses from the 2015 questionnaire, and the second shows how our course offerings have filled their needs.

Time of Day:

Your preferred time for starting a class is:

Response	Frequency	Percent
7am – 9 am	88	22.80
10am – 12 pm	171	44.30
1pm – 3 pm	39	10.10
3pm – 5pm	30	7.77
6pm – 7 pm	53	13.73
Missing	5	1.30



Source: 2015 Spring CIS Program Review Student Survey (question #24)

CIS 13; SECTION OFFERINGS BY TIME OF DAY

Starting Time	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring	Totals	%
From 7:00 am to 9 am	9	10	8	11	11	10	13	11	83	32.4%
From 10:00 am to 12:00 pm	15	13	15	13	12	13	14	8	103	40.2%
From 1:00 pm to 3:00 pm	2	3	3	4	3	4	3	4	26	10.2%
From 3:00 pm to 5:00 pm	1	4	2	1	1	1	0	0	10	3.9%
From 6:00 pm to 7:00 pm	3	3	3	2	3	2	2	2	20	7.8%
Totals	32	34	33	33	32	32	34	26	256	100.0%

Source: El Camino College schedules 2010 fall through 2014 spring

The vast majority of our student population indicated that they preferred to enroll in classes that started before 12 noon, with the most desired time slot being between 10 a.m. and 12:00 p.m.

The 6:00 p.m. and 7:00 p.m. time slot represents mostly our working adult students who could not attend classes during the day due to work commitments.

As a result of these student surveys the CIS department scheduled over 32% of its CIS 13 classes to start before 9:00 a.m., and 72.6% of its CIS 13 classes to start by 12:00 p.m.

Day of Week:

If you were to take another CIS course, you would want it scheduled on:

Response	Frequency	Percent
Once a week	64	16.58
Monday/Wednesday	154	39.90
Tuesday/Thursday	138	35.75
Monday/Wednesday/Friday	11	2.85
Weekend	17	4.40
Missing	2	0.52

Source: 2015 Spring CIS Program Review Student Survey (question #23)

CIS 13; SECTION OFFERINGS BY DAY										
Day	**2010 Fall**	**2011 Spring**	**2011 Fall**	**2012 Spring**	**2012 Fall**	**2013 Spring**	**2013 Fall**	**2014 Spring**	**Totals**	**%**
Monday										
Tuesday										
Wednesday										
Thursday										
Friday	2	2	2	1	1		1		9	3.52%
Saturday	1	1	1						3	1.17%
Monday/Wednesday	15	16	15	15	16	15	16	13	121	**47.27%**
Tuesday/Thursday	12	14	13	15	13	15	15	12	109	**42.58%**
Wednesday/Friday										
Mon/Tues/Wed/Thurs										
Online	2	1	2	2	2	2	2	1	14	5.47%
Totals	32	34	33	33	32	32	34	26	256	100.0%

Source: El Camino College schedules Fall 2010 through 2014 Spring

If given a choice, our students showed a marked preference to attend class twice a week (75.65%) over once a week (16.58%), and definitely not three times a week (2.85%), or weekends (4.40%).

In response to our student's preferences the CIS department offered 89.85% of its CIS 13 classes as a Monday/Wednesday, Tuesday/Thursday or Wednesday/Friday pairing.

NUMBER OF SECTIONS OFFERED										
Course	**2010 Fall**	**2011 Spring**	**2011 Fall**	**2012 Spring**	**2012 Fall**	**2013 Spring**	**2013 Fall**	**2014 Spring**	**Totals**	**%**
CIS 3	2	3	3	2	3	3	3	3	22	6.18%
CIS 11			Cancel		1	Cancel		1	2	0.56%
CIS 13	32	34	33	33	32	32	34	26	256	**71.91%**
CIS 16		1		1		1		1	4	1.12%
CIS 18	1	1		1		1	1	1	6	1.69%
CIS 19		1	1	1	1	1	1	1	7	1.97%
CIS 20	1	1					Cancel		2	0.56%
CIS 26	1	1	1	1	1	1	1	1	8	2.25%
CIS 27									0	0.00%
CIS 28	1	1	1	1	1	1	1	1	8	2.25%
CIS 29		Cancel							0	0.00%
CIS 30	Cancel	1	1	1	1	1		1	6	1.69%
CIS 40	Cancel		1		1	1			3	0.84%
CIS 80							Cancel		0	0.00%
CIS 133		1		1		1		1	4	1.12%
CIS 134	1		1		1		1		4	1.12%
CIS 140	1	1	1	1	1	1	1	1	8	2.25%
CIS 141	1	1	1	1	1	1	1	1	8	2.25%
CIS 142		1		1		1		1	4	1.12%
CIS 143	1		1		1		1		4	1.12%
Totals	42	48	45	45	45	46	45	40	356	100.00%

Source: El Camino College schedules Fall 2010 through 2014 Spring

CIS 13 is our most heavily enrolled class (71.91% of our total enrollment) as it is a requirement for computer literacy, and is fully articulated with all of the University of California, California State, and private local colleges and universities. With this in mind we have offered over thirty sections of CIS 13 every spring and fall semester, and a reduced number of sections during summer.

Our advanced courses (ones that have CIS 13 or other CIS courses as a prerequisite or recommended prerequisite) account for a much smaller percentage of our enrollment because it requires students who have already passed CIS 13 with a minimum grade of C, and a desire to take additional CIS courses. Because the available pool of students is much smaller than that of CIS 13, we are unable to offer anywhere near as many sections. To accommodate as many of our advanced students as possible we rotate our advanced courses so that they are offered at night one semester, and during the day the next time it is offered. Many of our sequenced advanced classes require two to three semesters of the intermediate class in order to have enough demand to fill the advanced class.

2h) Improvement rates

	Fall 2006	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Success Rates	**60.9%**	**65.8%**	**63.2%**	**63.8%**	**70.7%**	**66.1%**
Retention Rates	**78.1%**	**80.4%**	**78.8%**	**80.7%**	**83.3%**	**81.1%**

Our success and retention rates for the last four fall semesters have remained fairly consistent, and are roughly the same as the last two fall semesters that were reported on our 2011 Program Review.

The titles and data shown above were supplied by Institutional Research. It was suggested during the 2011 Program Review that "improvement rates" should measure only the success rates of students in a higher level class after first passing a lower level pre-requisite class.

Gathering data to measure this would be an extremely time consuming process because in order to be accurate and have any meaning the calculations would have to compare the grades on an individual student basis instead of by totals. Even then, listed below are some of the factors that make this definition of improvement rates difficult to assess on an individual student basis.

a) A number of students do not take classes that serve as pre-requisites (like CIS 13) at the El Camino campus. It is impossible to tell how well they were actually prepared for success in future classes to be taken at El Camino.
b) Some students submit, and are granted a waiver from a pre-requisite class due to experience. In this case there would be no grade for the earlier class.
c) Not all teachers are equal in many respects. In one such area, a student may have had a teacher in the pre-requisite class who was a more lenient grader then the teacher in the later class, or vice versa.
d) The very nature of an advanced class indicates that the material covered is more difficult than that covered in the pre-requisite class. If a student earns an 85% in CIS 13, but drops to an 84% in a more advanced class the drop of 1% with more difficult material might be seen in a negative light to those who only go by the numbers.

2i) Additional data

Additional demographic headcount data is presented below with significant numbers in "green" (black and white in non-digital copy) in order to help better understand our student population.

Ethnicity

	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring
African-American	**20.3%**	**19.6%**	**22.4%**	**18.6%**	**19.1%**	**19.9%**	**21.6%**	**16.3%**
American Indian or Alaskan. Native	0.2%	0.3%	0.0%	0.5%	0.2%	0.1%	0.4%	0.0%
Asian	**18.1%**	**21.1%**	**19.3%**	**19.0%**	**18.7%**	**19.7%**	**18.9%**	**19.1%**
Latino	**35.5%**	**36.4%**	**38.3%**	**38.3%**	**40.8%**	**40.6%**	**39.2%**	**46.8%**
Pacific Islander	1.2%	0.4%	0.5%	0.7%	0.8%	0.3%	1.0%	0.6%
White	16.4%	14.6%	12.9%	17.0%	13.6%	13.9%	13.8%	12.6%
Two or More	2.5%	2.6%	3.1%	2.7%	4.9%	4.2%	3.7%	3.6%
Unknown or Decline	5.8%	5.1%	3.5%	3.4%	1.8%	1.2%	1.4%	1.0%

Age/Age Group

	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring
<17	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
17	1.5%	0.3%	1.5%	0.4%	2.0%	0.4%	1.7%	0.6%
18	9.6%	6.5%	9.6%	7.9%	8.9%	7.7%	10.7%	6.5%
19	**13.0%**	**10.5%**	**11.1%**	**10.4%**	**12.9%**	**11.5%**	**12.2%**	**11.9%**
20	**12.2%**	**12.3%**	**11.1%**	**12.8%**	**11.6%**	**10.3%**	**12.4%**	**12.3%**
21	**7.9%**	**10.2%**	**9.5%**	**9.3%**	**9.0%**	**10.2%**	**9.5%**	**8.2%**
22	**6.1%**	**8.6%**	**9.2%**	**7.2%**	**7.2%**	**6.9%**	**7.1%**	**8.1%**
23	**5.4%**	**4.6%**	**4.9%**	**7.1%**	**6.9%**	**6.7%**	**5.4%**	**7.5%**
24	4.9%	4.9%	4.5%	5.3%	4.7%	5.3%	4.7%	5.7%
25-29	15.3%	14.6%	14.1%	14.5%	14.1%	15.2%	14.4%	16.4%
30-39	11.6%	13.4%	12.2%	11.8%	10.3%	12.0%	10.8%	12.5%
40-49	8.3%	8.1%	6.6%	7.6%	6.5%	7.6%	6.7%	6.0%
50-64	3.7%	5.2%	5.4%	5.6%	5.7%	5.1%	3.7%	3.9%
65+	0.3%	0.8%	0.3%	0.2%	0.2%	1.0%	0.6%	0.4%

Class Load

	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring
Full-time	37.2%	36.0%	37.3%	34.6%	34.7%	32.2%	39.4%	38.7%
Part-time	**61.3%**	**63.3%**	**61.4%**	**64.8%**	**64.0%**	**64.0%**	**59.0%**	**59.9%**

Academic Level

	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring
College degree	11.3%	11.4%	10.3%	11.0%	10.9%	11.2%	10.4%	11.7%
HS Grad	**84.8%**	**84.8%**	**86.8%**	**85.3%**	**84.8%**	**85.6%**	**85.9%**	**85.1%**
Not a HS Grad	1.8%	2.4%	1.6%	1.8%	1.8%	0.4%	0.1%	0.2%
K-12 Special Admit	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.0%	0.2%
Unknown	1.8%	1.1%	1.1%	1.7%	2.2%	2.8%	3.6%	2.7%

Educational Goal

	2010 Fall	2011 Spring	2011 Fall	2012 Spring	2012 Fall	2013 Spring	2013 Fall	2014 Spring
Intend to Transfer	**31.7%**	**32.1%**	**31.3%**	**29.4%**	**31.4%**	**30.9%**	**32.7%**	**30.8%**
Degree/Certificate Only	5.0%	5.0%	5.4%	4.5%	5.6%	4.9%	4.4%	4.4%
Retrain/recertif.	5.2%	5.5%	4.2%	4.8%	4.3%	5.0%	4.1%	4.4%
Basic Skills/GED	3.8%	4.2%	4.6%	6.1%	4.8%	5.9%	6.0%	6.3%
Enrichment	4.6%	4.4%	4.5%	3.2%	3.2%	4.3%	2.7%	3.4%
Undecided	**16.9%**	**15.7%**	**17.2%**	**18.1%**	**14.9%**	**14.3%**	**13.6%**	**13.9%**
Unstated	**32.7%**	**33.1%**	**32.8%**	**33.8%**	**35.7%**	**34.6%**	**36.6%**	**36.9%**

The following observations can be made regarding our student population.

- **Age:** 48% are between the ages of 19 and 23 inclusive, with 24.2% of the total population being either 19 or 20 years old.
- **Class Load:** 59.9 % are part-time students
- **Academic Level:** The highest level for 85.1 % of them is a high school degree
- **Ethnicity:** Almost half (46.8%) are Latino, with another combined third being either Asian (19.1%) or African American (16.3%).
- **Educational Goal:** Although close to one-third (30.8%) intend to transfer, but an even higher number (50.8%) are undecided or did not state their educational goal.

2j) Related recommendations

1. Professional lab aides should be available in both open labs and class labs to tutor and provide aid to students with their work. Department faculty need lab aides in their lab to get all lab related questions answered in a timely manner. Students in lab, unlike any other classroom setting, need one on one help in a timely manner to complete the required assignments. Funding for lab aides will directly benefit students and increase both retention and success.

2. Personnel should be hired to publicize all of our CIS programs to local industry and high schools. Marketing has not been done, and many students find us only by searching on their own. El Camino resides in a heavy tech area with companies like Google preparing to move into Playa Vista. As such we feel that the college should work harder to accommodate local industries. It is not enough to just publicize the college as all too often the community does not realize the breadth and depth of the CIS programs offered.

3. Re-institute a winter session. In this way students can concentrate on only one class at a time instead of many and increase their chances of success.

3. Curriculum

a) Curriculum course review timeline
b) Explanation of course additions to current course offerings
c) Explanation of course deletions and inactivation's from current course offerings
d) Distance education; course descriptions and number of sections offered
e) Courses, degrees and certificates
   1. Listing of all courses that are required for our program's degrees and certificates that have been offered during the last two years, and a course offering cycle
   2. Concerns regarding department/program's courses and their articulation
   3. Degrees, certificates, and licensure exams (when applicable)
f) Related recommendations

3a) Curriculum; Six-year course review timeline

"*Past*" timeline that corresponds to the current Program Review timeframe

Division: Business		Department: Computer Information Systems				Faculty:				Date: 11/24/2009				Semester/year of next Program Review:		
Total # of Courses:	23	Courses Requiring CCC Blanket Approval: (Special Topics, CWEE, and Independent Study courses)								2						
		YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6				
Course	Last Course Review	FA 10	SP 11	FA 11	SP 12	FA 12	SP 13	FA 13	SP 14	FA 14	SP 15	FA 15	FA 15	SP 16		
CIS-11	2007-2008							X								
CIS-13	2005-2006	*		X												
CIS-133	2007-2008					X										
CIS-134	2006-2007					X										
CIS-140	2009-2010													X		
CIS-141	2009-2010													X		
CIS-142	2006-2007					X										
CIS-143	2006-2007					X										
CIS-16	2007-2008							X								
CIS-18	2009-2010												X			
CIS-19	2009-2010												X			
CIS-20	2006-2007					X										
CIS-26	2008-2009									X						
CIS-27	2008-2009									X						
CIS-28	2008-2009									X						
CIS-29	2008-2009									X						
CIS-3	2004-2005	X														
CIS-30	2006-2007					X										
CIS-40	2005-2006			X												
CIS-50	2008-2009									X						
		YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		YEAR 6				
Course	Last Course Review	FA 10	SP 11	FA 11	SP 12	FA 12	SP 13	FA 13	SP 14	FA 14	SP 15	FA 15	FA 15	SP 16		

CIS-80	2008-2009					X		
CIS-95/96abcd	2008-2009					X		
CIS-99abc	2009-2010							X

"*Future*" timeline that extends past the current Program Review timeframe

Division: Business		**Department: Computer Information Systems**		**Faculty:**		**Date: 5/3/2015**		**Semester/year of next Program Review:**			
Total # of Courses:	**22**	**Courses Requiring CCC Blanket Approval: (Special Topics, CWEE, and Independent Study courses)**					**2**				
	Last	**YEAR 1**		**YEAR 2**		**YEAR 3**		**YEAR 4**		**YEAR 5**		**YEAR 6**	
Course	**Course Review**	**FA 15**	**SP 16**	**FA 16**	**SP 17**	**FA 17**	**SP 18**	**FA 18**	**SP 19**	**FA 19**	**SP 20**	**FA 20**	**SP 21**
CIS-11	2013-2014									X			
CIS-13	2012-2013							X					
CIS-133	2012-2013							X					
CIS-134	2012-2013							X					
CIS-136	2014-2015												X
CIS-140	2009-2010		X										
CIS-141	2009-2010		X										
CIS-142	2012-2013							X					
CIS-143	2012-2013							X					
CIS-16	2013-2014									X			
CIS-18	2014-2015											X	
CIS-19	2014-2015											X	
CIS-26	2014-2015											X	
CIS-28	2014-2015											X	
CIS-29	2014-2015											X	
CIS-2	*												X
CIS-3	2010-2011			X									
CIS-30	2012-2013							X					
CIS-40	2011-2012					X							
CIS-80	2014-2015											X	
CIS-95/96abcd	2008-2009	X											

* This course was approved in spring 2015

3b) Explanation of course additions to current course offerings

Since the prior program review in 2011, the CIS department has added the following courses to the curriculum:

1) CIS 136 (Building Mobile Apps)
2) CIS 2 (Office Application Software)

CIS 136 was added to the curriculum in order to keep abreast of technology. The course focuses on developing hybrid Mobile Apps. It teaches a development

approach that the industry is embracing as a quick and easy way to create a mobile presence. The course was developed due to high demand in the IT workforce for mobile application designers and developers, and received the approval of our advisory committee.

CIS 2 was developed as an outcome of revising CIS 13. CIS 13 was revised to meet the C-ID requirement (C-ID designation IT IS 120/BUS 140) for Transfer Model Curriculum. This conversion eliminated several key topics, while expanding on others. CIS 2 was designed to adopt those "eliminated" topics and expand upon them. This fulfilled the need for students needing to develop basic background skills using common office technologies. Topics include Microsoft Word, PowerPoint, and Outlook, as well as an understanding of an operating system and the Internet.

3c) Explanation of course deletions from current course offerings

The following courses will no longer be offered, and are in queue for course inactivation. This is due to changes in the direction of the department, and/or changes in the direction of technology:

1. CIS 20 (Microsoft Windows)
2. CIS 27 (Using Spreadsheet Macros)

CIS 20 (Microsoft Windows). This one unit course focused on the use and maintenance of a Windows based computer system and prepared students to set up and protect their home or office computer. The course was designed to cover the newest windows operating system, so demand normally peaked when Microsoft released a new version of Windows. Due to the changes mentioned earlier in the CIS13 (Computer Information Systems), as well as changes in CIS40 (Personal Computer Operations), and CIS 19 (Internet, Security, and the Web), this material is now properly covered in these other courses, and there is no longer a need to offer a separate course.

CIS 27 (Using Spreadsheet Macros). As mentioned earlier, the CIS13 (Computer Information Systems) course, was significantly modified to conform to the C-ID requirement (C-ID designation IT IS 120/BUS 140) for Transfer Model Curriculum. This greatly modified the course, encompassing most of the concepts covered in CIS 27. As a result of adopting the C-ID designation, there was no longer a need to offer a separate course.

3d) Distance education (included hybrid); course descriptions and number of sections offered

The following courses have been offered in online or hybrid formats during the eight semester time frame of this program review.

CIS 13 – Computer Information Systems: This course introduces students to the concepts and technologies used in processing information in an organization.

Topics include information systems, database management systems, networking, e-commerce, ethics and security, computer systems hardware, and applications. Students will apply these concepts and methods through hands-on projects developing computer-based solutions using application software.

This is our basic introductory course and it has been offered fourteen times (either one or two sections per semester).

CIS 30 – Introduction to eCommerce: This introductory course will acquaint the student with fundamentals of eCommerce. The primary focus will be the study of current eCommerce practices, business models, techniques and opportunities for conducting business via the Internet. This course will help to prepare students for employment as Web masters, website designers, and eCommerce business managers.

This course was only offered once in a online/hybrid format.

CIS 142 – Local Area Network (LAN) Switching and Wireless CISCO (CISCO 3): This course provides an understanding of how switches are interconnected and configured to provide network access to Local Area Network users. It also provides instruction on how to integrate wireless devices into Local Area Networks. This course is technically oriented and will prepare students for industry certification.

This is the third of four courses that can lead to CISCO certification, and is one of the harder classes to find instructors for, due to the CISCO certification requirement. It has been offered four times in an online format due to teacher availability.

CIS 143 – Access the WAN (CISCO 4): This course provides a fundamental understanding of WAN (Wide Area Network) networking concepts and a wide range of network technologies. Instruction is given on several WAN technologies, including PPP (Point to Point), frame relay, and related topics, such as access control list, network address translation, and virtual P\ private networks.

This is the fourth of four courses that can lead to CISCO certification, and is one of the harder classes to find instructors for, due to the CISCO certification requirement. It has been offered four times in an online format due to teacher availability.

3e) Courses, degrees and certificates

3e1) Listing of all courses that are required for our program's degrees and certificates that have been offered during the last two years, and a course offering cycle

Below is a list of all of the courses offered over the last six semesters, as well as the number of sections of each course that were offered. The majority of these courses are required for the CIS degree and/or certificates.

	Number of Sections Offered							
Course	**2010 Fall**	**2011 Spring**	**2011 Fall**	**2012 Spring**	**2012 Fall**	**2013 Spring**	**2013 Fall**	**2014 Spring**
CIS 3	2	3	3	2	3	3	3	3
CIS 11		1 CAN			1	1 CAN		1
CIS 13	32 2 CAN	35	33	33	32 1 CAN	32 1 CAN*	34 1 CAN	26
CIS 16		1		1		1		1
CIS 18	1	1		1		1	1	1
CIS 19		1	1	1	1	1	1	1
CIS 20	1	1					1 CAN	
CIS 26	1	1	1	1	1	1	1	1
CIS 27								
CIS 28	1	1	1	1	1	1	1	1
CIS 29								
CIS 30	1 CAN	1	1	1	1	1		1
CIS 40	1 CAN		1		1	1		
CIS 80							1 CAN	
CIS 133		1		1		1		1
CIS 134	1		1		1		1	
CIS 136							1 CAN*	
CIS 140	1	1	1	1	1	1	1	1
CIS 141	1	1	1	1	1	1	1	1
CIS 142		1		1		1		1
CIS 143	1		1		1		1	1
Totals	42	49	45	45	45	46	45	40

* Course was not originally printed in the Spring 2013 class schedule; it was added, and then subsequently cancelled.

Course Cancellations: As shown in the chart above, CIS 20, CIS 11, CIS 40, and CIS 80 were offered but cancelled due to low enrollment. In these cases, the courses have not been offered for several semesters. In two cases, CIS 13

and CIS 136, the course was not printed in the course catalog, and therefore students did not know of the course offerings. Enrollment was low, and these courses were also canceled.

Courses not offered: The advanced Excel and Access courses, CIS 27 and CIS 29 respectively, have not been offered for several semesters. The reason is due to a change in the direction of technology, coupled with a modification to the CIS 13 course, to conform to the C-ID for Transfer Model Curriculum. Material originally covered in CIS 26 and CIS 29 was moved into the revised CIS 13. Material from CIS 27 was moved into CIS 26. On the recommendation of the CIS Advisory board, the additional material covered in the CIS 29 and CIS 80 classes is being consolidated to become a more advanced database course. CIS 27 will eventually become inactivated, and CIS 80 will be modified to eliminate the focus on Oracle and become, with CIS 29 the more advanced database course.

3e2 Concerns regarding department/program's courses and their articulation

Several of the CIS course articulate to the CSU/UC systems. The CIS Department has no current concerns regarding articulation.

3e3 Degrees, certificates, and licensure exams (when applicable)

El Camino College offers an Associate of Science degree in Computer Information Systems (CIS), and the CIS department currently offers two certificates. The CIS department faculty reviews the courses needed to obtain each certificate to ensure that they meet the requirements expected of today's employers. The past three meetings with the CIS advisory board have focused on directions in technology and industry needs. As a result, CIS curriculum is in the process of being modified to develop the following courses/certificates (these are explained in more depth in section 3f):

- Business Programming Certificate
- Computer User Support Specialist Certificate
- Business Information Worker Certificate
- Database Management Certificate
- Small Business Technical Support Certificate
- CISCO Networking Certificate
- Database Management course
- Networking Fundamentals course

The table below details the number of students who have earned CIS degrees or certificates over the period fall 2010 through spring 2014:

	2010-2011	2011-2012	2012-2013	2013-2014
A.S Degree	13	12	13	14
Certificates	2			2

The number of students seeking CIS degrees has stayed constant and in line with expectations, while the number of certificates has decreased. This has been discussed with the CIS advisory board. The board recommended modernization and expansion of the certificates to meet the specific industry needs. The recommendations are further described in section 3f.

3f) Related recommendations

1. It would be beneficial to our students to provide a counseling session which would apprise them of the career choices and the educational requirements within the CIS area. All too often students, who may be more interested in the CIS area, choose Computer Science (CS) because of a lack of understanding of the field and the employment needs as it relates to CIS.

2. Current Curriculum Plans

At the recommendation of the CIS Advisory board, coupled with significant industry research, the CIS department is in the process of developing the following certificates:

a) Business Programming Certificate
The Business Programming Certificate of Achievement is designed for students who wish to learn the essential skills to become business programmers in the field of information technology. The certificate focuses on developing well designed business software for a variety of platforms, including the desktop, the web, and the mobile environments. Upon completion of all required courses, students will have the basic skills to compete for entry level positions as business programmers, and will be able to analyze business situations and devise appropriate computer software solutions to solve a variety of business problems.

b) Computer User Support Specialist Certificate
This certificate program is designed to prepare students to provide technical assistance to computer users in the role of Computer User Support Specialist. Students will be able to answer questions and resolve a variety of computer problems experienced by clients. The student will learn to provide assistance concerning the use of computer hardware and software, including printing and component installation, word processing, electronic mail, spreadsheets, and operating systems.

c) Business Information Worker Certificate
This is a chancellors' level certificate and it has been determined that the CIS department meets the criteria to offer it. It is a modernization of a current certificate, Computer System Applications, which will be retired[1]. This certificate will prepare students with the broad range of skills needed for entry-level office positions.

d) Database Management Certificate
This certificate program will prepare students for careers in database design, development, and the usage and management of data.

e) Small Business Technical Support Certificate
The Small Business Technical Support Certificate of Achievement is designed for students who wish to learn the essential skills to entry level jobs, or start their own business, repairing computers, setting up networks, assigning user accounts/access, or managing a help desk.

f) CISCO Networking Certificate
The CISCO certificate will provide students with the skills and tools needed to install, configure and maintain the current state of the art Internet based networking technologies according to the guidelines set forth by CISCO systems and CISCO Networking Academy

g) Database Management course
This course educates the student on how data is used and managed by a company. Topics such as data warehousing, data analytics, data mining, data modeling, data backups, and data reporting, especially with a popular tool such as Crystal Reports, are covered.

h) Networking Fundamentals course
The Network Fundamentals course will be a modernization of an existing course CIS 40, Personal Computer Operations. There will be a stronger focus on today's technology needs which include topics such as general PC maintenance, setting up small networks (LAN's), data backups, security, and telecommunications.

CIS faculty have examined all of the courses to ensure that offering them online is appropriate. Not every course should be offered online as the online version would be nowhere near as effective in providing the students with the skill competencies they would be capable of developing in the classroom experience. As a result of this examination, CIS 18, CIS 19, and CIS 30 have been identified as courses that should not be offered online, and are in the curriculum queue, to remove the distance Ed option.

The following courses have been removed from the current course offerings, and are in queue for course inactivation. This is due to changes in direction, and/or changes in the direction of technology:

3. CIS 20 (Microsoft Windows)
4. CIS 27 (Using Spreadsheet Macros) – content has moved into CIS 13

[1] Note: Of the two certificate programs offered, it was recently discovered that only one certificate, the Computer Systems Applications Certificate of Achievement, was approved by the Chancellor's office. Curriculum changes (above with the development of the Small Business Technical Support Certificate) are addressing this area of concern

3. New Focus Areas

In addition to the above plans that are currently in various stages of development, new areas of demand by employers and of interest to students are being explored by the CIS department with the approval of our CIS Advisory Board. These include:

a) Industry specific education (i.e. Medical Billing Technology, Health Information Specialization, etc.). The department is hopeful to begin a Health Care Technology program within two years. This means that that curriculum would be submitted in 2015. Curriculum will consist of at least one new course and one certificate. Additional certificates will be forthcoming.

b) New Focus Areas: Computer Forensics and CyberSecurity. At least one more course and one certificate will need to be developed in this area.

4. Assessment of Student (SLO) and Program (PLO) Learning Outcomes

a. Course, program and institutional learning outcomes alignment grid
b. Timeline for course and program level SLO assessments
c. Percent of course and program SLO statements that have been assessed
d. Assessment results and recommended/implemented changes resulting from course and program level SLO assessment
e. Program's SLO and assessment improvement methodologies
f. Related recommendations

4a) Course, program and institutional learning outcomes alignment grid

BUSINESS
Institutional (ILO), Program (PLO), and Course (SLO) Alignment

Program: **Computer Information Systems**	**Number of Courses:** 21	**Date Updated:** 09.18.2014	**Submitted by:** Kurt Hull, ext. 3775 Ana Milosevic, ext. 3784

ILOs	**1. Critical Thinking** *Students apply critical, creative and analytical skills to identify and solve problems, analyze information, synthesize and evaluate ideas, and transform existing ideas into new forms.*	**2. Communication** *Students effectively communicate with and respond to varied audiences in written, spoken or signed, and artistic forms.*	**3. Community and Personal Development** *Students are productive and engaged members of society, demonstrating personal responsibility, and community and social awareness through their engagement in campus programs and services.*	**4. Information Literacy** *Students determine an information need and use various media and formats to develop a research strategy and locate, evaluate, document, and use information to accomplish a specific purpose. Students demonstrate an understanding of the legal, social, and ethical aspects related to information use.*

SLO-PLO-ILO ALIGNMENT NOTES:

Mark boxes with an 'X' if: SLO/PLO is a major focus or an important part of the course/program; direct instruction or some direct instruction is provided; students are evaluated multiple times (and possibly in various ways) throughout the course or are evaluated on the concepts once or twice within the course.

DO NOT mark with an 'X' if: SLO/PLO is a minor focus of the course/program and some instruction is given in the area but students are not formally evaluated on the concepts; or if the SLO/PLO is minimally or not at all part of the course/program.

PLOs	**PLO to ILO Alignment** *(Mark with an X)*			
	1	**2**	**3**	**4**
PLO #1 Professional Awareness Students will be able to explain ethical, legal, and societal implications inherent in information technology and understand the professional responsibilities of a computer professional.	X	X		X
PLO #2 Business Communication Upon the completion of a course of study in Computer Information Systems students will be able to demonstrate proficiency in common industry software applications, cyber applications and Network security to effectively analyze business problems and communicate decisions.	X	X		X
PLO #3 Skill Development Upon the completion of a course of study in Computer Information Systems students will be able to demonstrate the ability to use computer information concepts and critical thinking skills to analyze business problems, and design, develop and implement appropriate software solutions, using a variety of software tools and computer languages.	X	X		X

SLOs	SLO to PLO Alignment *(Mark with an X)*			COURSE to ILO Alignment *(Mark with an X)*			
	P1	P2	P3	1	2	3	4
CIS 11 Help Desk Operations: SLO #1 Dealing with Customers Identify the communication strategies to build rapport and trust with customers and the proven techniques to handle irate, difficult and demanding customers.	X	X					
CIS 11 Help Desk Operations: SLO #2 Help Desk Operations Identify the major steps in the incident Management process.			X				
CIS 11 Help Desk Operations: SLO #3 Technical Writing Develop and create examples of end-user support documentation using enhancements including diagrams, images, and screen captures in order to produce user guides and FAQs.		X	X				
CIS 11 Help Desk Operations: SLO #4 Managing Knowledge Resources Demonstrate the use of software tools used to manage knowledge resources relating to end-user technical support.		X	X	X	X		X
CIS 11 Help Desk Operations: SLO #5 Management Understand and evaluate the needs of the users in an organization, the cost and benefit of fulfilling the needs, and the staffing and training of the help desk to properly support the organization.	X						
CIS 11 Help Desk Operations: SLO #6 Professional Protocol Understand the mission of the help desk in an organization, and the professional responsibilities and skills required of a help desk technician.	X						
CIS 13 Computer Information Systems: SLO #1 Applicability Solve common business problems using appropriate information technology applications and systems design and developmental tools.		X	X				
CIS 13 Computer Information Systems: SLO #2 Applicability Demonstrate an understanding of the system development process and use of information systems within an organization.			X				
CIS 13 Computer Information Systems: SLO #3 Communications Identify and analyze existing and emerging technologies and their impact on organizations and society including communication and global relationships.	X		X	X	X		X
CIS 13 Computer Information Systems: SLO #4 Networking Demonstrate knowledge of network configurations, risk management and security protocols.			X				
CIS 133 Mashup JavaScript, jQuery and AJAX: SLO #1 Fundamental Concepts of Client-Side Programming Students will demonstrate their ability to bring excitement to web pages using the fundamental components in the JavaScript programming language, including form data validation techniques, event handling using functions, timers, and control structures, repetitive programming methods, objects and object models, and the jQuery library.			X				
CIS 133 Mashup JavaScript, jQuery and AJAX: SLO #2 Incorporating Data in Client-Side Programs Students will demonstrate their ability to incorporate client side data storage and transmission techniques using cookies, hidden form fields, querystrings, eXtensible Markup language (XML), JavaScript Object Notation (JSON), and Asynchronous JavaScript and XML (AJAX).			X	X	X		X
CIS 133 Mashup JavaScript, jQuery and AJAX: SLO #3 Developing a Software Application for the Web Students will demonstrate the ability to create an e-commerce website that includes a fully functioning shopping cart and checkout/payment process, using a web development approach that incorporates planning, designing, coding, testing, and publishing to a web server.		X	X				
CIS 134 ASP.NET with C# Business Web Programming: SLO #1 Developing an E-Commerce Software Application for the Web The student will demonstrate the ability to create an e-commerce website using ASP.NET and C#. Given detailed specifications and example code, create a functioning e-commerce website that includes: a) a market-competitive user interface, b) a shopping cart, c) product recommendations, d) an order pipeline to follow the order process, e) a database which includes customers, products with product attributes, orders,audit, order, inventory, and product recommendation information, and search capability.		X	X				
CIS 134 ASP.NET with C# Business Web Programming: SLO #2 SQL, C# and ASP.NET Demonstrate knowledge of e-commerce development programming language usage.			X	X	X		X
CIS 134 ASP.NET with C# Business Web Programming: SLO #3 Website Planning Demonstrate project design and management of a complete e-commerce website including the use of requirements document, database and class diagrams, use case definitions, flowcharts, cross-functional flowcharts, site maps, user controls, classes and timelines.		X	X				
CIS 136 Building Mobile Apps: SLO #1 Understanding Mobile Frameworks Students will be understand the different types of application frameworks used to develop mobile applications..			X				
CIS 136 Building Mobile Apps: SLO #2 Designing Mobile User Interfaces Students will be able to design and create effective mobile application user interfaces.		X	X	X	X		X
CIS 136 Building Mobile Apps: SLO #3 Developing Mobile Applications Students will be able to architect, develop, test, and debug mobile applications that display various types of digital media, manage data, and use the native features of a mobile device.			X				
CIS 136 Building Mobile Apps: SLO #4 Marketing Mobile Applications Students will understand how to deploy a mobile app to the app marketplace.			X				

SLOs	SLO to PLO Alignment *(Mark with an X)*			COURSE to ILO Alignment *(Mark with an X)*			
	P1	P2	P3	1	2	3	4
CIS 140 Data Communications CISCO 1: SLO #1 Data Communication Terms Describe and explain data communication terms such as broadband and baseband communications.		X					
CIS 140 Data Communications CISCO 1: SLO #2 Modulation Techniques Describe and use different modulation techniques such as time-division and frequency division.		X					
CIS 140 Data Communications CISCO 1: SLO #3 Network Systems Analyze and design network systems using differing transmission methods such as copper wire, fiber optics, microwave and satellite.		X	X				
CIS 140 Data Communications CISCO 1: SLO #4 Communications with the Internet Use microcomputer hardware and software to facilitate communications with the Internet. Describe how microcomputer hardware relates to data communications. Analyze security issues such as protections, detection and correction.	X			X	X		X
CIS 140 Data Communications CISCO 1: SLO #5 Local and Wide Area Networks Describe and define the similarities and differences between local area and wide area networks.		X					
CIS 140 Data Communications CISCO 1: SLO #6 Ethical Considerations Identify ethical considerations such as privacy, hacking, and piracy.	X						
CIS 141 Networking Microcomputers CISCO 2: SLO #1 Connection and Connection-less Oriented Networks Describe connection-oriented network services and connectionless- oriented network services and identify their key differences.		X					
CIS 141 Networking Microcomputers CISCO 2: SLO #2 Basic Methods Define flow control and describe the three basic methods used in connection oriented networking.		X		X	X		X
CIS 141 Networking Microcomputers CISCO 2: SLO #3 Functions of the TCP/IP Identify the functions of the TCP/IP transport-layer protocols.		X					
CIS 141 Networking Microcomputers CISCO 2: SLO #4 Comparing Protocols Compare TCP/IP protocols to the ISO reference model layer four.		X	X				
CIS 141 Networking Microcomputers CISCO 2: SLO #5 ICMP Functions Identify the functions performed by ICMP.		X					
CIS 141 Networking Microcomputers CISCO 2: SLO #6 Routing Type Problems List problems that each routing type encounters when dealing with topology changes, and describe techniques used to reduce the number of these problems.		X	X				
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #1 Router Components Identify router components such as Ethernet and Serial Interfaces, Console and Auxiliary ports, RAM, NVRAM, and ROM memory.		X					
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #2 Router Hardware Configuration Create valid router hardware configurations using proper router protocols, IP addressing, interface addressing, and network address identification.		X	X				
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #3 Router Design of LANs and WANs Install and configure routers for design of LANs and WANs.		X					
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #4 Periodic Maintenance Perform periodic maintenance on routers by logging into the console port and testing IOS, the configuration file, and the status of each interface.		X		X	X		X
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #5 Troubleshooting Troubleshoot malfunctioning routers by examining the status of the POST test, the interface status, the IP status, and the status of the time-to-live facility.		X	X				
CIS 142 Local Area Network (LAN) Switching and Wireless CISCO 3: SLO #6 New Version of CISCO Download and install a new version of the CISCO Internetworking Operating system software.		X					
CIS 143 Access the WAN CISCO 4: SLO #1 Internet Working Modules Define and discuss internetworking models. Determine appropriate paths for internetworking.		X					
CIS 143 Access the WAN CISCO 4: SLO #2 User Interfaces Install user interfaces.		X					
CIS 143 Access the WAN CISCO 4: SLO #3 Router Issues List basic router issues. Describe serial connections for wide area networking. Auto install router configurations.		X		X	X		X
CIS 143 Access the WAN CISCO 4: SLO #4 Configuring Routers Configure hardware and software for routers to use both LAN and WAN protocols.		X					
CIS 143 Access the WAN CISCO 4: SLO #5 Configuring Protocols Configure TCP/IP and AppleTalk protocols. Manage traffic with access lists.		X					

SLOs	SLO to PLO Alignment *(Mark with an X)*			COURSE to ILO Alignment *(Mark with an X)*			
	P1	P2	P3	1	2	3	4
CIS 16 Application Development and Programming using Visual Basic.Net: SLO #1 Creating an Interface Creating an application using the fundamental concepts and models of application development including program design techniques, data structures, programming, problem solving and programming and business function logic.			X				
CIS 16 Application Development and Programming using Visual Basic.Net: SLO #2 Application Development Demonstrate well-written, logical, and readable programs using a disciplined coding system and professional project planning and management methodology, including requirements document, event planning, flow charts, site maps, timelines, Gantt charts, data diagrams, user case documents, testing and debugging.			X				
CIS 16 Application Development and Programming using Visual Basic.Net: SLO #3 Software Development Environment Identify and describe issues involved with software development including ethical conduct, business strategies, social media use, copyright laws and business practices.	X			X	X		X
CIS 16 Application Development and Programming using Visual Basic.Net: SLO #4 Data Driven Application Create an application utilizing a database to store, modify, delete and retrieve database information for viewing and decision making.			X				
CIS 18 Systems Analysis and Design: SLO #1 Interview Techniques Use effective interview techniques to gain an understanding of the company computer system's current data inputs, outputs, and processes.			X				
CIS 18 Systems Analysis and Design: SLO #2 Graphical Models Understand how 1) data flow diagrams visually illustrate the way data moves through a company's information system, and 2) entity-relationship diagrams serve as a graphical model that depict the relationships among the entities of a company's information system.			X	X	X		X
CIS 18 Systems Analysis and Design: SLO #3 Logical Design Documents Prepare logical design documentation for a company's new or modified computer system that includes a systems requirements document and a systems design specification.			X				
CIS 19 Internet, Security, and Web: SLO #1 Web Sites Compare and contrast the Internet from its original text-based web sites to current and collaborative interactive web sites.			X				
CIS 19 Internet, Security, and Web: SLO #2 Security Analyze the features of a secure website and create secure browser settings.			X	X	X		X
CIS 19 Internet, Security, and Web: SLO #3 Attacks Assess the likelihood of an attack on a local area network and set up a recovery plan.		X	X				
CIS 19 Internet, Security, and Web: SLO #4 Fraud Demonstrate an understanding of fraud and identity theft and its counter measures.		X	X				
CIS 20 Microsoft Windows: SLO #1 Functions Understand functions of Start menu, Restore Points, and system-level rights of Administrators and Users Accounts with rights and privileges.		X					
CIS 20 Microsoft Windows: SLO #2 Maintenance Given an in-class assignment, set and name restore points, defragment a hard drive, delete cookies, and create users accounts.		X					
CIS 20 Microsoft Windows: SLO #3 Effects of Malware Understand effects of malware and appropriate countermeasures; demonstrate ability to perform backup and restore procedures.		X	X	X	X		X
CIS 20 Microsoft Windows: SLO #4 Security Software Given an in-class assignment, download, install, and execute security software.		X					
CIS 26 Using Microsoft Excel: SLO #1 Spreadsheets Given an in-class assignment, construct an accurate and complete spreadsheet that demonstrates appropriate formatting and fundamental math calculations.			X				
CIS 26 Using Microsoft Excel: SLO #2 External References Given an in-class assignment, construct an accurate and complete spreadsheet that demonstrates math calculations AND LOOKUPS THAT INCLUDE EXTERNAL REFERENCES.			X				
CIS 26 Using Microsoft Excel: SLO #3 Conditional Formatting Given an in-class assignment, modify an existing spreadsheet to include conditional numeric formatting involving mathematical states (positive, negative and zero), and conditional logic involving day and time calculations.			X				
CIS 26 Using Microsoft Excel: SLO #4 Testing for Logic and Errors Given an in-class assignment, demonstrate proficiency in array processing of spreadsheet formulas, table structures, and database ("D") functions.			X	X	X		X
CIS 26 Using Microsoft Excel: SLO #5 Spreadsheet Formulas Demonstrate comprehension of spreadsheet formulas, functions, internal and external referencing, range naming, charting, absolute and relative referencing, and conditional formatting.			X				
CIS 26 Using Microsoft Excel: SLO #6 Spreadsheet Operations Demonstrate comprehension of multi-dimensional table structures, basic macro construction, and consolidations by name and by position.			X				

SLOs	SLO to PLO Alignment *(Mark with an X)*			COURSE to ILO Alignment *(Mark with an X)*			
	P1	P2	P3	1	2	3	4
CIS 27 Using Spreadsheet Macros: SLO #1 Decision Support Tools Given an in-class assignment, construct accurate and complete spreadsheets that that utilize Decision Support Tools, what-ifs, the Scenario Manager, and Regression Analysis.	X	X	X				
CIS 27 Using Spreadsheet Macros: SLO #2 Pivot Tables and Charts Given an in-class assignment, construct accurate and complete spreadsheets that utilize Pivot Tables and Pivot Charts.			X				
CIS 27 Using Spreadsheet Macros: SLO #3 Atypical Charts Given an in-class assignment, construct accurate and complete spreadsheets that display atypical charts to include radar, surface, and doughnut; understand values in formulas taken to nth power.			X	X	X		X
CIS 27 Using Spreadsheet Macros: SLO #4 Error Correction in Finance and Databases Given an in-class assignment, construct an accurate and complete spreadsheet that utilizes Error Correction, and advanced functions in the categories of Finance and Databases.	X	X	X				
CIS 28 Database Management using Microsoft Access: SLO #1 Concepts and Terms Understand database concepts and terminology.		X					
CIS 28 Database Management using Microsoft Access: SLO #2 Table Structures Design, create, and modify table structures and relationships. Modify tables to include default values, validation rules, input masks, and indices.		X	X				
CIS 28 Database Management using Microsoft Access: SLO #3 Queries Create single-table and multi-table queries. Use queries to perform calculations on data contained in tables.		X	X	X	X		X
CIS 28 Database Management using Microsoft Access: SLO #4 Creating Forms Create forms for viewing, entering, and editing data.		X					
CIS 29 Advanced Database Applications: SLO #1 Tables Import and export tables for use in a database design.		X					
CIS 29 Advanced Database Applications: SLO #2 Queries Create and modify complex, multi-table and crosstab queries.		X	X				
CIS 29 Advanced Database Applications: SLO #3 Forms Create and customize complex forms for capturing and reporting. Use Forms as a menu system.		X	X	X	X		X
CIS 29 Advanced Database Applications: SLO #4 Macros Create and run Macros.		X	X				
CIS 29 Advanced Database Applications: SLO #5 Design Design and develop a working database using Access.		X	X				
CIS 3 Introduction to Microcomputer and Software Applications: SLO #1 Basic Windows Operations Students will be able to utilize Windows using files, folders and drives.		X					
CIS 3 Introduction to Microcomputer and Software Applications: SLO #2 Basic Word Processing Students will be able to create, save, copy and format a word processing document.		X		X	X		X
CIS 3 Introduction to Microcomputer and Software Applications: SLO #3 Basic Spreadsheet Usage Students will be able to create a spreadsheet, create formulas, use functions and format tools and create and format charts.		X					
CIS 30 Introduction to eCommerce: SLO #1 e-Business Plan By the end of the course, students will develop and present a business plan for an eCommerce company with the functionality of selling goods or services.			X				
CIS 30 Introduction to eCommerce: SLO #2 Mobile Compare and contrast various mobile technologies that are currently being used to conduct online business.			X	X	X		X
CIS 30 Introduction to eCommerce: SLO #3 Software Understand the basic and advanced functions of eCommerce software.		X					
CIS 40 Personal Computer Operations: SLO #1 Terminology Examine operating systems terminology and technologies as they apply to microcomputers.		X					
CIS 40 Personal Computer Operations: SLO #2 PC Boot Problems Students will be able to solve a PC boot problem, given a set of circumstances that occur once the power button is pressed. Using a BIOS software troubleshooting flowchart, they will be able to determine which BIOS process is causing the failure.		X	X	X	X		X
CIS 40 Personal Computer Operations: SLO #3 Installation Students will be able to install a windows operating system. They will install the operating system, service packs, video and audio drivers, and configure the hardware resources.		X	X				
CIS 80 Oracle Application Programming: SLO #1 Tables and Relationships Design and develop tables and relationships for common business problems.		X					
CIS 80 Oracle Application Programming: SLO #2 Tables Create and process tables.		X					
CIS 80 Oracle Application Programming: SLO #3 Solving Common Business Problems Solve common business oriented problems by using an application programming language to access database for answers to common business queries.		X	X	X	X		X
CIS 80 Oracle Application Programming: SLO #4 Conditional Statements Develop conditional statements and multiple level "if" statements to query database tables.		X	X				
CIS 80 Oracle Application Programming: SLO #5 Program Code Write programming code to manipulate database tables.			X				
CIS 80 Oracle Application Programming: SLO #6 Efficient Programming Techniques Demonstrate use of efficient programming techniques.			X				

4b) Timeline for course and program level SLO assessments

PLO ASSESSMENT 4-YEAR TIMELINE REPORT

ECC - BUSINESS DIVISION

PLO Assessment Cycle	Unit Name	PLO Name	PLO
2014-15 (Spring 2015)	El Camino: PLOs (BUS) - Computer Information Systems	PLO #1 Professional Awareness	Students will be able to explain ethical, legal, and societal implications inherent in information technology and understand the professional responsibilities of a computer professional.
2015-16 (Spring 2016)	El Camino: PLOs (BUS) - Computer Information Systems	PLO #2 Business Communication	Upon the completion of a course of study in Computer Information Systems students will be able to demonstrate proficiency in common industry software applications, cyber applications and Network security to effectively analyze business problems and communicate decisions.
2016-17 (Summer 2017)	El Camino: PLOs (BUS) - Computer Information Systems	PLO #3 Skill Development	Upon the completion of a course of study in Computer Information Systems students will be able to demonstrate the ability to use computer information concepts and critical thinking skills to analyze business problems, and design, develop and implement appropriate software solutions, using a variety of software tools and computer languages.

COURSE SLO ASSESSMENT 4-YEAR TIMELINE REPORT (ECC)

BUSINESS DIVISION - COMPUTER INFORMATION SYSTEMS

Course SLO Assessment Cycle	Course ID	Course Name	Course SLO Title	Course SLO Statement
2013-14 (Spring 2014)	ECC: CIS 11	Help Desk Operations	SLO #1 Dealing with Customers	Identify the communication strategies to build rapport and trust with customers and the proven techniques to handle irate, difficult and demanding customers.
2013-14 (Spring 2014)	ECC: CIS 11	Help Desk Operations	SLO #2 Help Desk Operations	Identify the major steps in the incident Management process.
2013-14 (Spring 2014)	ECC: CIS 11	Help Desk Operations	SLO #6 Professional Protocol	Understand the mission of the help desk in an organization, and the professional responsibilities and skills required of a help desk technician.
2013-14 (Spring 2014)	ECC: CIS 13	Computer Information Systems	SLO #2 Applicability	Demonstrate an understanding of the system development process and use of information systems within an organization.
2013-14 (Spring 2014)	ECC: CIS 133	Mashup JavaScript, jQuery and AJAX	SLO #1 Fundamental Concepts of Client-Side Programming	Students will demonstrate their ability to bring excitement to web pages using the fundamental components in the JavaScript programming language, including form data validation techniques, event handling using functions, timers, and control structures, repetitive programming methods, objects and object models, and the jQuery library.
2013-14 (Spring 2014)	ECC: CIS 140	Data Communications CISCO 1	SLO #1 Data Communication Terms	Describe and explain data communication terms such as broadband and baseband communications
2013-14 (Spring 2014)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #1 Connection and Connection-less Oriented Networks	Describe connection-oriented network services and connectionless-oriented network services and identify their key differences.
2013-14 (Spring 2014)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #1 Router Components	Identify router components such as Ethernet and Serial Interfaces, Console and Auxiliary ports, Ram, NVRam, and Rom memory
2013-14 (Spring 2014)	ECC: CIS 16	Introduction to Visual Basic	SLO #1 Creating an Interface	Creating an application using the fundamental concepts and models of application development including program design techniques, data structures, programming, problem solving and programming and business function logic.
2013-14 (Spring 2014)	ECC: CIS 16	Introduction to Visual Basic	SLO #2 Application Development	Demonstrate well-written, logical, and readable programs using a disciplined coding system and professional project planning and management methodology, including requirements document, event planning, flow charts, site maps, timelines, Gantt charts, data diagrams, user case documents, testing and debugging
2013-14 (Spring 2014)	ECC: CIS 18	Systems Analysis and Design	SLO #1 Interview Techniques	Use effective interview techniques to gain an understanding of the company computer system's current data inputs, outputs, and processes.
2013-14 (Spring 2014)	ECC: CIS 19	Introduction to the Internet and Web Publishing	SLO #1 Web Sites	Compare and contrast the Internet from its original text-based web sites to current and collaborative interactive web sites.

2013-14 (Spring 2014)	ECC: CIS 26	Using Microsoft Excel	SLO #1 Spreadsheets	Given an in-class assignment, construct an accurate and complete spreadsheet that demonstrates appropriate formatting and fundamental math calculations
2013-14 (Spring 2014)	ECC: CIS 28	Database Management using Microsoft Access	SLO #1 Concepts and Terms	Understand database concepts and terminology
2013-14 (Spring 2014)	ECC: CIS 28	Database Management using Microsoft Access	SLO #2 Table Structures	Design, create, and modify table structures and relationships. Modify tables to include default values, validation rules, input masks, and indices
2013-14 (Spring 2014)	ECC: CIS 30	Introduction to eCommerce	SLO #1 e-Business Plan	By the end of the course, students will develop and present a Business plan for an Ecommerce Company with the functionality of selling goods or services
2013-14 (Spring 2014)	ECC: CIS 30	Introduction to eCommerce	SLO #2 Mobile	Compare and Contrast various Mobile Technologies that are currently being used to conduct online business.
2013-14 (Spring 2014)	ECC: CIS 30	Introduction to eCommerce	SLO #3 Software	Understand the basic and advanced functions of eCommerce Software
2014-15 (Fall 2014)	ECC: CIS 13	Computer Information Systems	SLO #1 Applicability	Solve common business problems using appropriate information technology applications and systems design and developmental tools.
2014-15 (Fall 2014)	ECC: CIS 136	Building Mobile Apps	SLO #1 Understanding Mobile Frameworks	Students will be understand the different types of application frameworks used to develop mobile applications.
2014-15 (Fall 2014)	ECC: CIS 136	Building Mobile Apps	SLO #2 Designing Mobile User Interfaces	Students will be able to design and create effective mobile application user interfaces.
2014-15 (Fall 2014)	ECC: CIS 140	Data Communications CISCO 1	SLO #2 Modulation Techniques	Describe and use different modulation techniques such as time-division and frequency division.
2014-15 (Fall 2014)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #2 Basic Methods	Define flow control and describe the three basic methods used in connection oriented networking.
2014-15 (Fall 2014)	ECC: CIS 143	LAN and WAN Router Configurations CISCO 4	SLO #1 Internet Working Modules	Define and discuss internetworking models. Determine appropriate paths for internetworking
2014-15 (Fall 2014)	ECC: CIS 143	LAN and WAN Router Configurations CISCO 4	SLO #2 User Interfaces	Install user interfaces.
2014-15 (Fall 2014)	ECC: CIS 143	LAN and WAN Router Configurations CISCO 4	SLO #3 Router Issues	List basic router issues. Describe serial connections for wide area networking. Auto install router configurations
2014-15 (Fall 2014)	ECC: CIS 18	Systems Analysis and Design	SLO #2 Graphical Models	Understand how 1) data flow diagrams visually illustrate the way data moves through a company's information system, and 2) entity-relationship diagrams serve as a graphical model that depict the relationships among the entities of a company's information system.
2014-15 (Fall 2014)	ECC: CIS 19	Introduction to the Internet and Web Publishing	SLO #2 Security	Analyze the features of a secure website and create secure browser settings.
2014-15 (Fall 2014)	ECC: CIS 26	Using Microsoft Excel	SLO #2 External References	Given an in-class assignment, construct an accurate and complete spreadsheet that demonstrates appropriate formatting and fundamental math calculations

Course SLO Assessment Cycle	Course ID	Course Name	Course SLO Title	Course SLO Statement
2014-15 (Fall 2014)	ECC: CIS 28	Database Management using Microsoft Access	SLO #3 Queries	Create single-table and multi-table queries. Use queries to perform calculations on data contained in tables.
2014-15 (Fall 2014)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #1 Basic Windows Operations	Students will be able to utilize Windows, using files, folders and drives
2014-15 (Fall 2014)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #2 Basic Word Processing	Students will be able to create, save, copy and format a word processing document.
2014-15 (Fall 2014)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #3 Basic Spreadsheet Usage	Students will be able to create a spreadsheet, create formulas, use functions and format tools and create and format charts.
2014-15 (Fall 2014)	ECC: CIS 40	Personal Computer Operations	SLO #1 Terminology	Examine operating systems terminology and technologies as they apply to microcomputers.
2014-15 (Fall 2014)	ECC: CIS 40	Personal Computer Operations	SLO #2 PC Boot Problems	Students will be able to solve a PC boot problem, given a set of circumstances that occur once the power button is pressed. Using a BIOS software troubleshooting flowchart, they will be able to determine which BIOS process is causing the failure.
2014-15 (Fall 2014)	ECC: CIS 40	Personal Computer Operations	SLO #3 Installation	Students will be able to install a windows operating system.. They will install the operating system, service packs, video and audio drivers, and configure the hardware resources.
2014-15 (Spring 2015)	ECC: CIS 11	Help Desk Operations	SLO #3 Technical Writing	Develop and create examples of end-user support documentation using enhancements including diagrams, images, and screen captures in order to produce user guides and FAQs.
2014-15 (Spring 2015)	ECC: CIS 13	Computer Information Systems	SLO #3 Communications	Identify and analyze existing and emerging technologies and their impact on organizations and society including communication and global relationships.
2014-15 (Spring 2015)	ECC: CIS 133	Mashup JavaScript, jQuery and AJAX	SLO #2 Incorporating Data in Client-Side Programs	Students will demonstrate their ability to incorporate client side data storage and transmission techniques using cookies, hidden form fields, querystrings, eXtensible Markup language (XML), JavaScript Object Notation (JSON), and Asynchronous JavaScript and XML (AJAX).
2014-15 (Spring 2015)	ECC: CIS 140	Data Communications CISCO 1	SLO #3 Network Systems	Analyze and design network systems using differing transmission methods such as copper wire, fiber optics, microwave and satellite.
2014-15 (Spring 2015)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #3 Functions of the TCP/IP	Identify the functions of the TCP/IP transport-layer protocols.
2014-15 (Spring 2015)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #2 Router Hardware Configuration	Create valid router hardware configurations using proper router protocols, IP addressing, interface addressing, and network address identification.
2014-15 (Spring 2015)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #3 Router Design of LANs and WANs	Install and configure routers for design of LANs and WANs.
2014-15 (Spring 2015)	ECC: CIS 16	Introduction to Visual Basic	SLO #3 Software Development Environment	Identify and describe issues involved with software development including ethical conduct, business strategies, social media use,

				copyright laws and business practices.
2014-15 (Spring 2015)	ECC: CIS 16	Introduction to Visual Basic	SLO #4 Data Driven Application	Create an application utilizing a database to store, modify, delete and retrieve database information for viewing and decision making.
2014-15 (Spring 2015)	ECC: CIS 18	Systems Analysis and Design	SLO #3 Logical Design Documents	Prepare logical design documentation for a company's new or modified computer system that includes a systems requirements document and a systems design specification.
2014-15 (Spring 2015)	ECC: CIS 26	Using Microsoft Excel	SLO #3 Conditional Formatting	Given an in-class assignment, modify an existing spreadsheet to include conditional numeric formatting involving mathematical states (positive, negative and zero), and conditional logic involving day and time calculations.
2014-15 (Spring 2015)	ECC: CIS 26	Using Microsoft Excel	SLO #6 Spreadsheet Operations	Demonstrate comprehension of multi-dimensional table structures, basic macro construction, and consolidations by name and by position.
2014-15 (Spring 2015)	ECC: CIS 80	Oracle Application Programming	SLO #1 Tables and Relationships	Design and develop tables and relationships for common business problems.
2014-15 (Spring 2015)	ECC: CIS 80	Oracle Application Programming	SLO #2 Tables	Create and process tables.
2014-15 (Spring 2015)	ECC: CIS 80	Oracle Application Programming	SLO #3 Solving Common Business Problems	Solve common business oriented problems by using an application programming language to access database for answers to common business queries.
2014-15 (Summer 2015)	ECC: CIS 11	Help Desk Operations	SLO #6 Professional Protocol	Understand the mission of the help desk in an organization, and the professional responsibilities and skills required of a help desk technician.
2015-16 (Fall 2015)	ECC: CIS 13	Computer Information Systems	SLO #4 Networking	Demonstrate knowledge of network configurations, risk management and security protocols.
2015-16 (Fall 2015)	ECC: CIS 134	ASP.NET with C# Business Web Programming	SLO #1 E-Commerce Site	The student will demonstrate the ability to create an e-commerce website using ASP.NET and C#. Given detailed specifications and example code, create a functioning e-commerce website that includes: a) a market-competitive user interface, b) a shopping cart, c) product recommendations, d) an order pipeline to follow the order process, e) a database which includes customers, products with product attributes, orders,audit, order, inventory, and product recommendation information, and search capability
2015-16 (Fall 2015)	ECC: CIS 134	ASP.NET with C# Business Web Programming	SLO #2 SQL, C# and ASP.NET	Demonstrate knowledge of e-commerce development programming language usage.
2015-16 (Fall 2015)	ECC: CIS 136	Building Mobile Apps	SLO #3 Developing Mobile Applications	Students will be able to architect, develop, test, and debug mobile applications that display various types of digital media, manage data, and use the native features of a mobile device.
2015-16 (Fall 2015)	ECC: CIS 140	Data Communications CISCO 1	SLO #4 Communications with the Internet	Use microcomputer hardware and software to facilitate communications with the Internet. Describe how microcomputer hardware relates to data communications. Analyze security issues such as protections, detection and correction

Course SLO Assessment Cycle	Course ID	Course Name	Course SLO Title	Course SLO Statement
2015-16 (Fall 2015)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #4 Comparing Protocols	Compare TCP/IP protocols to the ISO reference model layer four.
2015-16 (Fall 2015)	ECC: CIS 143	LAN and WAN Router Configurations CISCO 4	SLO #4 Configuring Routers	Configure hardware and software for routers to use both LAN and WAN protocols.
2015-16 (Fall 2015)	ECC: CIS 143	LAN and WAN Router Configurations CISCO 4	SLO #5 Configuring Protocols	Configure TCP/IP and AppleTalk protocols. Manage traffic with access lists
2015-16 (Fall 2015)	ECC: CIS 18	Systems Analysis and Design	SLO #1 Interview Techniques	Use effective interview techniques to gain an understanding of the company computer system's current data inputs, outputs, and processes.
2015-16 (Fall 2015)	ECC: CIS 19	Introduction to the Internet and Web Publishing	SLO #3 Attacks	Assess the likelihood of an attack on a local area network and set up a recovery plan.
2015-16 (Fall 2015)	ECC: CIS 26	Using Microsoft Excel	SLO #4 Testing for Logic and Errors	Given an in-class assignment, demonstrate proficiency in array processing of spreadsheet formulas, table structures, and database ("D") functions.
2015-16 (Fall 2015)	ECC: CIS 40	Personal Computer Operations	SLO #1 Terminology	Examine operating systems terminology and technologies as they apply to microcomputers.
2015-16 (Spring 2016)	ECC: CIS 11	Help Desk Operations	SLO #5 Management	Understand and evaluate the needs of the users in an organization, the cost and benefit of fulfilling the needs, and the staffing and training of the help desk to properly support the organization.
2015-16 (Spring 2016)	ECC: CIS 13	Computer Information Systems	SLO #2 Applicability	Demonstrate an understanding of the system development process and use of information systems within an organization.
2015-16 (Spring 2016)	ECC: CIS 133	Mashup JavaScript, jQuery and AJAX	SLO #3 Developing a Software Application for the Web	Students will demonstrate the ability to create an e-commerce website that includes a fully functioning shopping cart and checkout/payment process, using a web development approach that incorporates planning, designing, coding, testing, and publishing to a web server.
2015-16 (Spring 2016)	ECC: CIS 140	Data Communications CISCO 1	SLO #5 Local and Wide Area Networks	Describe and define the similarities and differences between local area and wide area networks.
2015-16 (Spring 2016)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #5 ICMP Functions	Identify the functions performed by ICMP.
2015-16 (Spring 2016)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #4 Periodic Maintenance	Perform periodic maintenance on routers by logging into the console port and testing IOS, the configuration file, and the status of each interface
2015-16 (Spring 2016)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #5 Troubleshooting	Troubleshoot malfunctioning routers by examining the status of the POST test, the interface status, the IP status, and the status of the time-to-live facility.
2015-16 (Spring 2016)	ECC: CIS 142	Implementing and Administering Network Routers CISCO 3	SLO #6 New Version of Cisco	Download and install a new version of the Cisco Internetworking Operating system software.
2015-16 (Spring 2016)	ECC: CIS 18	Systems Analysis and Design	SLO #2 Graphical Models	Understand how 1) data flow diagrams visually illustrate the way data moves through a company's information system, and 2) entity-relationship diagrams serve as a graphical model that depict the

				relationships among the entities of a company's information system.
2015-16 (Spring 2016)	ECC: CIS 19	Introduction to the Internet and Web Publishing	SLO #4 Fraud	Demonstrate an understanding of fraud and identity theft and its counter measures.
2015-16 (Spring 2016)	ECC: CIS 26	Using Microsoft Excel	SLO #1 Spreadsheets	Given an in-class assignment, construct an accurate and complete spreadsheet that demonstrates appropriate formatting and fundamental math calculations
2015-16 (Spring 2016)	ECC: CIS 26	Using Microsoft Excel	SLO #5 Spreadsheet Formulas	Demonstrate comprehension of spreadsheet formulas, functions, internal and external referencing, range naming, charting, absolute and relative referencing, and conditional formatting.
2015-16 (Spring 2016)	ECC: CIS 28	Database Management using Microsoft Access	SLO #1 Concepts and Terms	Understand database concepts and terminology
2015-16 (Spring 2016)	ECC: CIS 30	Introduction to eCommerce	SLO #1 e-Business Plan	By the end of the course, students will develop and present a Business plan for an Ecommerce Company with the functionality of selling goods or services
2016-17 (Fall 2016)	ECC: CIS 11	Help Desk Operations	SLO #4 Managing Knowledge Resources	Demonstrate the use of software tools used to manage knowledge resources relating to end-user technical support.
2016-17 (Fall 2016)	ECC: CIS 13	Computer Information Systems	SLO #1 Applicability	Solve common business problems using appropriate information technology applications and systems design and developmental tools.
2016-17 (Fall 2016)	ECC: CIS 28	Database Management using Microsoft Access	SLO #3 Queries	Create single-table and multi-table queries. Use queries to perform calculations on data contained in tables.
2016-17 (Fall 2016)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #1 Basic Windows Operations	Students will be able to utilize Windows, using files, folders and drives
2016-17 (Fall 2016)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #2 Basic Word Processing	Students will be able to create, save, copy and format a word processing document.
2016-17 (Fall 2016)	ECC: CIS 3	Introduction to Microcomputer and Software Applications	SLO #3 Basic Spreadsheet Usage	Students will be able to create a spreadsheet, create formulas, use functions and format tools and create and format charts.
2016-17 (Fall 2016)	ECC: CIS 40	Personal Computer Operations	SLO #2 PC Boot Problems	Students will be able to solve a PC boot problem, given a set of circumstances that occur once the power button is pressed. Using a BIOS software troubleshooting flowchart, they will be able to determine which BIOS process is causing the failure.
2016-17 (Fall 2016)	ECC: CIS 40	Personal Computer Operations	SLO #3 Installation	Students will be able to install a windows operating system.. They will install the operating system, service packs, video and audio drivers, and configure the hardware resources.
2016-17 (Spring 2017)	ECC: CIS 133	Mashup JavaScript, jQuery and AJAX	SLO #1 Fundamental Concepts of Client-Side Programming	Students will demonstrate their ability to bring excitement to web pages using the fundamental components in the JavaScript programming language, including form data validation techniques, event handling using functions, timers, and control structures, repetitive programming methods, objects and object models, and the jQuery library.

Course SLO Assessment Cycle	Course ID	Course Name	Course SLO Title	Course SLO Statement
2016-17 (Spring 2017)	ECC: CIS 141	Networking Microcomputers CISCO 2	SLO #6 Routing Type Problems	List problems that each routing type encounters when dealing with topology changes, and describe techniques used to reduce the number of these problems.
2016-17 (Spring 2017)	ECC: CIS 16	Introduction to Visual Basic	SLO #2 Application Development	Demonstrate well-written, logical, and readable programs using a disciplined coding system and professional project planning and management methodology, including requirements document, event planning, flow charts, site maps, timelines, Gantt charts, data diagrams, user case documents, testing and debugging
2016-17 (Spring 2017)	ECC: CIS 16	Introduction to Visual Basic	SLO #4 Data Driven Application	Create an application utilizing a database to store, modify, delete and retrieve database information for viewing and decision making.
2016-17 (Spring 2017)	ECC: CIS 26	Using Microsoft Excel	SLO #6 Spreadsheet Operations	Demonstrate comprehension of multi-dimensional table structures, basic macro construction, and consolidations by name and by position.
2016-17 (Spring 2017)	ECC: CIS 28	Database Management using Microsoft Access	SLO #2 Table Structures	Design, create, and modify table structures and relationships. Modify tables to include default values, validation rules, input masks, and indices
2016-17 (Spring 2017)	ECC: CIS 29	Advanced Database Applications	SLO #1 Tables	Import and export tables for use in a database design.
2016-17 (Spring 2017)	ECC: CIS 29	Advanced Database Applications	SLO #2 Queries	Create complex Queries Create and modify complex, multi-table and crosstab queries
2016-17 (Spring 2017)	ECC: CIS 29	Advanced Database Applications	SLO #3 Forms	Create and customize complex forms for capturing and reporting. Use Forms as a menu system
2016-17 (Spring 2017)	ECC: CIS 29	Advanced Database Applications	SLO #4 Macros	Running MACROS Create and run MACROS
2016-17 (Spring 2017)	ECC: CIS 29	Advanced Database Applications	SLO #5 Design	Using Access Design and develop a working database using Access
2016-17 (Spring 2017)	ECC: CIS 30	Introduction to eCommerce	SLO #2 Mobile	Compare and Contrast various Mobile Technologies that are currently being used to conduct online business.
2016-17 (Spring 2017)	ECC: CIS 80	Oracle Application Programming	SLO #4 Conditional Statements	Develop conditional statements and multiple level "if" statements to query database tables.
2016-17 (Spring 2017)	ECC: CIS 80	Oracle Application Programming	SLO #5 Program Code	Write programming code to manipulate database tables.
2016-17 (Spring 2017)	ECC: CIS 80	Oracle Application Programming	SLO #6 Efficient Programming Techniques	Demonstrate use of efficient programming techniques.
2016-17 (Summer 2017)	ECC: CIS 13	Computer Information Systems	SLO #3 Communications	Identify and analyze existing and emerging technologies and their impact on organizations and society including communication and global relationships.
2016-17 (Summer 2017)	ECC: CIS 30	Introduction to eCommerce	SLO #3 Software	Understand the basic and advanced functions of eCommerce Software
2017-18 (Fall 2017)	ECC: CIS 11	Help Desk Operations	SLO #2 Help Desk Operations	Identify the major steps in the incident Management process.

2017-18 (Fall 2017)	ECC: CIS 134	ASP.NET with C# Business Web Programming	SLO #3 Website Planning	Demonstrate project design and management of a complete e-commerce website including the use of requirements document, database and class diagrams, use case definitions, flowcharts, cross-functional flowcharts, site maps, user controls, classes and timelines
2017-18 (Fall 2017)	ECC: CIS 136	Building Mobile Apps	SLO #4 Marketing Mobile Applications	Students will understand how to deploy a mobile app to the app marketplace.
2017-18 (Fall 2017)	ECC: CIS 140	Data Communications CISCO 1	SLO #6 Ethical Considerations	Identify ethical considerations such as privacy, hacking, and piracy.
2017-18 (Fall 2017)	ECC: CIS 28	Database Management using Microsoft Access	SLO #4 Creating Forms	Create forms for viewing, entering, and editing data.

4c) Percent of course and program SLO statements that have been assessed

Due to software issues, and the lack of available data, the Associate Dean of Academic Affairs suggested that the CIS Department only use the three semesters (2013 fall through 2014 fall) when commenting in sections 4c through 4e.

The graphic below lists all of the SLOs that were scheduled to be assessed from 2013 fall through 2014 fall. The unformatted cells represent those courses/SLOs that were scheduled and assessed as scheduled. The cells formatted in blue (digital version) or outlined in bold black (printed version) represent those courses/SLOs that were assessed without being scheduled. The cells formatted in red (digital version) or outlined in dashed black (printed version) represent those courses/SLOs that were scheduled, but not assessed.

Course	SLO #	2013 Fall	2014 Spring	2014 Fall
CIS 13	1	2013 Fall		2014 Fall
CIS 13	2	2013 Fall	2014 Spring	2014 Fall
CIS 13	3	2013 Fall		2014 Fall
CIS 13	4	2013 Fall		2014 Fall
CIS 133	1		2014 Spring	2014 Fall
CIS 133	2		2014 Spring	2014 Fall
CIS 133	3		2014 Spring	2014 Fall
CIS 140	1		2014 Spring	2014 Fall
CIS 140	2			2014 Fall
CIS 140	3			2014 Fall
CIS 140	4			2014 Fall
CIS 143	1			2014 Fall
CIS 143	2			2014 Fall
CIS 143	3			2014 Fall
CIS 143	4			2014 Fall
CIS 143	5			2014 Fall
CIS 18	1		2014 Spring	2014 Fall
CIS 18	2			2014 Fall
CIS 18	3			2014 Fall
CIS 19	1		2014 Spring	2014 Fall
CIS 19	2			2014 Fall
CIS 19	3			2014 Fall

CIS 19	4			2014 Fall
CIS 26	1		2014 Spring	2014 Fall
CIS 26	2			2014 Fall
CIS 26	3			2014 Fall
CIS 26	4			2014 Fall
CIS 26	5			2014 Fall
CIS 26	6			2014 Fall
CIS 28	1		2014 Spring	2014 Fall
CIS 28	2		2014 Spring	2014 Fall
CIS 28	3			2014 Fall
CIS 28	4			2014 Fall
CIS 3	1			2014 Fall
CIS 3	2			2014 Fall
CIS 3	3			2014 Fall
CIS 40	1			2014 Fall
CIS 40	2			2014 Fall
CIS 40	3			2014 Fall
CIS 11	1		2014 Spring	
CIS 11	2		2014 Spring	
CIS 11	6		2014 Spring	
CIS 134	1	2013 Fall		
CIS 134	2	2013 Fall		
CIS 134	3	2013 Fall		
CIS 136	1			
CIS 136	2			
CIS 141	1		2014 Spring	
CIS 141	2			
CIS 142	1		2014 Spring	
CIS 16	1			
CIS 16	2			
CIS 20	Inactive			
CIS 27	Inactive			
CIS 29	Not offered			
CIS 30	1		2014 Spring	
CIS 30	2		2014 Spring	
CIS 30	3		2014 Spring	
CIS 80	Not offered			

Source: TracDat

Throughout the three semester period a total of forty-three SLOs were scheduled to be assessed. Thirty-eight of the forty-three scheduled SLOs were assessed for the semester in which they were originally scheduled. The breakdown of the five SLOs that were not assessed as originally scheduled follows:

CIS 136 (2014 fall); To get into a proper course rotation, CIS 136 was moved to the 2015 spring semester.

CIS 141 (2014 fall); Class was cancelled.

CIS 16 (2014 spring); This class was started by an instructor who was terminated on March 15th of 2014. A different instructor finished the class and then retired at the end of the semester. The retiring instructor never completed the assessments for the 2 SLOs.

An additional twenty-six SLOs were assessed without being scheduled primarily because the CIS Department assessed every SLO in every course that was offered during the 2014 fall semester in order to establish a baseline.

PLO #1 was scheduled to be assessed after the time frame of this program review.

4d) Summarize the SLO and PLO assessment results over the past four years and describe how those results led to improved student learning. Analyze and describe those changes. Provide specific examples.

Our department meets annually with our advisory committee for their input on industry trends, and the skills required of today's information technology employees.

All of our department's three PLOs were originally constructed, or later modified to relate directly to those things our advisory committee says are critical skills and concepts. These PLOs have led directly to our beginning the curriculum process of creating new courses in healthcare information, networking fundamentals and Cybersecurity, and certificates for Business Information Worker, Database Management, and Small Business Technical Support.

SLOs are an on-going process of setting, assessing, evaluating and modifying not only our SLOs, but the assessment methodologies used as well.

Most of the SLOs (ninety-one %) that were assessed during the time frame met or exceeded the standard. Of the remaining nine %, none of those six SLOs have been assessed again since the semester in which the standard was not met, so it is not yet possible to determine if any of our recommended changes led to increased student learning.

Among all courses there were two instances where the length of the course was deemed to be a contributing factor to lack of student success. An action item for CIS 141 stated that we should "extend the timeline for the curriculum to sixteen weeks instead of eight to provide more time to absorb and digest this complex curriculum". As a result the CIS department initiated curriculum changes that added the additional eight weeks to the course. An action item for CIS 3 stated that the "class needs to meet more often than once a week. Students can learn, and retain more information if the class met twice a week". Although CIS 3 has recently been inactivated, its successor course (CIS 2) is being offered twice a week.

In some cases we found that 1) the "SLO statement(s) need to be re-evaluated and re-defined to better describe goals" (source: CIS 11 SLO action item), or 2) "since 100%

of the class was successful in the assessment, a more rigorous assignment with more formulas will be constructed" (source: CIS 26 SLO action item). Both have been acted on.

Additionally we have followed up action items by "spending additional time throughout the semester reinforcing basic terminology and concepts" (CIS 28), and "increasing reinforcement through additional assignments, tests and quizzes" (CIS 40).

Hopefully the college will decide to stay with one software program (TracDat) to store SLO data. Then we will have enough data to determine by the next program review whether our recommendations have actually translated into increased student learning.

4e) Describe how you have improved your SLO process and engaged in dialogue about assessment results.

Two of the main forces that help keep our curriculum relevant are annual input from our advisory committee, and the constant process of assessing, evaluating and redefining (if necessary) our SLOs.

CIS 13 is our core introductory class that represents almost three-quarters of our enrollments each semester, and serves as a pre-requisite for many of our advanced classes. With this in mind, the department has decided to assess the CIS 13 class in a slightly different manner than in the past. Once yearly, all CIS 13 classes will have all of the associated SLOs assessed during the same semester. This will allow the assessment tool to be consistent from year to year. This method will also ensure that any deviations from the norms or difficulties encountered can be corrected quickly. Assessing an entire class at once allows for corrections to be instituted on a timelier basis.

4f) Related recommendations.

1. Because technology is changing so quickly, certain courses are impacted more than others. This is especially true in CIS. Faculty have found that changes to course content may be necessary each time the course is taught, regardless of a textbook change. As course content is revised, the SLO's associated with that course should also be modified based on our experiences.
2. Experiment with selected standard methods (videos, group discussions, etc.) to engage students in CIS 13.
3. Use standardized tests in CIS 13, or other classes with multiple sections so that the evaluation process from section to section has more consistency.

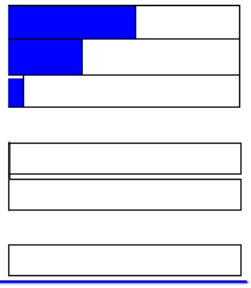
5. Analysis of Student Feedback

a. Results of student survey
   i. Student support
   ii. Curriculum
   iii. Facilities, Equipment, and Technology
   iv. Program objectives
b. Program implications of the survey results
c. Results of other relevant surveys
d. Related recommendations

5a-i) Student support

- Instructors in this program have helped me achieve my academic goals.

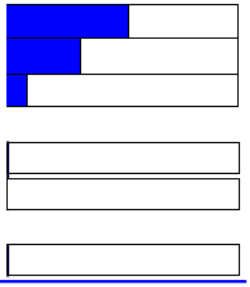
Response	Frequency	Percent
Strongly Agree	215	55.70
Agree	128	33.16
Neither Agree nor Disagree	30	7.77
Disagree	6	1.55
Strongly Disagree	4	1.04
Missing	3	0.78



It is reassuring to our department members that 88.86% of our students responded either Strongly Agree (55.70%) or Agree (33.16%) to this question, and less than 2% responded negatively.

- Instructors in this program have helped me stay on track.

Response	Frequency	Percent
Strongly Agree	207	53.63
Agree	127	32.90
Neither Agree nor Disagree	37	9.59
Disagree	6	1.55
Strongly Disagree	4	1.04
Missing	5	1.30



86.53% of our students responded either Strongly Agree (53.63%) or Agree (32.90%).

- Instructors in this program provide opportunities to actively participate in my classes.

Response	Frequency	Percent
Strongly Agree	205	53.11
Agree	126	32.64
Neither Agree nor Disagree	40	10.36
Disagree	8	2.07
Strongly Disagree	1	0.26
Missing	6	1.55

Although slightly lower than the previous two questions, the responses are in the mid to upper 80% (85.75%).

- I have felt a sense of community within this program.

Response	Frequency	Percent
Strongly Agree	150	38.86
Agree	121	31.35
Neither Agree nor Disagree	85	22.02
Disagree	21	5.44
Strongly Disagree	4	1.04
Missing	5	1.30

After the survey was administered a number of students stated that they weren't exactly sure what this question was asking. This is possibly reflected by a percentage (22.02%) of Neither Agree nor Disagree responses that was almost double that of the next highest Neither Agree nor Disagree response for the previous questions in the "Student Support" section.

- Student contributions have been valued by instructors in this program.

Response	Frequency	Percent
Strongly Agree	179	46.37
Agree	130	33.68
Neither Agree nor Disagree	55	14.25
Disagree	11	2.85
Strongly Disagree	4	1.04
Missing	7	1.81

Although still high, the positive response rate (80.05%) between Strongly Agree and Agree was the lowest in "Student Support" section.

5a-ii) Curriculum

- There is an appropriate range of courses offered in this program.

Response	Frequency	Percent
Strongly Agree	158	40.93
Agree	146	37.82
Neither Agree nor Disagree	60	15.54
Disagree	11	2.85
Strongly Disagree	6	1.55
Missing	5	1.30

The combined negative response rate was 4.40%. We are commenting here on the negative rate due to the sizeable number (15.54%) of Neither Agree nor Disagree responses that impact the positive percentages. We feel that these could be non-CIS majors who only need to take CIS 13 for their major, and are unaware of, or have no interest in the rest of the courses offered by the department.

- Courses were scheduled on days and times that were convenient to me.

  The graphics below indicate our student's responses to the following two questions; "If you were to take another CIS course, you would want it scheduled on", and "Your preferred time for starting a class is"

Response	Frequency	Percent
Once a week	64	16.58
Monday/Wednesday	154	39.90
Tuesday/Thursday	138	35.75
Monday/Wednesday/Friday	11	2.85
Weekend	17	4.40
Missing	2	0.52

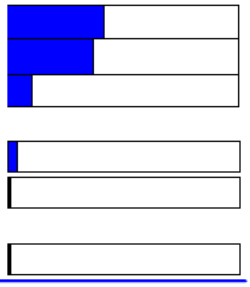
Response	Frequency	Percent
7am – 9 am	88	22.80
10am – 12 pm	171	44.30
1pm – 3 pm	39	10.10
3pm – 5pm	30	7.77
6pm – 7 pm	53	13.73
Missing	5	1.30

Over three-quarter of our students (75.7%) prefer classes that are scheduled twice a week, and over two-thirds of them (67.1%) prefer classes that start no later than noon.

The spring 2015 semester is typical in that 93.9% of the classes we offered were scheduled to meet twice a week. In addition, twenty-two of the thirty-three (66.7%) classes were scheduled to start no later than noon. Of the remaining eleven classes, eight of them were evening classes scheduled to accommodate our students who work during the day, and can only attend at night.

- I've been able to register for the classes I need within this program.

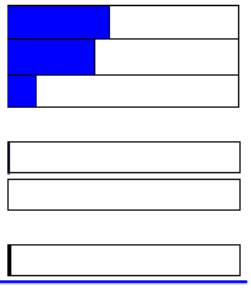
Response	Frequency	Percent
Strongly Agree	164	42.49
Agree	145	37.56
Neither Agree nor Disagree	45	11.66
Disagree	18	4.66
Strongly Disagree	7	1.81
Missing	7	1.81



42.49% strongly agreed, and another 37.56% agreed.

- The courses in this program have helped me meet my academic goals.

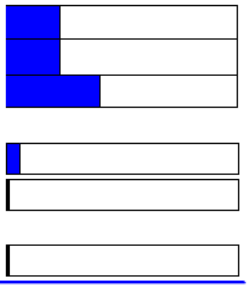
Response	Frequency	Percent
Strongly Agree	173	44.82
Agree	149	38.60
Neither Agree nor Disagree	49	12.69
Disagree	5	1.30
Strongly Disagree	2	0.52
Missing	8	2.07



83.42% of the students responded favorably (Strongly Agree or Agree).

- There is a variety of extracurricular activities related to this program on campus.

Response	Frequency	Percent
Strongly Agree	97	25.13
Agree	88	22.80
Neither Agree nor Disagree	159	41.19
Disagree	26	6.74
Strongly Disagree	9	2.33
Missing	7	1.81



- The Library Learning Resource Unit (LLRU) has the resources to help me succeed in this program.

Response	Frequency	Percent
Strongly Agree	105	27.20
Agree	101	26.17
Neither Agree nor Disagree	140	36.27
Disagree	20	5.18
Strongly Disagree	13	3.37
Missing	7	1.81

Although the negative responses are less than 9%, the positive responses are only a little over 50 %, with the remainder (over one-third) being non-committal. This is not necessarily a knock against our LLRU. Most of our classes have a lab component where the students immediately apply what was covered during lecture. Without a need to do further research and write term papers and reports our students may not feel that they need the LLRU's resources as much as students in other disciplines. Additionally, many of our students remain in and use the open labs in the MBA building and don't feel the need to travel to the LLRU.

5a-iii) Facilities, Equipment, & Technology

The Math/Business/Allied Health (MBA) building which houses the CIS Department along with the accompanying hardware and software are two years old. The Microsoft operating system and application software used by the students are the most recent versions available. For those reasons the positive (Strongly Agree or Agree) response rates on the three questions in this section are high, and range from 88.08% to 94.04%.

- The buildings and classrooms used by this program are satisfactory.

Response	Frequency	Percent
Strongly Agree	245	63.47
Agree	118	30.57
Neither Agree nor Disagree	13	3.37
Disagree	3	0.78
Strongly Disagree	5	1.30
Missing	2	0.52

- I am satisfied with the equipment (projectors, machinery, models, etc.) used in this program.

Response	Frequency	Percent
Strongly Agree	235	60.88
Agree	110	28.50
Neither Agree nor Disagree	22	5.70
Disagree	7	1.81
Strongly Disagree	5	1.30
Missing	7	1.81

- I am satisfied with the computers and software used in this program.

Response	Frequency	Percent
Strongly Agree	227	58.81
Agree	113	29.27
Neither Agree nor Disagree	19	4.92
Disagree	9	2.33
Strongly Disagree	8	2.07
Missing	10	2.59

5a-iv) Program Objectives

- I am aware of the course outcomes – what I should be able to learn and what skills I should possess after completing courses in the program.

Response	Frequency	Percent
Strongly Agree	233	60.36
Agree	124	32.12
Neither Agree nor Disagree	23	5.96
Disagree	1	0.26
Strongly Disagree	2	0.52
Missing	3	0.78

The Business Division administrative and clerical staff reviews every instructor's syllabi to insure that they include, among other things, the course's student learning outcomes, course objectives, and teacher's grading policies. Outlining these areas and covering them with the students on the first day of class resulted in a 94.48% positive response rate to this question.

5b) Program implication of the survey results

Our students appear to: a) feel that they have the support of their instructors, b) enjoy the breadth of courses we offer, and the days/times that we offer them, c) are satisfied with the building their classes are housed in, and the hardware/software used to teach those classes, and d) understand exactly what their classes are designed to do, and what skills/concepts they should learn.

Out of all of the responses (other than "missing") to all of the questions in this section only 4.25% of the students responded either Disagree or Strongly Disagree. We feel that these numbers are good, but do not know how they relate to other departments or divisions within the College, or other colleges as we do not have access to that data.

5c) Results of other relevant surveys

None

5d) Related recommendations

1. Start a computer club. Possibly in conjunction with the Business Department in order to have joint projects.
2. Add new, or reword some of the existing survey questions that will allow students to identify those areas that they feel they are weak in when they first enter into a CIS 13 class.
3. Have the Business Division Office make available to all instructors a list of classes that are under enrolled so that "overflow" students can add needed classes.

6. Facilities and Equipment

a) Adequacy and currency of the facilities and equipment used by the program/department
b) Immediate (1-2 years) needs related to facilities and equipment
c) Long-range (2-4 years) needs related to facilities and equipment
d) List related recommendations

6a) Adequacy and currency of the facilities, equipment, and technology used by the program/department

Facilities

The Business Division offers most of its classes in eleven lecture rooms and seven computer labs located in the Math/Business/Allied Health (MBA) building. The building itself is less than three years old, and along with the two computer labs located in the newly renovated ITEC building are more than adequate. The same cannot be said for the two remaining lecture classrooms in the Administration Building and the one lecture classroom in the Communications building that we use. Both of these buildings are showing their age.

Equipment/Technology

Information technology is among the most rapidly changing areas in all of education. With the agreement of our advisory committee and knowledge of industry demands, our department has adopted a three year time frame within which our hardware/software needs to be updated. The classrooms in the MBA, Communications and ITEC buildings use computers that are already three-years old. The Administration Building classrooms, however, use computers that are seven to eight years old. These older computers are well beyond the three year cycle within which the CIS department tries to upgrade. Each classroom is able to accommodate forty-four students.

There is a media console (instructor console) in each classroom (both lecture and computer labs) that allows the instructor to display to a wall mounted projection screen through a ceiling mounted projector. The equipment in the media console consists of a computer, CD/DVD player, document camera, wall mounted speakers, and can also accommodate an instructor's laptop computer. Each of the devices in the media console may be used to project to the class.

In MBA 306 there is a color printer, and MBA 308 has a large flatbed scanner, for use by CIS, as needed.

ITEC -19 and 21 are computer labs for use by our Cisco Academy program. ITEC-19 (Curriculum lab) is setup similar to the MBA computer labs and is able to accommodate any existing CIS class. ITEC-21 is a 'specialized' computer lab with equipment specifically for use in the Cisco Academy (rack-mounted routers, switches, etc.); including additional equipment used specifically in the Cisco courses. We also employ Netlab in ITEC-21, which allows for off-campus student

access to rack-mounted routers, switches and virtual servers for our Cisco Academy program.

6b) Immediate (1-2 years) needs related to facilities, equipment, and technology

Our advisory committee agrees that since our area is industry driven, our department needs to have our equipment and technologies current in order to attract students, and give them the best chance at becoming employable in the IT field.

The need for a three year replacement cycle for hardware has been presented to both the College Technology Committee and the Academic Technology Committee. Although everyone seems to agree, the college has yet to adopt a concrete replacement/upgrade schedule.

1. Have twenty-two tablet computers available in lectures to encourage group discussions on certain topics
2. Budgeting restraints and licensing rules permitting, each CIS lecture/lab should have the exact same software in case of emergency situations that require a room change. An example would be the CIS 136 (Mobile Apps) class. The required software for this class is currently only available in one room.
3. The ability to plug in a tablet with cables that go to HDMI via micro USB.
4. Upgrade or re-configure our Utolegy-Control projector system to be hardware controlled as well as software controlled.

6c) Long-range (2-4 years) needs in these areas

The computers in our current labs will need to be replaced within this time frame.

Many new industry specific programs are using MACs (Macintosh) instead of PCs. The CIS department needs to begin to offer classes using a MAC platform.

Place a movable partition that can “split” MBA 107 into two rooms if necessary.

6d) Related recommendations

Our needs are mainly industry driven. In order for our students to be employable our advisory committee along with industry needs demand that we use current hardware technologies. Our department has mirrored those needs in our PLOs and SLOs. In order to be a viable educational option for CIS students, El Camino College must offer instruction with current hardware capable of supporting newer technologies.

1. Adhere to the three year cycle of upgrading, and adding to when necessary the resources within all computer labs.
2. Setup and install a MAC lab.
3. Place a movable partition that can “split” MBA 107 into two rooms if necessary.

7. **Technology and Software**
   a) Adequacy and currency of the technology and software used by the program/department
   b) Immediate (1-2 years) and long-term (2-4+ years) needs related to technology and software
   c) List related recommendations

7a) Adequacy and currency of the technology and software used by the program/ department

The classrooms in the MBA, Communications and ITEC buildings run Windows 8.1, Microsoft Office 2013 and Microsoft Visual Studio 2013. The Administration Building classrooms, however, use computers that are seven to eight years old and are still utilizing older software versions (Windows 7 and Microsoft Office 2010). As mentioned in section 6a, these older computers are well beyond the three year cycle within which the CIS department tries to upgrade.

Additionally, we are also using the following software programs in our lab rooms; 1) Netop Vision to monitor student activities on the computers, and 2) Deep Freeze to return the computers to a "known" state on reboot so that students cannot install unauthorized software.

7b) Immediate (1-2 years) and long-term (2-4+ years) needs related to technology and software

Within the next 3-4 semesters, all classes will need to have Windows 10 and Office 16 installed. This is a major software change that will be required in order for our classes to stay current and our students to remain marketable.

The department has decided, with the input of the advisory committee to begin to offer programs that are industry specific. The specific industries that will be offered initially will be in health care, cybersecurity, ad database management areas. Software that is dedicated to these areas will be needed in order to offer new classes that will be developed.

The department is hopeful to begin Health Care Technology program within two years. This means that that curriculum would be submitted in 2015, and would require the appropriate software.

Newer versions of help desk software will be needed in order to teach CIS 11.

7c) Related recommendations

In section 6 (Facilities and Equipment) we made our case for the necessity of having current hardware. The same arguments (industry demands, advice of our advisory committee, and in support of our SLOs and PLOs) obviously apply to software as well. Not only will we need to upgrade our current software, we are also developing courses and certificates in new areas that exhibit increasing demand. In order for our students

to receive the training necessary to become employable in these areas we will need the required software.

1. Upgrade to Windows 10 and Office 16. This is a major software change that will be required in order for our classes to stay current and our students to remain marketable.
2. Purchase a newer version of help desk software in order to teach CIS 11.
3. Purchase software needed for new classes and certificates currently in the curriculum development process.

8. **Staffing**
   a) Current staffing
   b) Program/department's immediate (1-2 years) and long-range 2-4+ years) staffing needs
   c) Related recommendations

8a) Current staffing

	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014
FTEF (full-time equivalent faculty)	9.63	10.53	10.45	9.67	8.60	9.49	10.53	9.32
Number of full-time FTEF	6.73	7.00	6.73	8.00	6.73	8.00	7.00	5.00
Number of adjunct FTEF	2.90	3.53	3.73	1.67	1.87	1.49	3.53	4.32
FT/PT load ratio	**70/30**	**66/34**	**64/36**	**83/17**	**78/22**	**84/16**	**66/34**	**54/46**

Source: Business Division office

During the last semester (spring 2015) the CIS Department employed four full-time, two early retirement/reduced load, and four part-time instructors.

Of the two early retirement/reduced load instructors, one just retired at the end of the spring 2015 semester. The other early retirement/reduced load instructor is within two years of retirement. Of the remaining four full-time faculty:

a) One is within 4 – 5 years of planned retirement.
b) One of them is still on probationary status.

Administration consists of the division's dean, and the clerical staff consists of one "open lab" supervisor, three full-time and one part-time employee that support the division.

Due to the unique skill sets required, our department faces obstacles when attempting to hire new faculty. It is more efficient to hire someone who already has the necessary skills and related experience then it is to try and retrain existing faculty. Unfortunately most qualified IT personnel gravitate toward jobs in industry because they feel that they can command a higher salary then they can in education. This is especially true for those individuals who learn and can implement newer technologies in businesses where the demand for those individuals far outpaces supply. Additionally, as in all areas, just because someone is competent in a particular subject matter does not mean that they can effectively teach the subject matter to others.

8b) Program/department immediate and long-range staffing needs

We have had three full-time departures within the last twelve months. We have replaced one of them, and that instructor is still in a probationary period. Of the remaining four full-time instructors, one of them are already on reduced load/early retirement. For these reasons, the department needs new faculty in order to stay

abreast of the many different areas within the CIS field, and help with curriculum, SLOs and program reviews in addition to their teaching loads.

8c) Related recommendations

1) Hire two new qualified full-time faculty members, where at least one has knowledge and experience in one of the new curriculum areas being developed.
2) Provide lab aides and tutors (student and employee) for both open lab and scheduled lab classes.
3) Continue recruitment of part-time faculty who are currently working in the industry as a strategy to keep the department vital in emerging technologies.

9. **Future Direction and Vision**
   a) Changes within the academic field/industry that will impact our program in the next four years
   b) Direction and vision of the program and our plan to achieve it
   c) How does the program fulfills the college's mission and aligns with the strategic initiatives

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9a) Changes within the academic field/industry that will impact our program in the next four years

1) Changes within the academic field or industry

Academic Field

a. Blended learning. Recently, the US National Center for Education Statistics reported that one in ten students was enrolled exclusively in online courses (http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=20140230). With this steady growth in online and face-to-face methods, "blended learning is on the rise at universities and colleges. The affordances blended learning offers are now well understood, and its flexibility, ease of access, and the integration of sophisticated multimedia and technologies are high among the list of appeals" (Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). *NMC Horizon Report: 2015 Higher Education Edition*. Austin, Texas: The New Media Consortium)

b. Redesigning learning spaces. A student-centered approach to education has taken root, prompting many higher education professionals to rethink how learning spaces should be configured (http://www.theglobeandmail.com/ news /national /education/what-universities-are-doing-to-create-a-more-exciting-learning-experience /article21177092).

   As higher education continues to move away from traditional lecture-based programming and to more hands-on scenarios, university classrooms will start to resemble real-world work and social environments (Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). *NMC Horizon Report: 2015 Higher Education Edition*. Austin, Texas: The New Media Consortium)

c. Bring your own device. The integration of personal smartphones, tablets, and PCs into the workflow supports an on-the-go mentality, changing the nature of work and learning activities so that they can happen anywhere, at any time. A recent study by Gartner predicted that by 2017, half of the world's employers will expect their employees to supply their own device for work (http://www.gartner.com/newsroom/id/2466615).

   Our mobile apps programming class, for example, will need to show how this technology will be implemented and displayed on different devices and different platforms.

   There are some concerns, however, regarding a digital divide — some critics point out that "bring your own device" could alienate students who cannot afford the latest technologies

Additionally there will be the additional strain of security concerns, and guaranteeing that sufficient infrastructure exists to support devices of all kinds.

Flipped classroom. "The flipped classroom refers to a model of learning that rearranges how time is spent both in and out of class to shift the ownership of learning from the educators to the students. In the flipped classroom model, valuable class time is devoted to higher cognitive, more active, project-based learning where students work together to solve local or global challenges — or other real-world applications — to gain a deeper understanding of the subject. Rather than the instructor using class time to dispense information, that work is done by each student after class, and could take the form of watching video lectures, listening to podcasts, perusing enhanced e-book content, or collaborating with peers in online communities" (http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom).

Industry

Listed below are some of the industry "changes" that could affect our program in the future. We use the term "changes" loosely, because they are not recent or overnight changes, but rather a noticeable increase in the use of newer pre-existing technologies.

a. Cloud computing and cloudware are dramatically changing how companies pay for their computing power and software.
b. Software development in the form of Web apps means that software will now be written for Web browsers instead of for particular operating systems.
c. Mobile computing will give people what they want; the ability to use software anywhere they want, on any device that they want.
d. The increased use of touch and gesture input is signaling the eventual end of the mouse.
e. The continued rise of open source software allows volunteer users, and not for profit companies to view the program code and modify it to suit their needs.
f. The use of software to analyze "big data" (data sets so large and complex that they cannot be effectively analyzed by traditional means) that use correlations to spot business trends.
g. Social media technologies continue to radically change the way that businesses interact with their customers.

9b) Direction and vision of the program and our plan to achieve it

The CIS program needs a few things to remain successful.

1) New programs – The department has a relatively new area in Web programming. The program is recently getting finalized and has begun to take hold. This program had been in its beginning phase for quite some time and only recently has been offered in its entirety. It still needs to be publicized and marketed.

2) A new direction the department needs is one in the area of Forensics and Security. Forensics is a new area of study and several colleges are offering degrees in Computer Forensics and Security. El Camino presently only has one class in security and nothing on Forensics.

3) A second new direction the department would like to pursue is in the area of Health Care Technology. Our Advisory Board stated that employment data shows there is a lot of new employment in this area, especially in the medical billing field. The idea was proposed to develop a "Health Information Worker" certificate, similar to the Business Information Worker Certificate.

4) El Camino's curriculum process needs to be modified in order to get courses available to students quicker. This is a recognized necessity, and seems to happen at other local colleges. Unlike many other departments the technology and required skills in our discipline change ***rapidly***. We hope, at the very least, that the curriculum committees take this into consideration.

5) Lastly, many new industry specific programs are using Apple Macintoshes' (MAC) instead of PCs. The CIS department needs to begin to offer classes using a MAC platform.

9c) Related Recommendations

In order to accomplish the visions of the department, the CIS department will need:

1) Training for existing faculty
2) The hiring of new faculty
3) Upgrading of present equipment
4) The purchasing of tablets and Macs
5) To move into emerging occupations – like forensics
6) To catch-up in areas like social media and Content Management Systems (WordPress for example) that are being offered at some other schools
7) To strengthen our current programs to make them more robust

10. Prioritized Recommendations

a. Prioritized list of recommendations and needs for our program/department, including *cost estimates* for salaries, expenditures and/or purchasing needs.

10a) Prioritized list of recommendations and needs for our program/department, including *cost estimates* for salaries, expenditures and/or purchasing needs

Necessary to maintain our department

1. Hire two new faculty members, one with a concentration in one of the new areas being developed.
   - Cost implications: Salary for each could be anywhere from $59,426 (step 4, class II master's degree) to $93,771 (step 4, class V doctorate) per employee per year with benefits, $190,000
2. Adhere to the three year cycle of upgrading the resources within all computer labs
   - Cost implications: $850,000
3. Provide faculty Training in Windows 10, Office 16 and other new technologies that will form the basis of future concepts that will be taught in our constantly changing field
   - Cost implications: $10,000 per year
4. Obtain Lab Aides and Tutors (student and employee) for open lab and lab classes
   - Cost implications: $82,000 per year
5. Continue the recruitment of knowledgeable information technology employees from local companies and recent college graduates as part-time instructors.
   - Cost implications: $0

Necessary to grow our department

1. Develop curriculum in Forensics, Health Care Technology and other emerging areas
   - Cost implications: $0
2. Upgrade/purchase software for existing/new classes as needed
   - Cost implications: $30,000
3. Purchase and install a MAC lab
   - Cost implications: $135,000
4. Hire personnel to publicize all of our CIS programs to local industry and high schools
   - Cost implications: $28,000 per year

11. Career and Technical Education (CTE)

i) How strong is the occupational demand for the program? As you analyze demand over the past 5 years and projected demand for next 5 years, address state and local needs for the program.
j) How does the program address needs that are not met by similar programs in the region?
k) What are the success, completion, and employment rates for the students? Discuss any factors that may impact completion, success, and employment rates. If applicable, what is the program doing to improve these rates?
l) If there is a licensure exam for students to work in their field of study, please list the exam and the pass rate. If there are multiple licensure exams in the program, include them all. Discuss any factors that may impact licensure exam pass rates. If applicable, what is the program doing to improve these rates?
m) Is the advisory committee satisfied with the level of preparation of program graduates? How has advisory committee input been used in the past two years to ensure employer needs are met by the program? Describe any advisory committee recommendations that the program is either unable to implement or is in the process of implementing.

Caveat:

Observations and statements made within this section have been based upon data retrieved from several federal, state and private resources.

Although every effort has been made to compare "apples to apples", some sources define occupational titles using TOP (taxonomy of programs) codes whereas others use CIP (classification of instructional programs), SOC (standard occupational classification) or NAIC (North American industry classification) codes.

Data taken from any of the sources that we have used all lead to the **same** conclusions stated herein. However, not every source provided numbers that combine the exact same occupational titles. Additionally, when comparisons are attempted, there is no exact correlation between all occupational codes. Because of this, the reader should be aware that an exact comparison of numbers or percentages is impossible due to the differences in the definitions used, and the collection methods employed by the different reporting agencies

a) How strong is the occupational demand for the program? As you analyze demand over the past 5 years and projected demand for next 5 years, address state and local needs for the program.

CTE 4 YEAR PROGRAM REVIEW:
Computer Information Systems

Occupations shown in question 12a include:

- Computer and Information Research Scientists (15-1111)
- Computer Systems Analysts (15-1121)
- Information Security Analysts (15-1122)
- Software Developers, Applications (15-1132)
- Software Developers, Systems Software (15-1133)
- Web Developers (15-1134)
- Computer Network Architects (15-1143)

As the tables below indicate, occupations in Computer Information Systems demonstrate a solid supply/demand ratio as current job postings exceed related completions. Hence, jobs in this occupation displayed solid growth over the past five years in LA County and the local area. Demand over the next five years will be relatively the same in LA County (+7%) and the local area (+5%) with a slight decline at the national and state levels.

Demand over the past 5 years (2009-2014):

Region	2009 Jobs	2014 Jobs	Change	% Change	Median Hourly Earnings
Los Angeles County	53,281	56,873	3,592	7%	$45.18
State	264,692	315,898	51,206	19%	$48.72
Nation	1,784,924	2,041,397	256,473	14%	$42.44
7.5 mile zip radius	9,689	10,329	640	7%	$46.30

Occupation Breakdown - % Change (2009 vs. 2014):

Occupation	Description	Los Angeles County	State	Nation	7.5 mile zip radius
15-1134	Web Developers	20%	30%	23%	20%
15-1122	Information Security Analysts	10%	17%	18%	12%
15-1121	Computer Systems Analysts	8%	16%	15%	10%
15-1132	Software Developers, Applications	5%	24%	16%	4%
15-1133	Software Developers, Systems Software	4%	18%	12%	4%
15-1111	Computer and Information Research Scientists	1%	20%	12%	(1%)
15-1143	Computer Network Architects	0%	3%	4%	3%
	Total	7%	19%	14%	7%

Demand for next 5 years (2014-2019):

Region	2014 Jobs	2019 Jobs	Change	% Change	Median Hourly Earnings
Los Angeles County	56,873	60,779	3,906	7%	$45.18
State	315,898	351,172	35,274	11%	$48.72
Nation	2,041,397	2,279,368	237,971	12%	$42.44
7.5 mile zip radius	10,329	10,891	562	5%	$46.30

Occupation Breakdown - % Change (2014 vs. 2019):

Occupation	Description	Los Angeles County	State	Nation	7.5 mile zip radius
15-1122	Information Security Analysts	13%	18%	17%	12%
15-1134	Web Developers	9%	12%	12%	7%
15-1121	Computer Systems Analysts	9%	12%	12%	7%
15-1132	Software Developers, Applications	7%	13%	12%	6%
15-1133	Software Developers, Systems Software	4%	9%	11%	4%
15-1111	Computer and Information Research Scientists	4%	7%	9%	3%
15-1143	Computer Network Architects	3%	7%	7%	2%
	Total	7%	11%	12%	5%

Sources for question 12a: Compiled by Institutional Research from EMSI (Economic Modeling); Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2014-15 Edition. Current job postings in Los Angeles County from indeed.com. Annual Openings Estimate and Related Completions in Los Angeles County. Completions are from the California Colleges Chancellor's website.*

b) How does the program address needs that are not met by similar programs in the region?

El Camino College is located within a major metropolitan area where IT skills are in demand. As expected, every comparable institution in our immediate area also offer variations of the same programs/courses. Each of the community colleges listed below draws its IT students based mainly on geographic distance from the students home or work location.

The table below (source; http://nces.ed.gov/collegenavigator/) lists all of the community colleges within a fifteen mile radius of El Camino College, whether they offer IT degrees and/or certificates, and the number of degrees or certificates conferred within the most recent year.

	Miles From El Camino College	Offer < 1 yr. certificate		Offer 1, but <2 yr. certificate		Offer Associate's degree		Offer 2, but < 4 yr. certificate	
El Camino College	0.0	Yes	0	Yes	2	Yes	13	Yes	0
Los Angeles Southwest College	5.1	Yes	0	Yes	0	Yes	3	No	
El Camino College - Compton Center	7.3	Yes	0	Yes	0	Yes	0	No	
Los Angeles Harbor College	7.9	Yes	0	Yes	0	Yes	0	No	
West Los Angeles College	8.5	Yes	29 *	Yes	29 *	Yes	10	No	
Santa Monica College	11.7	Yes	0	Yes	5	Yes	11	No	
Long Beach City College	13.7	Yes	5	Yes	3	Yes	12	Yes	0
Los Angeles City College	14.3	Yes	0	Yes	0	Yes	1	Yes	0

* Note: The "Offer < 1 yr. certificate" and "Offer 1, but < 2yr. certificate" numbers for West Los Angeles College represent online programs

Of the eight community colleges listed above, all offer what are classified as less than one year certificates, one year but less than two year certificates, and associate degrees. El Camino is one of only three that offer two year but less than four year certificates. El Camino also had the highest number of associate degrees conferred for its CIS majors.

It should be noted that the CIS Department is currently in the process of updating the content and requirements for the Computer Information Systems Associate's degree and corresponding certificates based upon interaction with the state's Community Colleges Chancellor's Office, and input from our Advisory Committee.

c) What are the success, completion, and employment rates for the students? Discuss any factors that may impact completion, success, and employment rates. If applicable, what is the program doing to improve these rates?

	Success
2010 Fall	63.2%
2011 Spring	63.7%
2011 Fall	63.8%
2012 Spring	65.4%
2012 Fall	70.7%
2013 Spring	70.0%
2013 Fall	66.1%
2014 Spring	68.0%

	Retention
2010 Fall	78.8%
2011 Spring	77.8%
2011 Fall	80.7%
2012 Spring	78.2%
2012 Fall	83.3%
2013 Spring	81.1%
2013 Fall	81.1%
2014 Spring	80.8%

Success and Completion

The data for the last eight available semesters show:

a) A fairly consistent success rate averaging 66.4% (high = 70.7% low = 63.2%)
b) An equally consistent retention rate averaging 80.3% (high = 83.3% low = 77.8%)

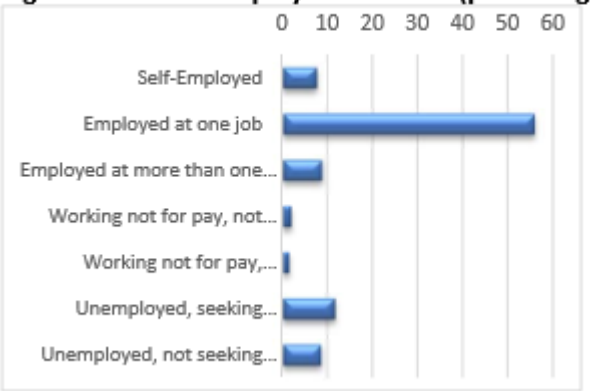
Both of these average rates are slightly higher (63.7% and 79.5% respectively) than when the department submitted the 2013 CTE Program Review two years ago.

Employment

Note: The paragraphs below refer to numbers that represent all CTE students at El Camino College. As of the submittal date of this report, individual program level data was not available.

According to El Camino College's Technical Education (CTE) Employment Outcomes Survey 2014, 72.42% of all respondents are employed for pay (see Figure 2 below).

Figure 2. Current Employment Status (percentages)



When asked if they were currently employed, how closely related their job is/was to their field of study at El Camino College. 46.43% indicated they are working in the same field as their studies and training, followed by 21.98% indicating they work in a field that is "close" to their studies and training, and 31.59% indicated their job is not related to their studies. (Source: Career & Technical Education Employment Outcomes Survey 2014; El Camino College).

Of those respondents who engaged in a job search after finishing their studies, 69.57% reported finding a job and 30.43% were still looking (the remaining respondents were not looking or were already employed). Of those with a successful job search, 76.51% found a job within six months with 57.72% within three months. (Source: Career & Technical Education Employment Outcomes Survey 2014; El Camino College).

In conclusion the Employment Outcomes Survey for 2014 stated that "completing CTE studies and training – whether or not a credential is earned, whether or not a student transfers – is related to positive employment outcomes. The preponderance

of respondents are employed, are working in the same field as their studies or training, and are working full time. Respondents overall posted a 25.57% increase in their hourly wage after completing their studies a El Camino College." (Source: Career & Technical Education Employment Outcomes Survey 2014; El Camino College).

d) If there is a licensure exam for students to work in their field of study, please list the exam and the pass rate. If there are multiple licensure exams in the program, include them all. Discuss any factors that may impact licensure exam pass rates. If applicable, what is the program doing to improve these rates?

There are no federal or state licensure exams required of our students to work in the information technology field.

There are, however, industry certification exams. Students who want to become "CISCO certified" can arrange to take CISCO's CCNA exam at an official testing center. We do not have access to the pass rates because the students can take the tests at any of the available testing centers. The testing centers are not affiliated with El Camino College, and do not make this data available.

e) Is the advisory committee satisfied with the level of preparation of program graduates? How has advisory committee input been used in the past two years to ensure employer needs are met by the program? Describe any advisory committee recommendations that the program is either unable to implement or is in the process of implementing.

California Education Code 78016 requires that the review process for CTE programs includes the review and comments of a program's advisory committee.

1) Advisory committee membership list and credentials

- Kevin Laird, Senior Data and Integration Manager, Toyota Financial Services
- Debbie Goldwater, Director IT Architecture and Security, UCLA
- Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
- Doug Thompson, Sr. Developer, Houlihan Lokey Global
- Nathan Mintz, Systems Engineer, Boeing
- Dean Westcott, Director Business Systems Integration, Northrop Grumman
- Cameron Carlton, Account Executive, Robert Half Technology

2) Meeting minutes or other documentation to demonstrate that the CTE program review process has met the above Education Code requirement.

Department of Computer Information Systems (CIS)

Advisory Board Meeting

Date: April 26, 2013 9:00 AM

Location: MBA 417A

Attendees: Dr. Virginia Rapp, Dr. Pat Vacca, Dick Barton, Randy Harris, Dave Miller, Dave Murphy, Jay Siddiqui, Gabriella Fernandez, Monica Chaban, Kevin Laird, Debbie Goldwater, Elliott Stern, Doug Thompson, Nathan Mintz
Absent: Jacquie Thompson

The meeting began at 9:00 a.m. with Dr. Virginia Rapp welcoming everyone and providing background about the CIS department and the goal of the CIS advisory board meeting. Introductions were conducted.

Randy Harris then introduced the CIS program, focusing on the topic - *How computers are used in business and industry*. The Program Review process and Plan Builder were described. Randy indicated that the goal of the CIS Department is to try to remain current and develop relevant courses. The limitation CIS has is that faculty are not in the industry on a day-to-day basis, and therefore input from the advisory board is very important. Also, students should be able to complete the program in 2 years. There are three groups that CIS services: students seeking an AA degree for transfer to a 4 year; students seeking a certificate for career change or advancement, and students coming back to learn a specific skill.

The remainder of the meeting was devoted to discussion and recommendations. One main topic centered on what employers look for in job applicants with AA degrees. The board's opinion was mixed – some felt that in the field of IT, a 4 year degree was important, while others felt experience was what mattered. All agreed that a 2 year AA degree in CIS would not get a person hired today in a large company, but that small to medium sized companies, or companies that work was outsourced to, would be more likely to hire an AA degree applicant.

For skill development, some companies would enroll their employees in a short-term course at a community college. Other companies have quick-start, 1 day programs in-house, but that these courses do not cover the full breadth of the material.

Everyone agreed that IT has changed - fifteen years ago an AA degree got a person a job, but not today. The focus today is on cyber security, networking, computer hardware, and web development. A CIS AA degree would need to map into a 4 year MIS degree. As such, the AA degree should offer the respective transferrable courses to clearly guide the CIS major seeking transfer.
The new Help Desk certificate that is being proposed was discussed. The board felt that typing skills should be a pre-requisite. The board members use a wide variety of help desk

software (Prism, Apex, Remedy, Service Now), but felt that a student trained in one help desk package could easily learn another, as the concepts are the same. CIS teaches Help Star. One other requirement mentioned was that help desk personnel need to be well rounded, in that they know enough about computers in order to know how to properly direct a call/ticket. Other technology that the board felt should be considered would be advanced courses in Excel, Visio, and a CMS, as all are heavily used in industry. The board thought a basic class in networking should be required of all CIS students.

Entry level positions were discussed at length, along with the skills and course content needed to get such positions. At minimum, the board felt entry level positions required basics skills in using the various office applications, with an emphasis on file management and word processing. They also mentioned that rarely do new hires understand how to use a spreadsheet nor an email/calendar application, such as Outlook. They suggested having one course that encompassed the full Office suite with file management. Faculty indicated, that except for Outlook, several courses existed that, when combined, covered those concepts, but agreed that consolidating the material into one course might be a better approach to assist students in obtaining entry level positions.

The concept of "tracks" was discussed and highly recommended. Such tracks might include:

- Help Desk
- Device/Desktop support, including setup and maintenance of not only PC's, but phones, tablets, virtualization, cloud computing, application support, PC management, security, virus protection, backups, maintenance, basic networking, etc.
- Web development/management including HTML, CSS, Javascript, PHP, MySQL or Access databases, a CMS, such as WordPress, SEO, and social marketing
- Programming, including system analysis and design, languages, databases, and most often mentioned, logic

The meeting wrapped up with the discussion of where graduates go after they get their 2 year/4 year degrees. There is a group that has conducted a survey. The response rate was 25%. Mail and phone contact received the best feedback. The survey is being planned again. The board was thanked for their time and contribution. The meeting adjourned at 10:20 a.m.

Kevin Laird, Sr Data and Integration Manager, Toyota Financial Services
Debbie Goldwater, Director IT Architecture and Security, UCLA
Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
Doug Thompson, Sr. Developer, Houlihan Lokey Global
Nathan Mintz , Systems Engineer, Boeing
Pat Vacca, CIS faculty
Dick Barton, CIS faculty
Randy Harris, CIS faculty
Jacquie Thompson, CIS faculty
Jay Siddiqui, CIS faculty
Dave Miller, CIS faculty
Dave Murphy,Business Division Lab Technician
Monica Chaban, CIS faculty

Department of Computer Information Systems (CIS)

Advisory Board Meeting

Date: April 11, 2014 9:00 AM

Location: Stadium Room

Attendees: Kevin Laird, Sr Data and Integration Manager, Toyota Financial Services
Debbie Goldwater, Director IT Architecture and Security, UCLA
Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
Doug Thompson, Sr. Developer, Houlihan Lokey Global
Nathan Mintz , Systems Engineer, Boeing
Pat Vacca, CIS faculty
Dick Barton, CIS faculty
Randy Harris, CIS faculty
Jacquie Thompson, CIS faculty
Jay Siddiqui, CIS faculty
Mohammad Khalilzadeh, CIS faculty (Compton)
Monica Chaban, CIS faculty

Absent: Dr. Virginia Rapp, Dean, Business Division

NOTE: Participants began to arrive before 9AM and were greeted by Dr. Virginia Rapp, who had to leave before the meeting began, due to a prior commitment.

The meeting began at 9:00 a.m. with Randy Harris welcoming and thanking everyone for their participation. Randy indicated the goal of CIS is to try to remain current and develop relevant courses, and therefore input from the advisory board is very important. Randy indicated that our goal this year was to focus on our certificates, and that we would begin the meeting with a summary of the many changes CIS has implemented based on the board's recommendations at last year's meeting:

- Dick Barton summarized the changes made to the CIS 13 course. It was modified to eliminate Word and PowerPoint, and to place more emphasis on spreadsheet and database skill development. This concentration could help to prepare students for entry-level jobs. Dick indicated that students seemed more prepared with keyboarding than in the past.
- Pat Vacca discussed the updating of the CIS 11 Help Desk course, and the development of the Computer User Support Specialist certificate, also an area where students could advance into entry-level jobs.
- Jay Siddiqui discussed the changes to the CIS 19 – Internet, Security and the Web course. It was revised to place more emphasis on security, cloud computing, and

Software as a Service (SaaS). It was felt that security is a hot option – and that there are probably more opportunities in that area for ex-military.

The remainder of the meeting was devoted to general discussion and review/recommendations of the CIS certificates.

One main topic centered on the need for basic networking setup skills. Networking fundamentals were talked about at length, and was proposed as a good foundation course for entry-level jobs, especially in the area of security and help desk management. It was discussed that IT security ties into networking fundamentals in many ways. Security is not a field a person would be likely to move straight into from El Camino College, but having basic skills in networking, coupled with an understanding of the role security plays, the student would be better positioned to obtain an entry level position in an IT support department. They might start out with an entry level job repairing computers, setting up networks, assigning user accounts/access, or managing a help desk. Then once their background is established, they would be more likely to advance into a higher-level position.

This then led to a discussion of the needs of smaller companies for Networking support. There are many small businesses, such as Law firms, Medical offices, and non-profits who do not have a large IT support staff, and may hire one to two people or outsource management of their computer system (equipment, networking, printers, databases and data backups, data recovery, etc.). The board felt there is a demand for this type of skill, and would be something that a 2 year student could easily move into. It was recommended that students get exposure to the real world, and that working in a field trip to a Computer Center or inviting in a guest speaker would be a good addition. The board recommended developing a certificate in *Small Business Technical Support.* With the addition of a new course in networking fundamentals, the department currently offers courses that would support the certificate (CIS 13, CIS 11, CIS 40, CIS 19, CIS 26, and CIS 28).

The discussion turned to a review of each Certificate of Achievement.
Computer User Support Specialist: The board agreed with the certificate and the proposed course's within it, noting the inclusion of a Networking fundamentals course, and a resolution to the excel courses (it was explained that the changes to CIS 13 impacted the existing excel and database courses, and that the courses were undergoing review for either revision or inactivation). It was suggested CIS consider adding a Written Business Communications course, as procedures and sign-offs are important in this area, but that the certificate is acceptable as written.

CISCO Networking Administration: The board agreed with the certificate and positively remarked that it was quite a rigorous and excellent program in that it ended in CISCO certification.

Business Programming: The board agreed with the certificate. It was suggested that CS 12 be removed as an optional course. The board was extremely pleased that the department was staying abreast of software development given rapidly changing technology, and including new courses in the curriculum. The new mobile apps course was a point of discussion and conversation turned to the complexities of testing and deploying mobile apps on multiple

platforms. Some students do not have their own smart device, or have an outdated device, while others have an Android, Apple, or Windows device. The board suggested that the department look into acquiring this hardware so that all students could be accommodated and have the opportunity to experience as many platforms as possible. It was suggested that Android and Apple devices be considered, as they have significant market share.

Database Management: This certificate is in the proposal stage. The board agreed with the certificate and discussed the courses that should be included. The board recommended that a Database Design course be included (CIS 29 is such a course), and that a more general course in SQL programming be substituted for the Oracle class. The rationale is that many companies use other databases such as DB2, and SQL server, and a more generic class would be more appropriate. The inclusion of a programming class where a database is used was recommended (CIS 16 or CIS 134). The inclusion of a Networking fundamentals class was also recommended. With these suggestions, (CIS 13, CIS 28, CIS 29, CIS 16 or CIS 134, SQL Programming, and Network Fundamentals) the board agreed with moving forward with the certificate.

Business Applications: The board recommended revising the proposed certificate, to consolidate the courses that are options. This will be scheduled for review at the next advisory board meeting.

The final topic that was discussed was resources. With so many different courses being offered, the need for diverse hardware as well as educators skilled in many areas was discussed. The department currently has an "open lab" room for students to use to complete their assignments, and each lab class has a lab assistant available. It was discussed that sometimes this is not enough – certain students need more assistance than others. In some classes we can have students helping students, especially where there are group projects assigned, but not in all classes. A variety of ideas were explored – from having lab assistants scheduled in the open lab in addition to their regular assignments, to implementing a tutoring program for the more advanced subjects. In addition to human resources, certain courses have specific hardware and software needs. While the basic lab rooms are well equipped with newer computers, and current system software, some classes need more. The CISCO courses are an excellent example of that, and other courses, such as the Mobile Apps course, Help Desk, and the Personal Computer Operations classes could benefit as well. If the department continues to stay abreast of technology, and get into newer areas, hardware and software requirements will continue to expand. Everyone felt that having more resources would definitely help to improve student success rates, and funding for such should be earnestly sought after.

The board was thanked for their time and contribution. The meeting adjourned at 11:00 a.m.

Department of Computer Information Systems (CIS)

Advisory Board Meeting

Date: April 10, 2015 9:00 AM

Location: MBA 304

Attendees: Kevin Laird, Sr. Data and Integration Manager, Toyota Financial Services
Debbie Goldwater, Director IT Architecture and Security, UCLA
Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
Dean Westcott, Director Business Systems Integration, Northrup Grumman
Cameron Carlton, Account Executive, Robert Half Technology
Dr. Virginia Rapp, Dean, Business Division
Pat Vacca, CIS faculty
Dick Barton, CIS faculty
Randy Harris, CIS faculty
Jay Siddiqui, CIS faculty
Andre Lee, CIS faculty
Mohammad Khalilzadeh, CIS faculty (Compton)
David Pahl, Office Administration faculty
Monica Chaban, CIS faculty

The meeting began at 9:00 a.m. with Dr. Virginia Rapp welcoming and thanking everyone for their participation. Dr. Rapp indicated the goal of CIS is to try to remain current and develop relevant courses, and therefore input from the advisory board is extremely important.

After a round of introductions, Randy Harris led a review on accomplishments that have been made based on the board's recommendations at last year's meeting. CIS faculty have completed development of the Business Programming Certificate as well as the Computer User Support Specialist Certificate. The remaining recommendations are still in development.

The board was surprised the process took so long, given the nature of rapidly changing technology. The steps in the curriculum process were presented. They indicated a quicker pace would be better to keep abreast of technology.

Proposed Database certificate
The components of the SQL Programming course were reviewed and agreed upon by all. The board debated the merits of having a networking fundamentals course as part of the certificate. Students do not need to learn about routers, switches, and OSI layers. Instead they need to have more experience with how data is used and managed by a company. Topics such as data warehousing, data analytics, data mining, data modeling, data backups, and data

reporting, especially with a popular tool such as Crystal Reports, were proposed as a better fit to rounding out the certificate. Adding these topics would result in a new course. The board recommended the certificate be named Database Design or Database Management.

Proposed Small Business Technical Support certificate
The board felt this certificate was an area where students could advance into entry-level jobs, and could be simple enough for the student to complete in one year. There are many small businesses in need of technical support to keep their offices operating smoothly (Law firms, Medical Offices, Veterinarians, etc.). The support small businesses need is in general PC maintenance, setting up small networks (LAN's), data backups, security, and additionally there is a telecommunications component. The proposed course requirements were reviewed, and CIS 40 - Personal Computer Operations was examined. This course currently focuses on software maintenance from a COMPTia/A+ certification perspective. The board didn't really think that certification was that beneficial and recommended revision of the course to cover the components listed above.

Proposed Business Information Worker certificate
At the 2014 Advisory Board meeting, the proposed *Business Applications* certificate was reviewed and the board recommended changes. During the past year, a new "Chancellors Level" certificate was developed that includes courses that meet the criteria specified by the board. The certificate, entitled *Business Information Worker*, was presented to the board along with a list of CIS courses that match to, and meet the criteria. It was also mentioned that one new course (CIS 2) matches the requirements of three of the listed courses, and that the Deputy Sector Navigator had been consulted. The ruling was that CIS 2 would be acceptable substitution. Given that, the Board was in favor of moving forward to offer this certificate, as there are many entry level office jobs available.

The following areas were discussed:

- **Resources –** Current hardware and software is critical to the program. It was recommended that MAC's be incorporated as many industries are shifting to MACS, and it is becoming a "hot" product. Also, as they reach the market and become embraced by the business world, the latest tablets, desktops, laptops, and relevant gadgets should be incorporated into respective courses. This would enrich student learning, as not all students are exposed to newer technology.
- **Forensics and Security** – Forensics is a new area of study and several colleges are offering degrees in Computer Forensics and Security. Dr. Rapp mentioned a collaboration effort that she is leading, between El Camino College, Pasadena College, and Glendale College. The mission is to develop a cybersecurity training program for educators. A "one-time" Perkins Enhancement Fund to develop projects with others schools is supporting this development. It is proposed to be a series of training sessions over a period of time that could eventually develop into a course offered by the colleges.
- **Small Business Accountant** – This certificate is being proposed by the Office Administration department. Discussion surrounded the inclusion of QuickBooks and it was agreed that the "Choose One" courses would be better candidates for removal before Quickbooks, knowing Quickbooks is a goldmine. The board approved moving forward with the certificate as currently designed.

- **Health Information/Medical Billing** – the discussion focused on the worthwhileness of moving into industry-specific education. The board especially liked that idea, because employment data shows there is a lot of hiring going on, especially in the medical billing field. For example – data shows that Molina Healthcare hires a lot of entry level help desk personnel. The idea was proposed to develop a "*Health Information Worker*" certificate, similar to the Business Information Worker Certificate. Understanding and knowing about HIPAA compliance was discussed at length and it was proposed that this topic might be a component of CIS11 - Help Desk. The student could brag that "*I learned the HIPAA protocols at El Camino College and I understand the regulations surrounding medical office technology – I passed the test*". It was highly recommended that collaboration with the Allied Health Division be pursued.

Marketing

The final topic was on increasing enrollment. How can 1,000 students be divided in so many ways? What is the best way to market a great CISCO program, or a new course, such a Mobile Apps? Several ideas were proposed:

- Hire a CTE specialist to push CTE programs at the local high schools
- Contact temp agencies to find out if they are looking for entry level personnel
- Attend job fairs
- Contact and work with the EDD and Veterans Administration
- Advertise on Craigs List
- Go Social – establish a social media presence (it was even suggested a student could develop this as an independent study)
- Get a student(s) majoring in marketing or design to design a campaign
- Advertise internally for employee training

The ideas incorporating student involvement are very do-able, with little effort and little cost. However many of the other ideas require more manpower, planning, and are dependent on funding. The faculty will prioritize the most achievable and formulate a plan of action.

The board was thanked for their time and contribution. The meeting adjourned at 11:00 a.m.