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El Camino Community College

PROGRAM REVIEW 2019

BUSINESS DIVISION

COMPUTER INFORMATION SYSTEMS

DEAN:
Dr. Virginia Rapp

CONTRIBUTOR(S):
Chaban, Monica
Harris, Randy
Lu, Khai
Perkins, Richard
Siddiqui, Dr. Jay

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SECTION 1
Overview of the Program

A) Provide a brief narrative description of the current program, including the program's mission statement and the students it serves. Also include in this section any program highlights and/or accomplishments, as well as the most critical needs of the program.

At the core of the Computer Information Systems (CIS) program is a business-related focus that requires our department to offer instruction in many technologies so that our students are able to decide which is the best to efficiently, and effectively solve various business problems.

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

With technology life cycles measured in months instead of years, the very nature of CIS is also always rapidly changing. Whereas we previously taught networking via on-site local area networks, we are moving into instruction of on-demand cloud computing platforms like Amazon Web Services.

Additionally, the ever-growing dependence on computer technology within companies of all sizes has raised the demand for skilled candidates, and has caused enrollments in our advanced CIS classes to expand accordingly.

For these reasons, one of our department's most critical needs is to continually add to, or update curriculum as rapidly as possible to include ever-changing, in-demand cutting-edge technology.

B) Describe the degrees and/or certificates offered by the program.

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, whereas a Certificate of Accomplishment is not. 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 six Certificates of Achievement, one Certificate of Accomplishment, and several others are in the curriculum approval process.

A.S. Degree

The program is intended for students interested in information systems and can lead to career opportunities as software specialists, web programmers, database developers, systems analysts, or network administrators. A variety of courses will enable students to learn project management, perform systems analysis and design, create business software including websites, desktop applications, mobile apps, manage business data using spreadsheets and databases, implement cybersecurity measures, handle help desk incident reports, and install and maintain small and large LANs (local area networks). Students will demonstrate their

proficiency through performance in laboratory exercises and objective examinations. Program assessment is measured by program completion and periodic program review.

El Camino College Major Requirements:

Required Core (9 units): Computer Information Systems 13, 119 and either CIS 26 or CIS 28;
Select one of the following groups of courses (9-11 units):

Help Desk: Business 27, 60A and 60B, Computer Information Systems 2, 11, 40
Networking: Computer Information Systems 40, 137, 140, 141, 142, 143
Programming: Computer Information Systems 16, 18, 80, 132, 134
Mobile and Web Programming: Computer Information Systems 84, 132, 133, 136
Total Units: 24-26

Certificates of Achievement

Business Programming:

The Business Programming Certificate prepares students with an understanding of the latest software technology, and its application in the business programming environment. The curriculum covers technical design, system development workflow, structured programming methodologies, programming languages, and website and mobile application development.

A minimum of 15 units must be completed at El Camino College.

Required Core (9 units): Computer Information Systems 13, 18, 132

One of the following tracks:

Enterprise: Computer Information Systems 16, 80, 134

Web: Computer Information Systems 84, 133, 136

Total Units: 22

Computer Systems Applications:

The Computer Systems Applications Certificate is designed to prepare students with the general knowledge to use word processing, spreadsheet, database and help desk software. Students will also gain an understanding as to how software is built.

A minimum of 15 units must be completed at El Camino College and a grade point average of "B" is necessary in the required 21-22 units.

Required Core (12 units): Computer Information Systems 13, 18, 26, 28;

Programming (3-4 units): Computer Information Systems 16, 133, 134, 136;

User Support (3 units): Computer Information Systems 11, 40

Total Units: 21-22

Database Management:

The Database Management Certificate is designed for student who wish to learn how to effectively design and develop relational databases, capture, store, retrieve and analyze data, and acquire programming skills in relational database management systems (RDMMS) and structured query language (SQL)

A minimum of 15 units must be completed at El Camino College and a grade point average of "B" is necessary in the required 23 units.

Required Core (23 units): Computer Information Systems 13, 18, 28, 29,80, 84, 119
Total Units: 23

Computer User Support Specialist

The Computer User Support Specialist Certificate is designed for students who wish to learn the essential skills in computer support. The Certificate focuses on developing both the technical and interpersonal skills needed to troubleshoot and support both hardware and software problems, including the desktop, web, and mobile platforms.

A minimum of 15 units must be completed at El Camino College and a grade point average of "B" is necessary in the required 19 units.

Required Core (19 units): Computer Information Systems 13, 28, 40, 11
Business (BUS) 28, 29, 60A
Total Units: 19

Cloud Computing and Programming with Amazon Web Services

The Cloud Computing and Programming with Amazon Web Services certificate (AWS) is designed for students who wish to learn AWS cloud solutions. The fundamentals of cloud computing, including big data, security, programming and networking in the cloud for new or existing systems, are covered using the AWS infrastructure and its services. This certificate prepares the student for AWS certification.

Required Core (16 units): Computer Information Systems 134, 150, 152, 154, 156

Business Information Worker

The Business Information Worker Certificate is designed to prepare students for entry-level office and administrative positions. Students will learn Microsoft Office software including Word, PowerPoint, Excel, Access and Outlook.

Required Core (19 units): Computer Information Systems 2, 13, 26
Business (BUS) 22, 28, 29, 60A

CISCO Networking and Administration

The CISCO Networking and administration Certificate is designed to prepare students with marketable technical skills through a comprehensive understanding of computer and end-device networking, design, and maintenance using CISCO products. This certificate prepares the student for CISCO Certification.

Required Core (21 units): Computer Information Systems 13, 40, 137, 140, 141, 142 and 143

Cybersecurity

The Cybersecurity Certificate is designed for students who wish to learn how to investigate, handle and prevent cyber-attacks. Students will develop the skills needed to protect data, computers, and networks from unauthorized access. This certificate prepares the student for CompTIA CySA+ certification.

Required Core (24 units): Computer Information Systems 13, 40, 119, 120, 121, 122, 137, Administration of Justice (AJ) 142

C) Explain how the program fulfills the college's mission and aligns with the strategic initiatives.

The mission of El Camino College is to make a positive difference in people's lives by providing comprehensive educational programs and services that promote student learning and success in collaboration with our diverse communities.

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

STRATEGIC INITIATIVES

1. **Student Learning:**
   We adhere to the timelines in assessing and revising (when needed) our SLOs, PLOs and ILOs. 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).

2. **Student Success and Support:**
   We articulate courses with local California State Universities, University of California campuses, 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).

   We provide open labs with tutors five days a week with hours throughout the day and evening where students can receive extra help (strategic initiative A; enhance teaching to support student learning using a variety of instructional methods and services).

3. **Collaboration:**
   We 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).

4. **Community Responsiveness:**
   We 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).

5. **Institutional Effectiveness:**
   Part of El Camino College's mission statement is that the college "makes a positive difference in people's lives" by "providing excellent comprehensive educational programs that promote student learning". The CIS department routinely analyzes new technologies and skills that are in demand, and adds to, or modifies existing curriculum in order to offer courses that provide those skills.

6. **Modernization:**
   Budget constraints permitting, we try to 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).

D) Discuss the status of recommendations from your previous program review.

1. **Recommendation:** Hire two new faculty members, one with a concentration in one of the new areas being developed
   Status: Completed
   Notes/Comments: The CIS Department has hired two new faculty members, each concentrating on a new technology area (Mr. Richard Perkins; Cybersecurity, and Mr. Khai Lu; Amazon Web Services) that has been added to our curriculum since the 2015 Program Review.

2. **Recommendation:** Adhere to the three-year cycle of upgrading the resources within all computer labs
   Status: Partially complete
   Notes/Comments: This is a huge financial commitment that the school would have to address every three years. Even though all of the computers in the department's labs are now out of warranty, the college had to reconsider its original plans to upgrade them due to budgetary constraints. The computers in lab rooms MBA 206, 306 and 308 were upgraded this past January from sources like strong work force funds. Additional lab rooms will be upgraded when, and if, additional funds become available.

3. **Recommendation:** 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
   Status: Completed
   Notes/Comments: Seminars, workshops and "brown bag" training have been made available on many topics such as Microsoft Office, Amazon Web Services, and cybersecurity.

4. **Recommendation:** Obtain Lab Aides and Tutors (student and employee) for open lab and lab classes
   Status: Completed
   Notes/Comments: In 2018 the Business Division hired a full-time open lab supervisor/tutor who provides help to our beginning through advanced CIS students.

5. **Recommendation:** Continue the recruitment of knowledgeable information technology employees from local companies and recent college graduates as part-time instructors.
   Status: Ongoing
   Notes/Comments: We are always looking for qualified adjunct instructors with relevant industry experience.

6. **Recommendation:** Develop curriculum in Forensics, Health Care Technology and other emerging areas

Status: Completed

Notes/Comments: The CIS Department has deferred new curriculum in Health Care Technology, but has developed new curriculum as follows:

- CIS 84; MySQL Database Programming
- CIS 119; Introduction to Computer Security
- CIS 120 Computer Forensics
- CIS 121 Cybersecurity Programming
- CIS 122; Ethical Hacking
- CIS 132; Web Development using HTML5, CSS3, and WordPress
- CIS 137 Computer Networking Fundamentals
- CIS 150; Cloud Computing with Amazon Web Services (AWS)
- CIS 152; Data Storage with Amazon Web Services (AWS)
- CIS 154; Compute Engines with Amazon Web Services (AWS)
- CIS 156: Security with Amazon Web Services (AWS)

7. **Recommendation:** Upgrade/purchase software for existing/new classes as needed

   Status: Ongoing

   Notes/Comments: Currently we have upgraded or obtained new software for existing, and newer classes like Cybersecurity and Amazon Web Services. As our curriculum changes frequently, this will be an ongoing effort.

8. **Recommendation:** Purchase and install a MAC lab

   Status: On hold

   Notes/Comments: Due to budgetary constraints this recommendation is on hold. Although it is doubtful that funds for a new MAC lab will be available before the next program review there is a possibility that we can make arrangements with ITEC to use their MAC lab.

9. **Recommendation:** Hire personnel to publicize all of our CIS programs to local industry and high schools

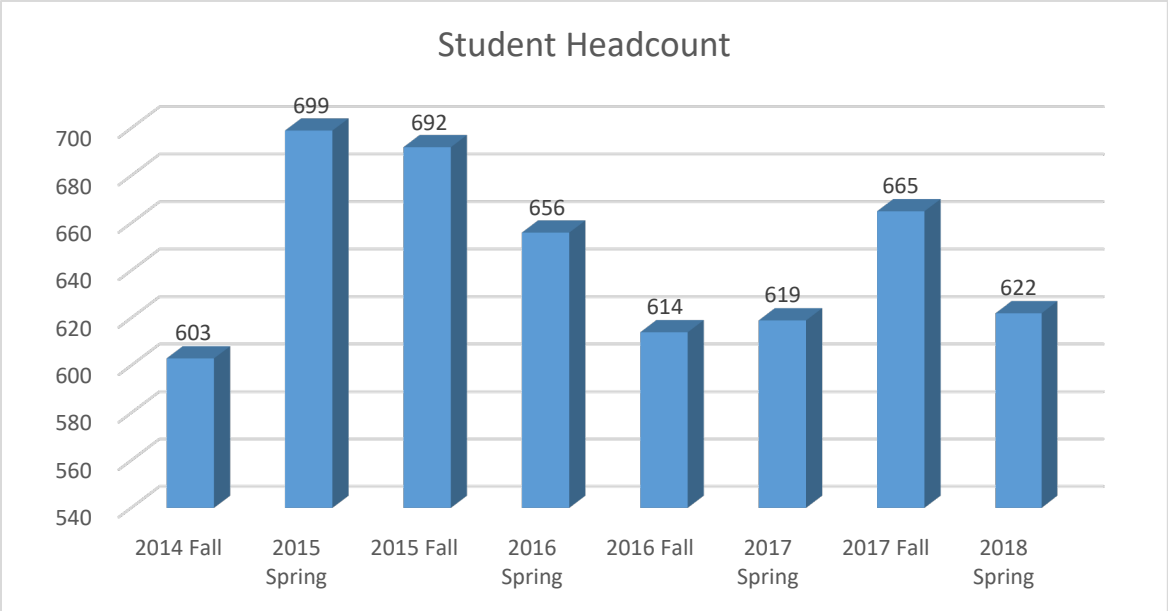
   Status: Active

   Notes/Comments: CIS has been awarded a CTEA grant to promote the department curriculum. To that end we have hired the services of two Media Development Companies to help develop our marketing campaigns. One company, Substance Media, has developed video content for each curriculum track in our discipline. These videos are to be used in our social media and outreach campaign, currently being scheduled with the ECC Publications department. The other company, APirateLife4Me has developed printed brochures, flyers and posters. The brochures detail our existing programs as well as the courses we currently offer. The posters and flyers have been used for College Night, CyberDay and Cloud Day events. The last effort, completed in August this year, was the development of 2 overarching videos, one promoting the Business Division and the other promoting CIS, and 2 shorter videos concentrating heavily on our two newest programs, AWS and Cybersecurity. These are to be used by the counselors and outreach personnel to further promote our programs. The feasibility of hiring outside personnel to market our programs has yet to be determined.

SECTION 2
Analysis of Research Data

A) Head count of students in the program

The chart below indicates the student headcount numbers from fall 2014 through spring 2018. The high enrollment in 2015 was attributed to the downtrend in the economy, when many people were unemployed. Despite that, CIS continues to enroll between 1200-1400 students each academic year.



Source: ECC Institutional Research data

B) Course grade distribution

The spreadsheet below indicates the course grade distribution from fall 2014 through spring 2018.

	A		B		C		P		D		F		NP		Inc P		Inc NP		DR		W		Head-count
2014 Fall	157	26.0%	174	28.9%	96	15.9%		0.0%	23	3.8%	57	9.5%	1	0.2%		0.0%		0.0%		0.0%	95	15.8%	603
2015 Spring	171	28.4%	183	30.3%	131	21.7%		0.0%	27	4.5%	57	9.5%		0.0%		0.0%		0.0%		0.0%	130	21.6%	699
2015 Fall	198	32.8%	178	29.5%	112	18.6%		0.0%	30	5.0%	61	10.1%		0.0%		0.0%		0.0%		0.0%	113	18.7%	692
2016 Spring	146	24.2%	213	35.3%	120	19.9%	11	1.8%	38	6.3%	47	7.8%	2	0.3%		0.0%		0.0%		0.0%	79	13.1%	656
2016 Fall	194	32.2%	149	24.7%	99	16.4%	26	4.3%	18	3.0%	31	5.1%	1	0.2%	-	0.0%	-	0.0%		0.0%	96	15.9%	614
2017 Spring	153	25.4%	160	26.5%	118	19.6%	6		45	7.5%	42	7.0%									95	15.8%	619
2017 Fall	258	42.8%	168	27.9%	92	15.3%	-		25	4.1%	38	6.3%	-								84	13.9%	665
2018 Spring	167	27.7%	203	33.7%	120	19.9%	-		24	4.0%	39	6.5%	-								69	11.4%	622

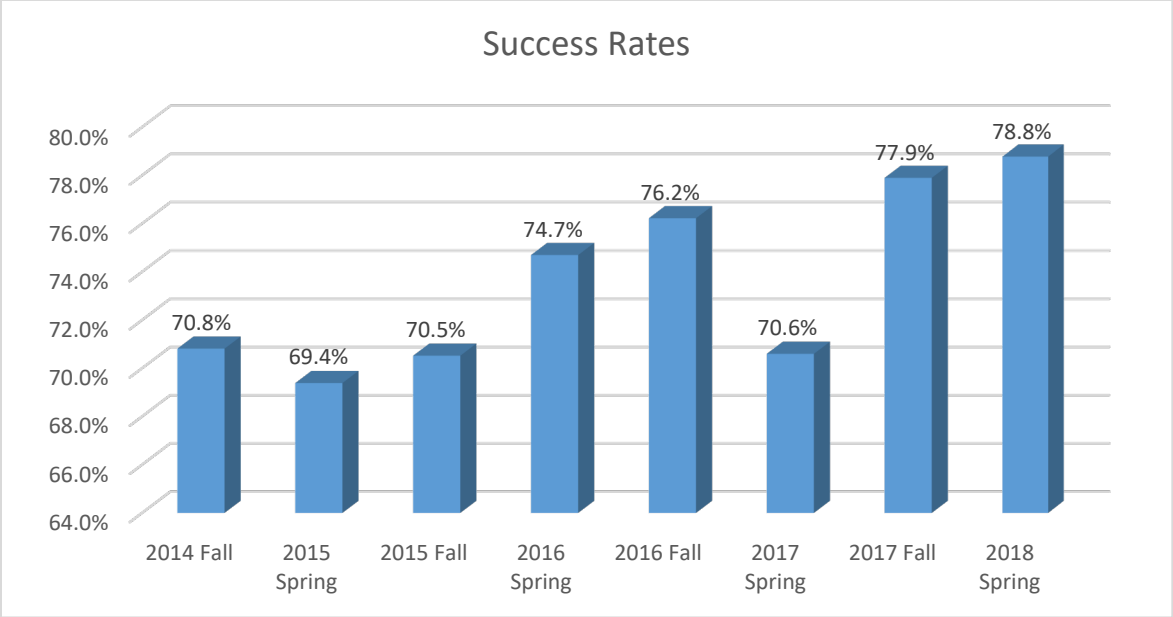
Source: ECC Institutional Research data

Of the total number of our students who finished a course and received a grade, 33.1% (1,444/4,362) received A's, 65.8% (2,872/4,362) received either an A or a B, and 86.2% (3,760/4,362) received an A, B or C.

C) Success rates

Discuss your program's success rates, addressing any issues of student equity and how your program is addressing any performance gaps. Describe any demographic success characteristics and set a success standard for your program.

The "success rate" is the percentage of students (including all students who were enrolled at census date regardless of whether they withdrew later) who received a C/CR or better as a final course grade. The three charts below indicate a) overall success rates, b) demographic success rates for fall semesters, and c) demographic success rates for spring semesters.



Source: ECC Institutional Research data

		Fall 2014 Success	Fall 2015 Success	Fall 2016 Success	Fall 2017 Success
Ethnicity	African-American	59.0%	57.0%	64.4%	63.8%
	Amer. Ind. or Alaska Native	100.0%	50.0%	66.7%	
	Asian	79.1%	75.8%	77.3%	87.5%
	Latino	65.7%	69.5%	75.3%	74.6%
	Pacific Islander	75.0%	0.0%	50.0%	25.0%
	Two or More	58.3%	77.1%	90.6%	87.0%
	Unknown or Decline	88.9%	88.9%	57.1%	66.7%
	White	78.0%	78.5%	83.9%	87.3%

Source: ECC Institutional Research data

		Spring 2015 Success	Spring 2016 Success	Spring 2017 Success	Spring 2018 Success
Ethnicity	African-American	54.8%	64.7%	57.9%	63.8%
	Amer. Ind. or Alaska Native	100.0%	0.0%	100.0%	
	Asian	82.4%	74.8%	78.1%	87.9%
	Latino	64.6%	71.2%	68.0%	75.5%
	Pacific Islander	75.0%	100.0%	100.0%	100.0%
	Two or More	80.0%	82.9%	80.8%	81.3%
	Unknown or Decline	87.5%	85.7%	80.0%	100.0%
	White	77.4%	87.9%	74.3%	83.0%

Source: ECC Institutional Research data

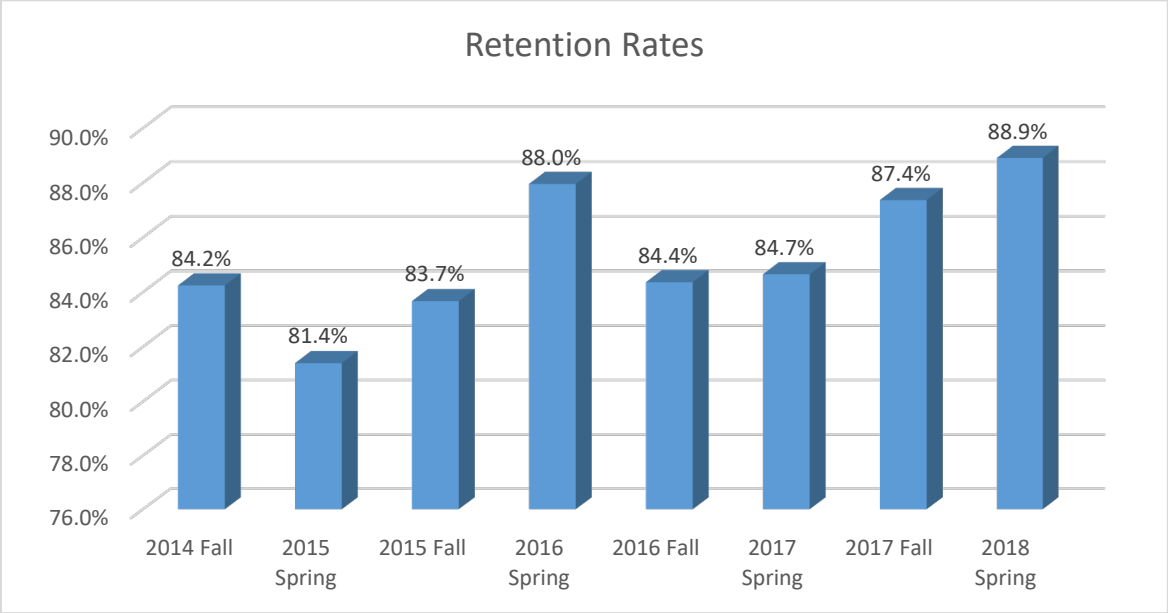
The data indicates a fairly consistent increase in our student's success rates from 70.8% to 78.8% over the last eight semesters. In comparison, the college's success rate for all programs over the same time span was 71.6%.

Whereas the college's success rate for all programs during this time frame was 71.6%, the success rates for our African-American students was consistently the lowest, ranging between 54.8% and 64.7% each semester.

The CIS faculty members have attended seminars offered by SER (Student Equity Re-envisioned), a College-wide committee that promotes student equity and diversity. Faculty members gained additional information and valuable insights about various options such as College Readiness courses, Student Services, Basic Skills programs, and Organizational learning. Special emphasis was laid on closing the achievement gap in higher education, and how those principles could be used in the CIS department. One of the principles discussed mentioned the need for minority role-models. The CIS department does employ multiple faculty members from minority communities that will, hopefully, help address this factor.

The CIS department aims to close the performance gap and increase the success rates of Latino and African-American students by adhering to the principles listed above and by offering services such as Open labs, Free CIS tutoring, and additional learning resources.

D) Retention rates - *if applicable, include retention based on placement method*



Source: ECC Institutional Research data

Our retention rates have improved from those reported on the 2015 Program Review, and have remained fairly stable with a 7.5% variance between our highest (88.9%) and lowest (81.4%) rates during the last eight semesters. The college's retention rate for all programs over the same time span was 84.1%. This may be in part attributable to the expansion of, and marketing of, our curriculum

E) A comparison of success and retention rates in face-to-face classes with distance education classes

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 below. When reviewing the Institutional Research 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. The most recent semesters reflect CIS meeting/exceeding the ECC rates.

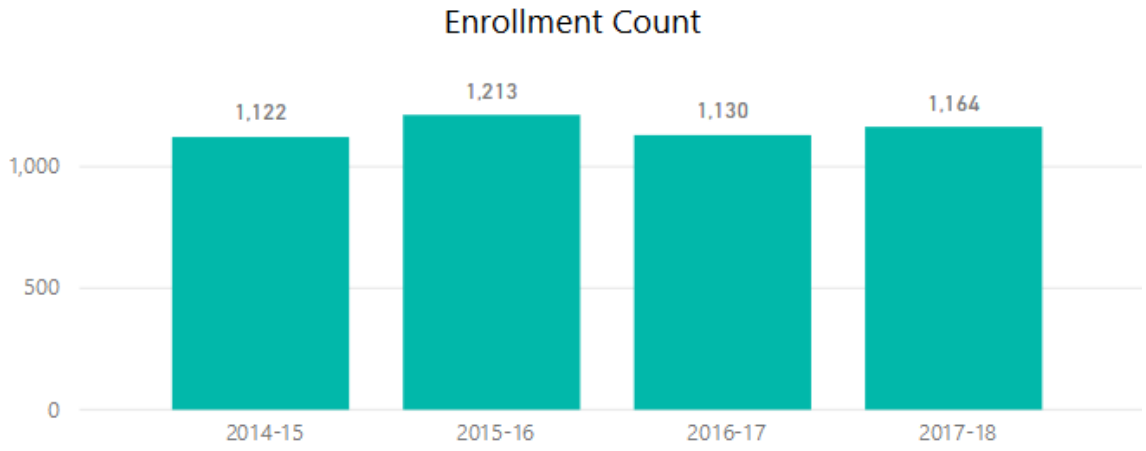
	Success Rates		Retention Rates	
	Face-To-Face	Distance Education	Face-To-Face	Distance Education
2014 Fall	71.6%	62.3%	84.7%	77.4%
2015 Spring	69.8%	62.5%	81.6%	77.5%
2015 Fall	71.8%	55.6%	85.1%	66.7%
2016 Spring	74.5%	76.5%	86.1%	84.3%
2016 Fall	77.6%	60.8%	80.6%	72.5%
2017 Spring	70.7%	69.8%	83.7%	83.7%
2017 Fall	78.5%	72.5%	88.1%	81.2%
2018 Spring	79.0%	76.3%	89.2%	86.4%

Source: ECC Institutional Research data

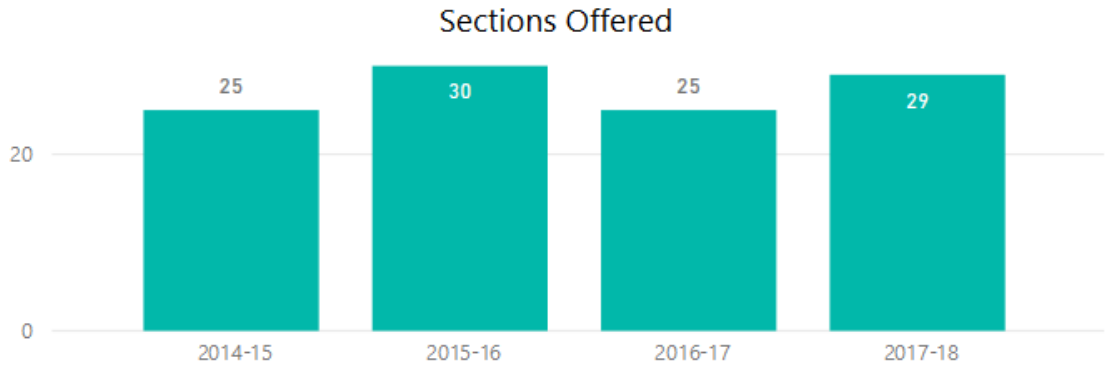
ECC Success Rate: 71.6%

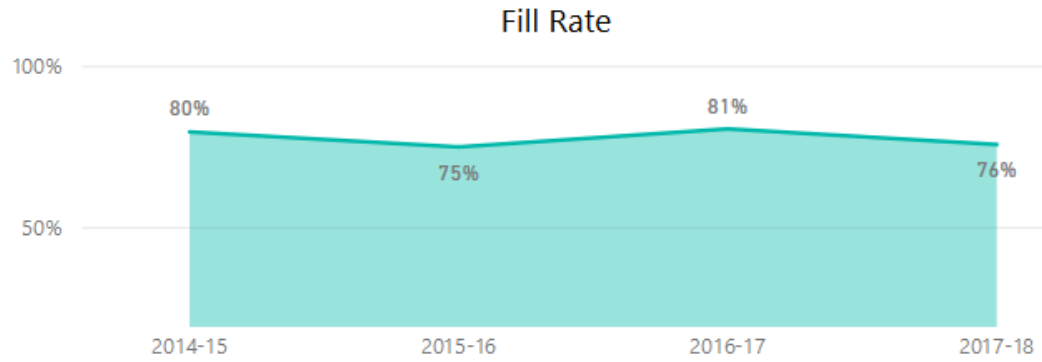
ECC Retention Rate: 84.1%

F) Enrollment statistics with section and seat counts and fill rates

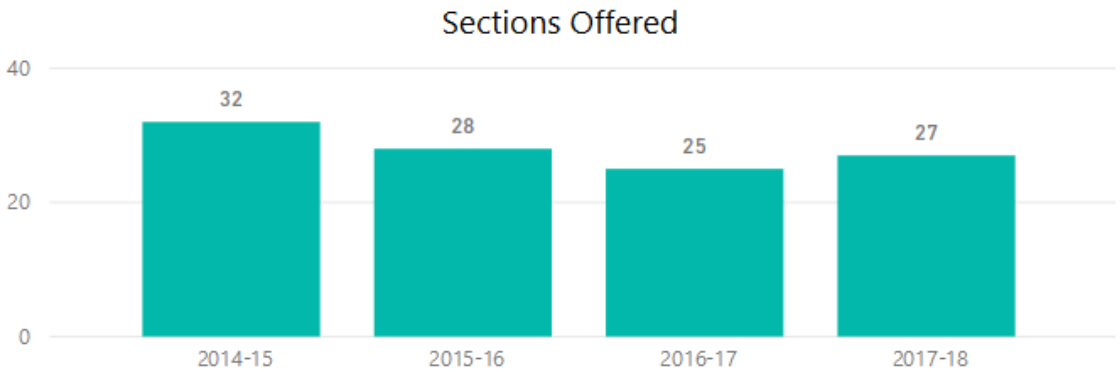


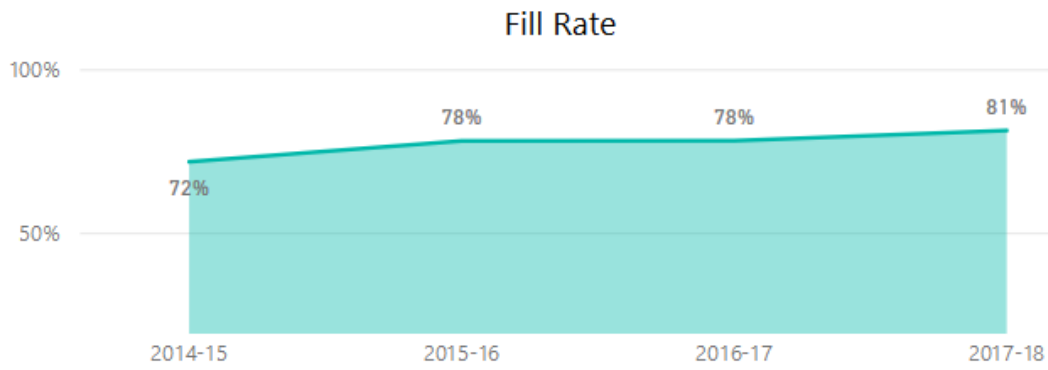
Fall


Sections Offered
25
30
25
29
20
0
2014-15
2015-16
2016-17
2017-18

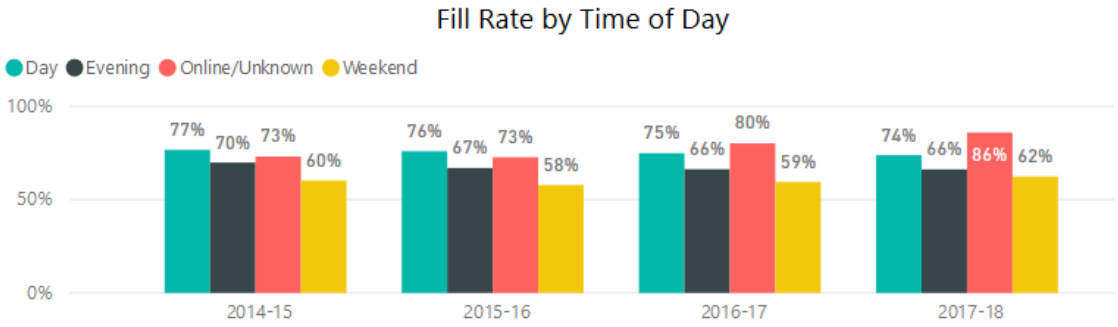

Fill Rate
100%
80%
75%
81%
76%
50%
2014-15
2015-16
2016-17
2017-18

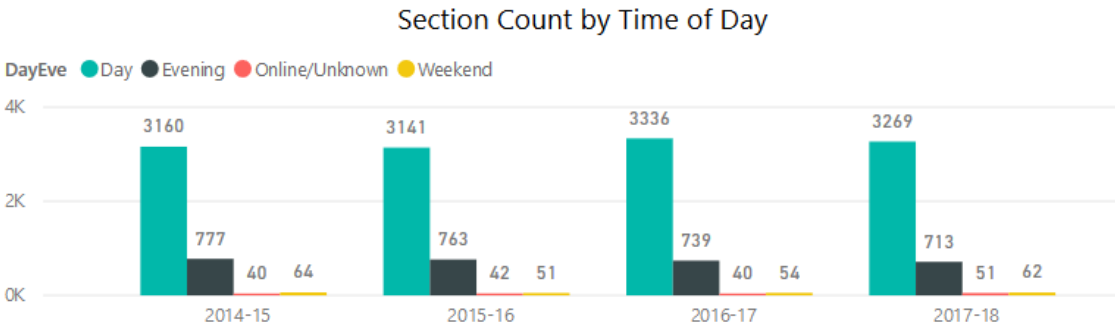
Spring


Sections Offered
40
32
28
25
27
20
0
2014-15
2015-16
2016-17
2017-18


Fill Rate
100%
78%
78%
81%
72%
50%
2014-15
2015-16
2016-17
2017-18

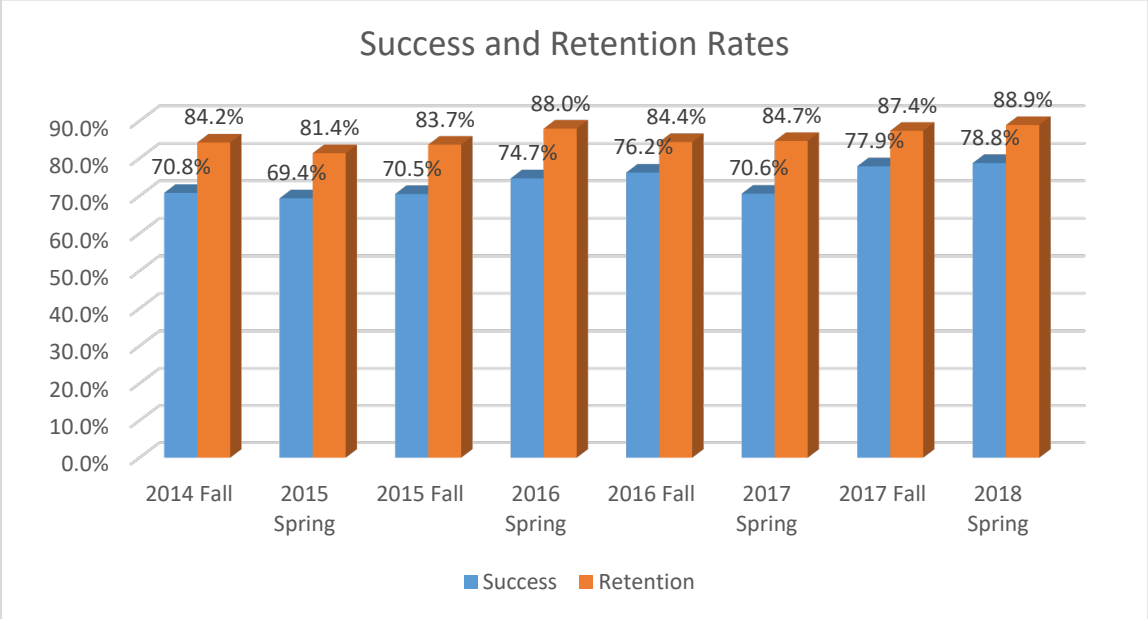
G) Scheduling of courses (day vs. night, days offered, and sequence)





Our scheduling decisions have been determined by what our students indicate they want through their responses on surveys administered from 2015 through 2019, and the department will continue to adjust its future course offerings taking our student's preferences into consideration. We also try to schedule many of our CIS 13 classes to coincide with the end of a Math class as they are offered in the same building and would make the "commute" easier. Advanced classes are typically scheduled every other semester.

H) Improvement Rates (Course success by placement method, if applicable)



The data shown above were supplied by Institutional Research, and indicates that our success and retention rates for the last eight semesters have remained fairly consistent.

The titles and data shown above were supplied by Institutional Research. It has been suggested 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 is 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.

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.

I) Additional data compiled by faculty.

None

J) Enumerate any related recommendations.

1) Skilled 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 labs 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 our programs only by searching on their own. Currently, our website experience offers a very consistent look and feel with the rest of the college. However, the website itself is not updated very often, and feels dated, lacking any department-specific social media presence. An updated department web page would help present information about the program, degrees, courses and certificates as it currently does, but a new section with news and social media will provide additional information for students to decide if our program is the right one for them. For example, links to highlight student success stories can be posted on the web site and shared using social media. Additionally, special events and promotional videos can also be hosted and shared on this platform

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 is unaware of the breadth and depth of the CIS programs offered.

SECTION 3
Curriculum

Review and discuss the curriculum work done in the program during the past four years, including the following:

A) Provide the curriculum course review timeline to ensure all courses are reviewed at least once every 6 years.

COURSE	CTE	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022
CIS 2	Y	X	X		X		2 YR	
CIS 11	Y	X	X		X		2 YR	
CIS 13	Y		X		X		2 YR	
CIS 16	Y	X	X		X		2 YR	
CIS 18	Y	X		X		2 YR		2 YR
CIS 19	Y	X	X		X		2 YR	
CIS 26	Y	X	X		X		2 YR	
CIS 28	Y	X		X		2 YR		2 YR
CIS 29	Y	X	X		X		2 YR	
CIS 30	Y		X		X		2 YR	
CIS 40	Y	2 YR	X		X		2 YR	
CIS 80	Y	X		X		2 YR		2 YR
CIS 84	Y			NEW		2 YR		2 YR
CIS 95 (formerly 95/96abcd)	Y	X						CCC Chair
CIS 99 (formerly 99abc)	Y						CCC Chair	
CIS 119	Y	NEW		X		2 YR		2 YR
CIS 120	Y			X		2 YR		2 YR
CIS 121	Y			X		2 YR		2 YR
CIS 122	Y		NEW	X		2 YR		2 YR
CIS 132	Y			NEW		2 YR		2 YR
CIS 133	Y	X	X		X		2 YR	
CIS 134	Y	2 YR	X		X		2 YR	
CIS 136	Y	X	X		X		2 YR	
CIS 140	Y	X		X		2 YR		2 YR
CIS 141	Y	X		X		2 YR		2 YR
CIS 142	Y	X		X		2 YR		2 YR
CIS 143	Y	X		X		2 YR		2 YR
CIS 150	Y				NEW		2 YR	
CIS 152	Y				NEW		2 YR	
CIS 154	Y				NEW		2 YR	
CIS 156	Y				NEW		2 YR	

B) Explain any course additions to current course offerings.

1) CIS 2; Office Applications
2) CIS 84; MySQL Database Programming for The Web
3) CIS 119; Computer Security and Forensics
4) CIS 120; Cybersecurity Programming
5) CIS 122; Ethical Hacking
6) CIS 132; Web Development Using HTML5, CSS3, and WordPress
7) CIS 137; Computing Network Fundamentals
8) CIS 150; Cloud Computing with Amazon Web Services (AWS)
9) CIS 152; Data Storage with Amazon Web Services (AWS)
10) CIS 154; Compute Engines with Amazon Web Services (AWS)
11) CIS 156; Security with Amazon Web Services (AWS)

CIS 2 (a 3-unit course) that includes training on word processing, spreadsheets, presentation graphics, databases and email management replaced CIS 3 (a 1-unit course), as it only covered word processing and spreadsheets. The inclusion of the additional topics was needed to satisfy the requirements of the Business Information Systems Worker certificate.

CIS 84 and CIS 132 were added to offer training in topics that are in demand, necessary for success in the associated programs, but not yet previously offered.

CIS 119 and CIS 122 are the first two courses to be offered in our Cybersecurity Program.

The CIS 150 - 156 series prepares students to obtain a foundational certification in Amazon Web Services (AWS).

C) Explain any course deletions and inactivation's from current course offerings

CIS 3; Introduction to Microcomputer and Software Applications
CIS 50; Special Topics in Computer Information Systems

CIS 3 was replaced with CIS 2 (as noted above in section 3B) since it no longer fulfilled the rigor required of the Business Information Systems Worker certificate.

CIS 50 was a "special topics" course, and was inactivated since it had not been offered in several years.

D) Describe the courses and number of sections offered in distance education. (Distance education includes hybrid classes.)

	CIS 13		CIS 142		CIS 143	
	Online Sections	# Of Students	Online Sections	# Of Students	Online Sections	# Of Students
2014 Fall	1	30	1	7	1	16
2015 Spring	1	40				
2015 Fall	1	38			1	16
2016 Spring	1	36	1	15		
2016 Fall	1	34	1	11	1	6
2017 Spring	1	43				
2017 Fall	1	69				
2018 Spring	1	59				

CIS 13 (Computer Information Systems) is the department's introductory class that serves as a pre-requisite for many of the advanced classes. CIS 142 (Local Area Network Switching and Wireless) and CIS 143 (Accessing the WAN) are the third and fourth classes in the series of four CISCO classes. We are offering a fully online section of CIS 13 this fall to support the Online Retail Management Certificate program by the Business department.

E) Discuss how well the courses, degrees, or certificates meet students' transfer or career training needs.

1. Have all courses that are required for your program's degrees and certificates been offered during the last two years? If not, has the program established a course offering cycle?

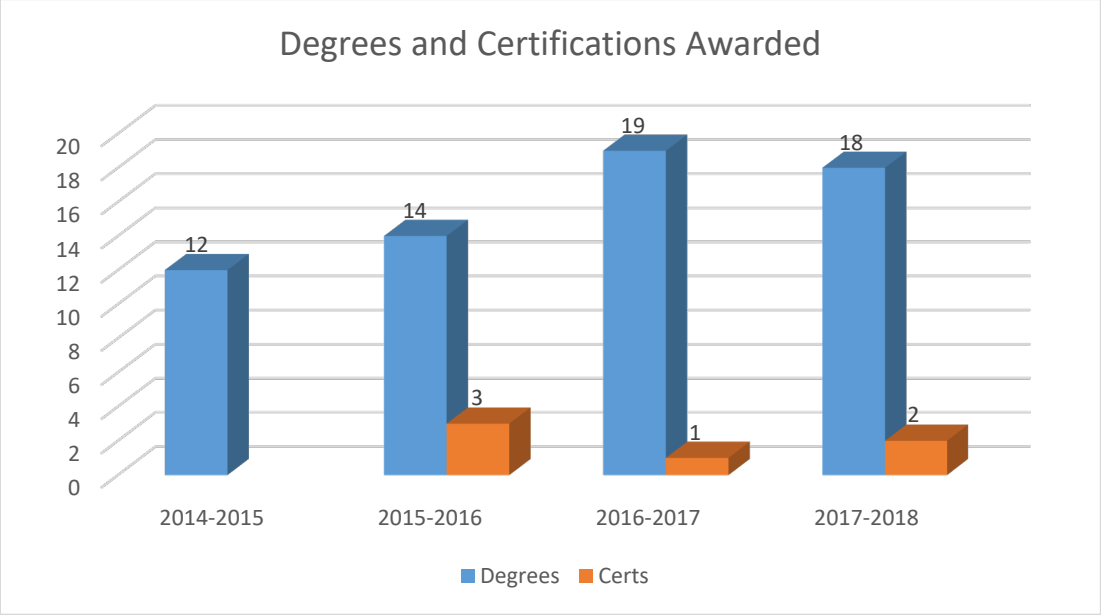
The data below shows that all courses that are currently part of the program's degrees and certificates have been offered within the last two years with the exception of CIS 137 (Computer Networking Fundamentals). CIS 137 is a new course that could not be offered until it appeared in the college's catalog. CIS 80 was specifically focused on database programming using the ORACLE platform. Interest in that class diminished, so the CIS department modified the course to shift the focus from ORACLE to SQL, which is used across all database platforms. CIS 30 is being retired; since its course material is now adequately covered in CIS 134 and several other Business department courses. The advanced CISCO courses, although taught online, do not always fill. The CIS department may decide to inactivate the CISCO program. To prepare for that CIS is developing an educational path in networking and tech support, which does not rely on the CISCO platform.

Course	2019 Sp	2018 F	2018 Sp	2017 F	2017 Sp
11		X		X	
13	X	X	X	X	X
16		X		X	
18	X		X		X
19	X	X	X	X	
26	X	X	X	X	X
28	X	X	X	X	X
29				X	
30				X	Can
40		X		X	
80	X		Can		
119	X	X	X	X	
122		X			
133		X		X	
134	X		X		X
136	X		X		X
137					
140	X	X	X	X	X
141	X	Can	X	X	X
142		X	Can	Can	
143	X	Can		Can	

2. **Are there any concerns regarding program courses and their articulation to courses at other educational institutions?**

   Several of the CIS courses articulate to the CSU/UC systems. We recently checked with the college's Articulation Office, and received confirmation that the CIS Department has no current concerns regarding articulation.

3. **How many students earn degrees and/or certificates in your program? Set an attainable, measurable goal related to student completion of the program's degrees/certificates.**



There were only 3 certifications available during the time frame covered by this program review. We expect the number of certifications awarded in the future to increase since extensive curriculum revisions has led our department to now offer 8 certifications.

4. **Are any licensure/certification exams required for program completion or career entry? If so, what is the pass rate among graduates? Set an attainable, measurable goal for pass rates and identify any applicable performance benchmarks set by regulatory agencies.**

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

Although not required for career entry, there are 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.

Additionally, there is a Cybersecurity exam offered by CompTIA as well as AWS certification exams.

F) Enumerate any related recommendations.

Develop Certificates of Accomplishment for each Certificate of Achievement. This will let student attain a sense of achievement and position them to successfully progress towards the Certificate of Achievement or A.S. Degree.

SECTION 4
Assessment of Student and Program Learning Outcomes (SLOs & PLOs)

A) Provide a copy of your alignment grid, which shows how course, program, and institutional learning outcomes are aligned.
See Appendix A (pages 45 - 59)

B) Provide a timeline for your course and program level SLO assessments. (This will be Appendix B.)
See Appendix B (pages 60 - 64)

C) 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 the skills that 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 database programming, cybersecurity, web development, and Amazon Web Services, and certificates for Business Information Worker, Database Management, Business Programming, Computer User Support, Cybersecurity, AWS, and Business Information Worker.

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

Our assessment process has discovered problematic issues where:

1. The phrasing provided to the students needed to be made more specific (i.e. changing the acronym TPS to Transaction Processing System)
2. Faculty needed to devote more time explaining concepts like computer networks and computer security

D) Describe how you have improved your SLO/PLO assessment process and engaged in dialogue about assessment results.

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

CIS 13 is our core introductory class that represents almost 70% of our total enrollments each year, since it serves as a pre-requisite for many of our advanced classes. With this in mind, the department has committed to assess all of the associated CIS 13 SLOs each and every year. This will allow the assessment process to be consistent from year to year, and will ensure that any deviations from the norms or difficulties encountered can be corrected quickly.

E) Enumerate any 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 (virtual reality and augmented reality 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.

SECTION 5
Analysis of Student Feedback

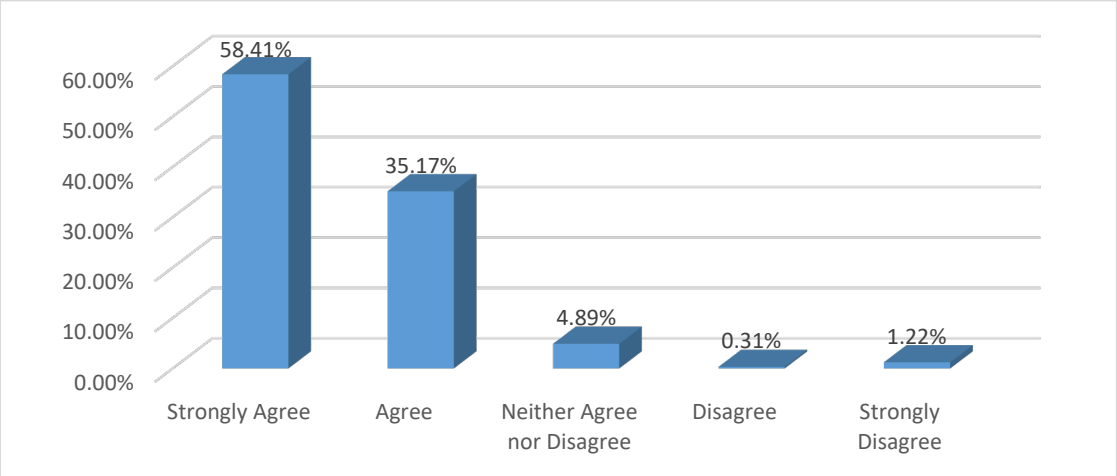
Provide a copy of any feedback reports generated by Institutional Research and Planning for your program. Review and discuss student feedback collected during the past four years including any surveys, focus groups, and/or interviews.

A) Describe the results of the student survey in each of the following areas:

Source (Section 5A): IR Student Survey administered by CIS Department Spring, 2019

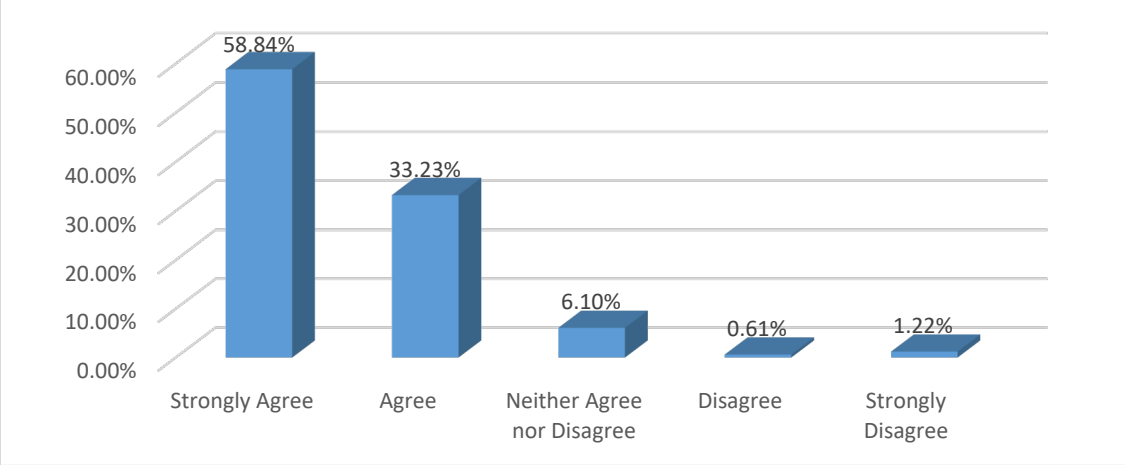
1. Student Support

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



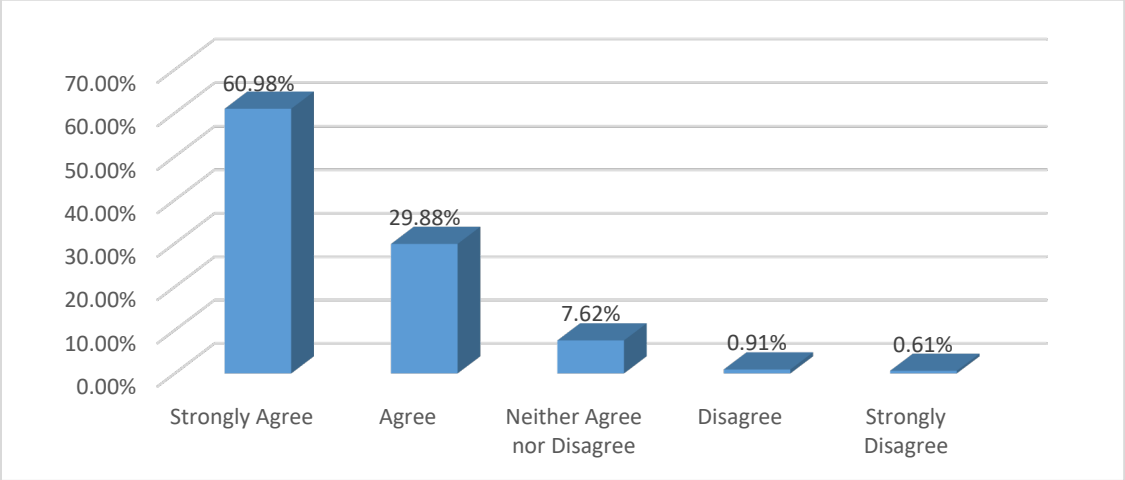
It is reassuring to our department members that 93.58% of our students responded either Strongly Agree (58.41%) or Agree (35.17%) to this question, and less than 1.25% responded negatively.

- Instructors in this program have helped me stay on track



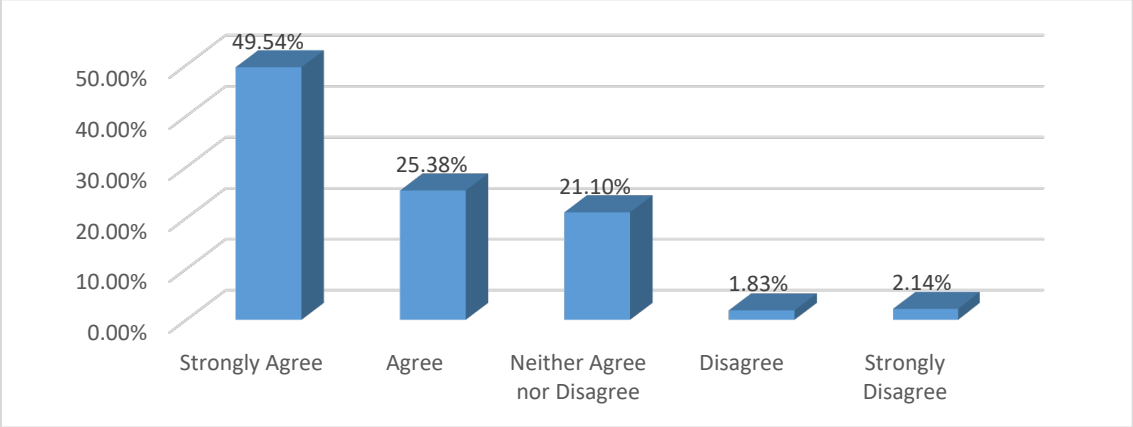
92.07% of our students responded either Strongly Agree (58.84%) or Agree (33.23%) that we have helped them stay on track.

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



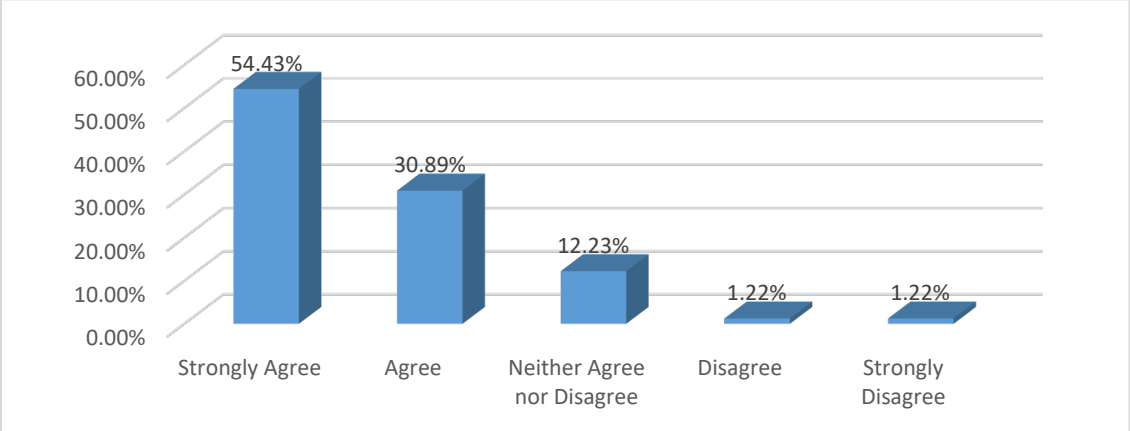
Still in the ninety percent range, the responses here were Strongly Agree (60.98%) or Agree (29.88%) for a combined percentage of 90.85%.

- I have felt a sense of community within this program



For both the current (2019) and 2015 Program Review, the "Neither Agree nor Disagree" responses hover just below 25%. This rate is noticeably higher than others in this section, and due to conversations with some or our students could be attributed to confusion on their part as to what this question is actually asking. Sense of community can be attained when students work together on project or tasks. This doesn't always hold true in all of our courses, especially those taught online.

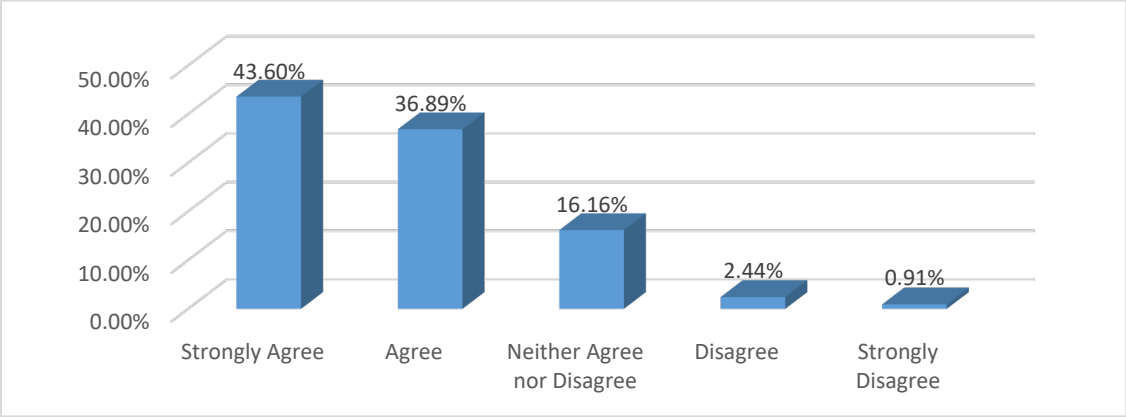
- Student contributions have been valued by instructors in this program



The positive response rate for this question 4 years ago was 80.05%. Even though it has increased, the positive response rate (85.32%) between Strongly Agree and Agree was the second lowest in "Student Support" section

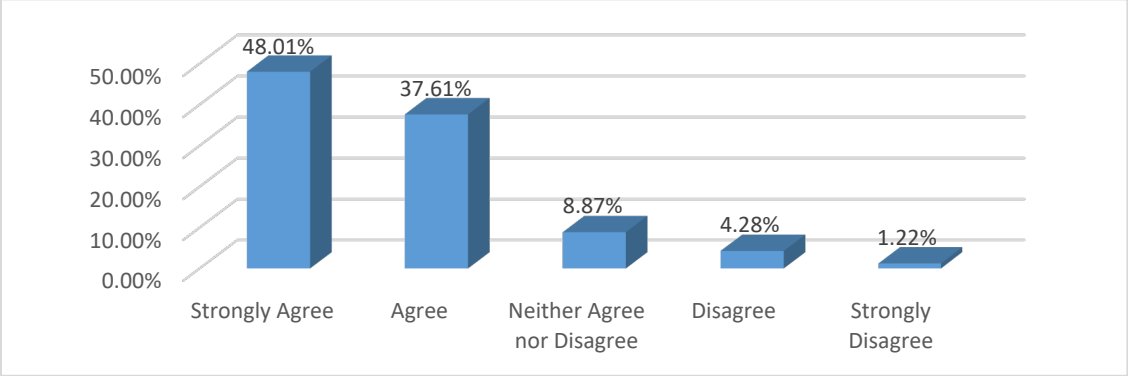
2. Curriculum

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



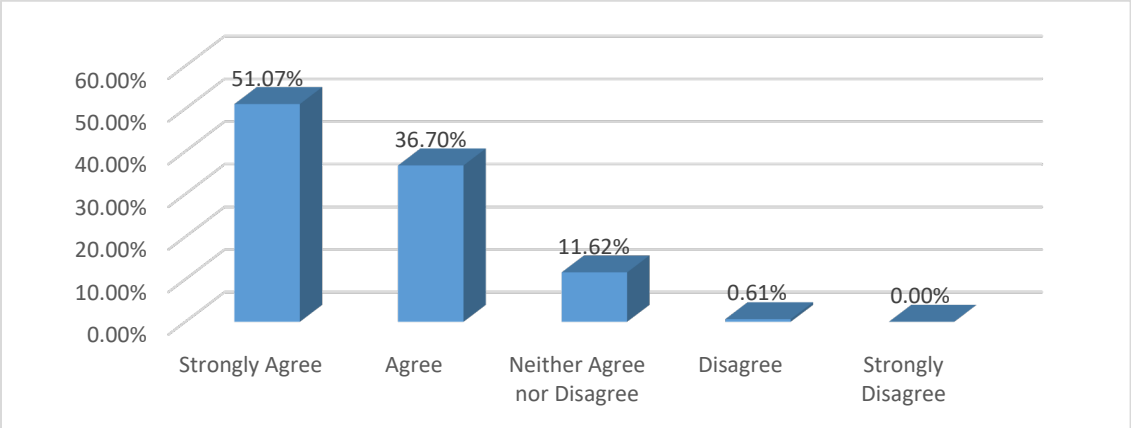
Although the combined negative responses are low (3.35%), the combined positive responses (80.49%) are a little lower than we would like. This is in part due to the 16.16% of the respondents who answered "Neither Agree nor Disagree" who may be non-CIS majors who have no real interest in the classes we offer other than that which is required (CIS 13) of them.

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



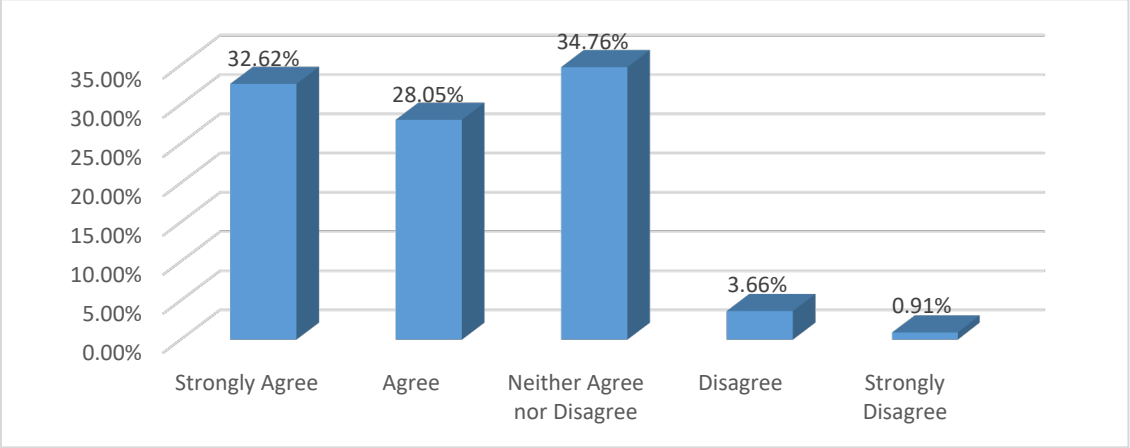
85.62% of the respondents replied positively. We are looking into a follow-up question the next time the survey is administered as to the reasons why the 5.50% who responded negatively could not register for the classes they needed.

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



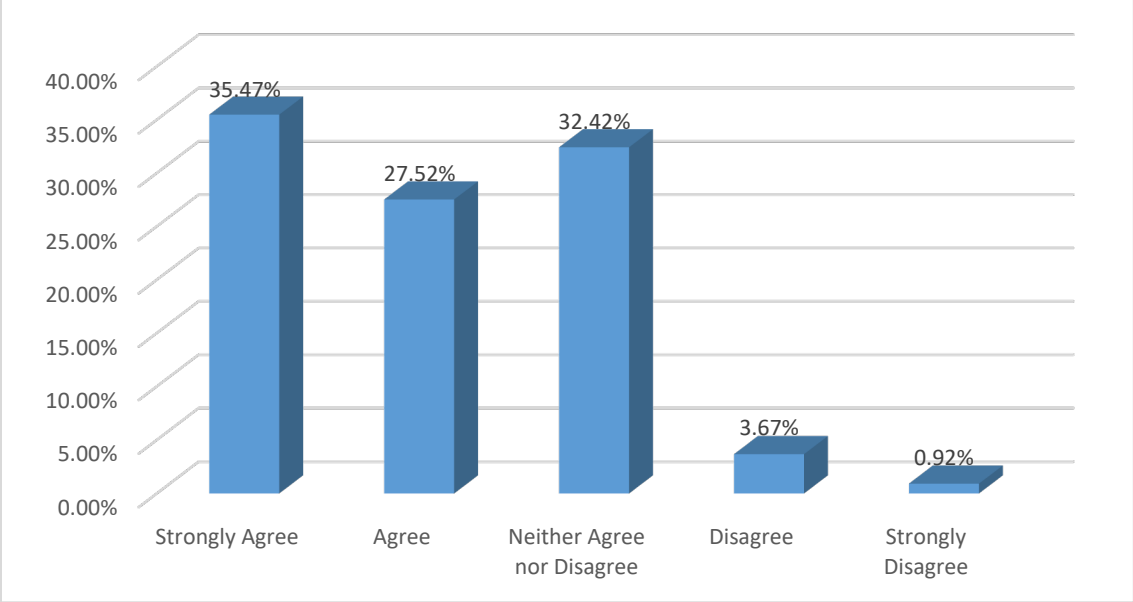
87.77% of the students responded favorably (Strongly Agree or Agree). There was a fairly larger percentage of "Neither Agree nor Disagree" here compared to other questions. This could be attributed to the non-CIS majors who only need to take CIS 13 for their major, and are unaware of, or have no interest in the rest of the courses offered by the department.

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



Even though less than 5% of our students replied negatively, over one-third (34.76%) replied "Neither Agree nor Disagree" to this question. Although there are Computer and Cybersecurity Clubs, and have been "Cloud Day", "Cyber Day" and "Technology Fair" presentations it seems that only a small percentage of our students are aware of them despite our marketing efforts.

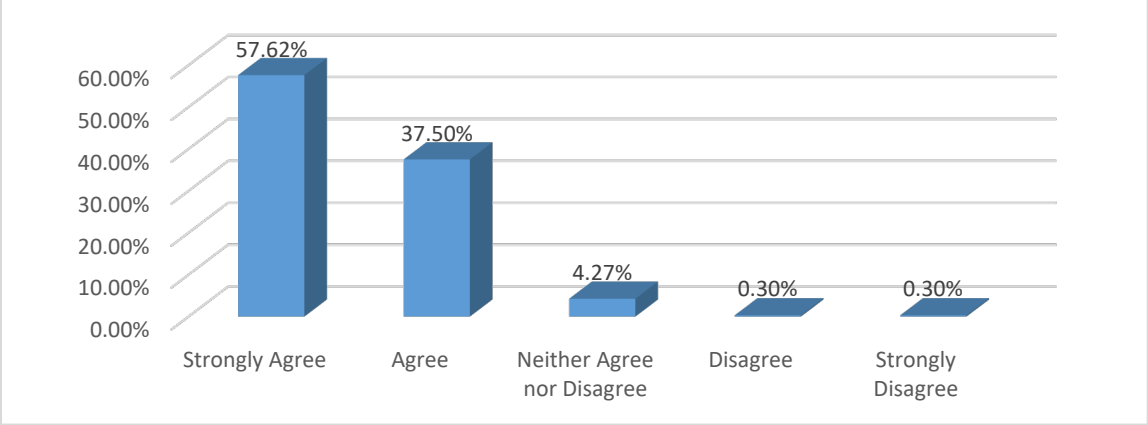
- The Library Resource Unit (LLRU) has the resources to help me succeed in this program



Although the negative responses are less than 5%, the positive responses are only a little over 60 %, with the remainder (over one-third) being non-committal. This is not 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 may not feel the need to travel to the LLRU.

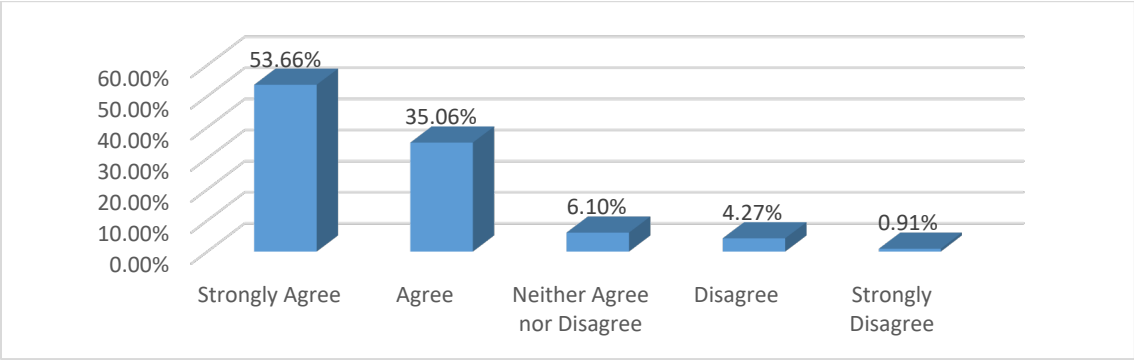
3. Facilities, Equipment, and technology

- The buildings and classrooms used by this program are satisfactory



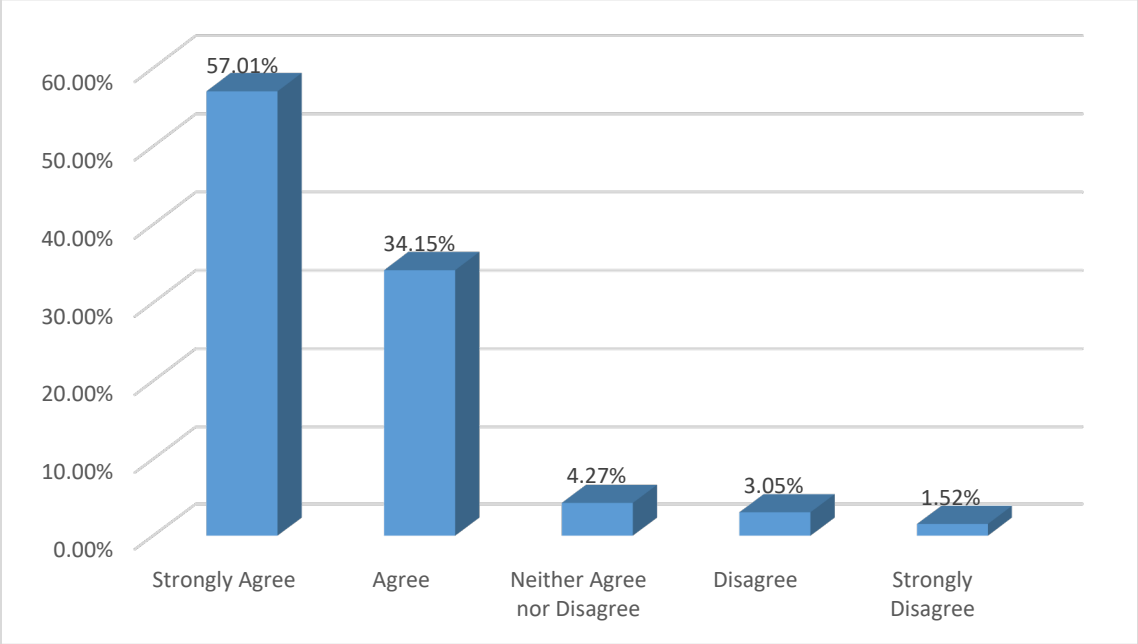
The Math/Business/Allied Health (MBA) building that houses the CIS Department is just over 5 years old, so it comes as no surprise that the combined Strongly Agree or Agree response rate on this question is 95.12%.

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



Here, the Strongly Agree or Agree response rate is 88.72%.

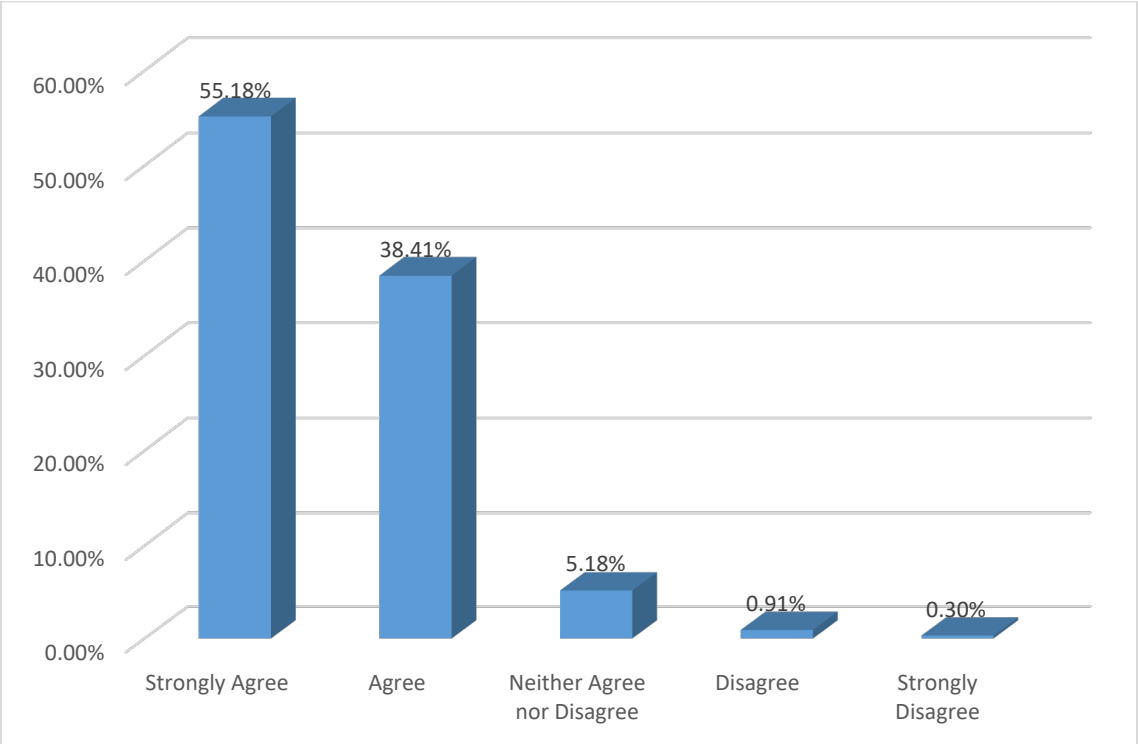
- I am satisfied with the computers and software used in this program



The combined Strongly Agree or Agree response rate is 91.16% as we continue to upgrade the Microsoft operating system and application software used by the students to the most recent versions available.

4. 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



This question is always of particular importance to our department. The Business Division administrative and clerical staff reviews every instructor's syllabi to ensure 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 combined negative (Disagree or Strongly Disagree) response rate of less than one and one-quarter percent.

B) Discuss the implications of the survey results for the program.

Based on their responses, our students: a) feel that the CIS Department instructors have helped them stay on track in order to achieve their academic goals, b) are happy with the breadth of our curriculum offerings, 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 3.39% 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

C) Discuss the results of other relevant surveys.

None

D) Enumerate any related recommendations.

1) Continue to modify the questions in the student survey as our courses change and programs grow.
2) Promote a campus AWS Deep Racer racing club to encourage students to explore cloud computing applications with a tangible object. Work with other college campuses to develop and promote an AWS Racing League where schools can compete in a friendly competition while providing an engaged, rich learning environment for Cloud Computing.
3) Work with our advisory board and other industry partners to develop internship opportunities. Internship opportunities may be based on real-world projects that can be solved based on pursuit of a degree or certificate. A measure of success should be established; follow-ups with the company and the student intern should be conducted to evaluate if the internship was successful and how to improve the results of the program. An existing business may work with the school to provide a number of projects that need to be done that can be worked on after completion of certain classes. For example, a company may have a need for a SQL database project and can work with the school to identify students for internships after completion of the database programming course.
4) Have our CIS faculty members to spend at least part of one lecture in each CIS-13 class discussing various programs offered by the CIS department.
5) Arrange to have CIS faculty members to take CIS-13 students on at least one field trip to a local IT company as an extra-curricular activity.
6) Events such as Cloud Day, Cybersecurity Day, CIS Career Day, and Technology Fair etc. should be held regularly at least once a year (ideally once a semester).

7) Invite a librarian or a staff member from LLRU to each CIS class to inform students of the resources available at the library.

SECTION 6
Facilities and Equipment

A) Describe and assess the existing program facilities and equipment.

The MBA building is only a few years old, and does not present any problems. Equipment, however, is a different matter. As technology, and the subjects we offer change rapidly, we have been trying to stick to our original three-year cycle of upgrading our hardware so that students will not feel that they are being trained on obsolete computers.

B) Explain the immediate (1-2 years) needs related to facilities and equipment. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

1) We need to adhere to a schedule of replacing the personal computers used in our classrooms.
2) NETLAB VE and the servers to host NETLAB is essential equipment that is needed to continue providing Virtual Machines for students to practice concepts and techniques in a safe environment. NETLAB provides training for students with the concepts that are taught in most of the cybersecurity courses, which applies to industry certification exams.

Item	Price
Netlab+ VE 32	$2,995 Annual License & Software Support

3) Students enrolled in CIS 40 (Personal Computer Support and Networking) will need proper tools and computer components to get the most out of the class. This includes basic hardware tools such as screwdrivers for PCs and mobile devices and electrostatic wristbands. This will provide students with a better understanding and engagement of the material covered in the class.
4) Enrollment for CIS 40 is limited to 22 students each year. Tools should be ordered for 25 students, which will account for damaged or lost tools. Every year, a minimum of 25 set of tools should be maintained, replenishing any that have been lost or damaged. PC hardware tools rarely ever change so there will not be a need to refresh the toolset every few years.
5) Consider a device donation, where old, working or non-working mobile devices, tablets, and computers can be donated to the department for students in CIS 40 to take apart without any worry of damage. A further study of the safety and liability of such a program should be considered.

PC Tools (Initial Cost)

Item	Unit Cost	Qty	Amount
PC Tools	$30	25	$750
Storage box for tools	$25	1	$25
Total			**$775**

6) The Cloud Computing program at El Camino College will need to be steadily developed as the full range of courses are eventually offered. Several pieces of hardware should be made available for students to explore to further their learning:
7) Amazon has a tangible device that demonstrates their compute engine in the cloud in the AWS DeepRacer. This directly relates to what students will learn in CIS 154 (Compute Engines with AWS). Furthermore, the AWS DeepRacer will introduce students to concepts of machine learning

and Internet of Things (IoT). These are concepts in computer information systems that are rapidly gaining traction in the industry. A greater challenge is determining a facility or lab large enough to assemble a track that is useful for learning.

8) Additionally, Cloud Computing projects arising from the use of Echo Dots and Raspberry Pi's will also aide in student understanding of cloud computing concepts.

Amazon Deep Racer (Initial Cost)

Item	Unit Cost	Qty	Amount
AWS Deepracer	$400	12	$4,800
Power Equipment for Charging	$30	3	$90
Portable Track for DeepRacer	$250	1	$250
Total			**$5,140**

Amazon Echo Dot (Initial Cost)

Item	Unit Cost	Qty	Amount
Amazon Echo Dot	$50	25	$1,250
Storage box for Echo Dots	$25	1	$25
Total			**$1,275**

Raspberry Pi Kits (Initial Cost)

Item	Unit Cost	Qty	Amount
Raspberry Pi Kits (Raspberry PI, keyboard/mouse, monitors, power supply)	$165	25	$4,125
Storage box for Raspberries	$25	1	$25
Total			**$4,150**

9) Install data projectors that display systems that work in fluorescent lighting

C) Explain the long-range (2-4+ years) needs related to facilities and equipment. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

1) We need updated computers in ITEC 19 and ITEC 21 lab. The computers in those classrooms are outdated and need to be replaced so students can learn on a computer that meets industry standard in the field of cybersecurity.
2) Five sets of lockpicking tool kits, and practice locks are equipment that is needed for Ethical Hacking CIS 122. It is a part of the physical security section. Having weak locks on doors can be compared to using weak passwords on an account.

Item	Price	Qty	Amount
14 Piece Lock Pick Set(MPXS-14)	$37.95	5	$190.00
Training practice Locks (3)	$44.99	5	$225.00

3) Purchase new Raspberry Pi 4. These are needed for students to get hands-on experience with these devices which are commonly used in the field of cybersecurity.

Item	Price	Qty	Amount
Raspberry Pi 4	55.00	25	$1,375.00
Raspberry Pi 7-inch Touch Screen Case	15.00	25	$600.00

4) It is expected that a certain number of hardware may fail and need to be replaced every year. Some hardware will have a longer useful life than others. In all previous cases, a wireless router/access point will be needed for operation of the instructional devices. This access point will need to be sanctioned by El Camino College Information Technology. and limited in use to the duration of the classes. This access point can be used for approximately 4 years and replaced as newer wireless protocols are used.

Required Networking Hardware (Replace every 4 years)

Item	**Unit Cost**	**Qty**	**Amount**
Router/Access Point	$200	1	$200
Total Cost			**$200**

D. Enumerate specific recommendations based on the information provided above, as well as any related recommendations (e.g., creating and budgeting for a cycle for ongoing maintenance, repair, and replacement).

1) Updates for facilities and equipment are based on keeping up with industry standards. Ensuring that our equipment is up to date allows our students to have the best experience when working on assignments and projects.

2) The estimated maintenance cost is listed below for each of the previously listed equipment costs. This includes the expected number of items to be replaced annually and any parts that have wear and tear including batteries and tires.

PC Tools (Annual Cost)

Item	Unit Cost	Qty	Amount
PC Tools (Est. replacement)	$30	4	$120
Total Cost			**$120**

Amazon Deep Racer (Annual Cost)

Item	Unit Cost	Qty	Amount
AWS Deepracer	$400	1	$400
Batteries	$100	1	$100
Replacement Track for DeepRacer	$100	1	$100
Replacement Tires	$10	5	$50
Total Cost			**$650**

Amazon Echo Dot (Annual Cost)

Item	Unit Cost	Qty	Amount
Echo Dot Replacements	$50	2	$100
Total Cost			**$100**

Raspberry Pi Kits (Annual Cost)

Item	Unit Cost	Qty	Amount
Raspberry Pi Kits (Raspberry PI, keyboard/mouse, monitors, power supply)	$165	2	$330
Total Cost			**$330**

SECTION 7
Technology and Software

A) Describe and assess the adequacy and currency of the technology and software used by the program.

The vast majority of our classes are held in the MBA building, with the few remaining classes scheduled in the COMM (lecture only) and ITEC (lecture and lab) buildings.

All of the computers in the laboratory classrooms run the Windows 10 operating system, Microsoft Office 2019, Microsoft Visual Studio 2017, and Microsoft SQL Server. As we teach computer technology, we strive to have the most current versions installed.

Additionally, we are also using the following software programs on the instructor's computers; 1) Netop Vision to monitor student activities on the computers, and Uteogy to control the overhead projectors.

B) Explain the immediate (1-2 years) needs related to technology and software. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

Given the rapid rate of change in information technology, our department needs to update technology and software on a regular basis in order for our classes to stay current and our students to remain marketable

1) OSForensics software is needed for CIS 120 Computer Forensics. OSForensics is a popular Forensic software which is used for Investigations involving digital evidence. OSForensics also offers a certification that can be earned if students wanted to become certified with using the Program.

Item	Qty	Price
OSForensics	25	10,000.00

2) Forensic Tool Kit (FTK) software is another program needed for CIS 120 Computer Forensics. FTK is a popular tool used in industry and by law enforcement for Digital Investigations. FTK also offers various certifications that can be earned if students wanted to become certified with using the program.

Item	Qty	Price
Forensic ToolKit (FTK)	25	30,000.00

3) Oxygen Forensic Suite is software needed for CIS 120 Computer Forensics, which is used to investigate mobile devices. With a lot of information being stored on cell phones today, it is important for anyone aspiring to become a forensic investigator to understand how to properly extract information from a mobile device.

Item	Qty	Price
Oxygen Forensic Suite	25	30,000.00

4) Burp Suite Professional is software needed for CIS 122 Ethical Hacking. This software is used in testing Web Application Security. It helps a Penetration Tester identify vulnerabilities among a host of many features. Burp Suite is a standard tool used in the industry by most Penetration Testers.

Item	Qty	Price
Burp Suite Professional (1 year)	25	$10,000.00

5) As the Cloud Computing program develops at El Camino College, additional services from AWS will be needed. Amazon Web Services, through their AWS Educate initiative, provides additional service credits that students and faculty can use. Additional credits are given by obtaining an AWS Educate institutional account. The industry is seeing a rapid, and sustained shift to cloud computing resources and there is a demand for skills relating to the transition from traditional IT resources to cloud computing services. One such technology related to this area is VMWare. This will be useful for CIS 154 and CIS 156. Other classes may also benefit from the VMWare platform.
6) VMWare has an annual department subscription costing $250. It provides software licenses to their higher end hypervisor software that will be useful in course labs showing students how to transition from a traditional IT infrastructure to a cloud-based one.

Annual Costs for VMWare Department Subscription to all major VMWare products

Item	
VMWare Department Subscription to all major VMWare products	$250/year

7) Additionally, several classes will benefit from the usage of AWS. These include at the very least CIS 80, CIS 132, and CIS 84. By utilizing AWS for these classes, students will have full access to their personal "servers" at all times. AWS provides the database and web server necessary to run the courses. However, this comes at a cost for AWS usage. Moreover, the services are very reliable. A rough estimate is provided below:

Estimated AWS Usage Costs for CIS courses

Item	
CIS 132 (Wordpress)	$800/semester
CIS 80 (SQL Server)	$100/semester
CIS 84 (MySQL)	$100/semester

Additional courses may be identified for AWS usage as a resource.

C) Explain the long-range (2-4+ years) needs related to technology and software. Provide a cost estimate for each need and explain how it will help the program better meet its goals.

In future semesters, the CIS department will be looking at new and upcoming trends and technologies like Data Analytics and Internet of Things (IoT) among others. We will need to purchase/license the software needed for these new classes (and potential certificates) to keep our CIS program attractive to prospective students.

D) Enumerate specific recommendations based on the information provided above, as well as any related recommendations (e.g., creating and budgeting for a cycle for ongoing maintenance, repair, and replacement).

The results from our student surveys indicate that our students feel that: 1) "Being trained on the same software that corporations would expect you to be experienced with (the most recent versions

available)", and 2) "Using hardware in the computer lab that is capable of running the applications you wish to learn" is "very important" to them.

For these reasons the CIS Department strives to maintain a three-year upgrade cycle on hardware, although budget constraints make it harder every year

SECTION 8
Staffing

A) Describe the program's current staffing, including faculty, administration, and classified staff.

	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
FTEF (full-time equivalent faculty)	4.73	4.78	4.64	4.45	4.93	5.08	5.02	5.37
PTEF (part-time equivalent faculty)	0.17	1.03	2.72	2.62	1.83	1.04	2.48	1.4
Total FTEF	4.90	5.81	7.36	7.07	6.76	6.12	7.50	6.77
FT/PT load ratio	**97/3**	**82/18**	**63/37**	**62/38**	**64/36**	**83/17**	**67/33**	**79/21**

Source: Business Division staff

During the current semester (spring 2019), the CIS Department has five full-time, and three part-time instructors. Of the five full-time instructors;

- Two of them are within one year of planned retirement
- The remaining three have indicated that they have no plans to retire before the next program review cycle

Administration consists of the Business Division Dean, Dr. Virginia Rapp.

The Business Division's classified staff is as follows:

- Dawn Koeller – Administrative Assistant II
- Laurene Linka – Senior Clerical Assistant
- Esperanza Corrado – Administrative Assistant I (CTEA)
- Phan Tran – Clerical Assistant (Temporary Non-Classified)
- Linda Morford – Instructional Associate

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 retrain existing faculty. Unfortunately, most qualified IT personnel gravitate toward jobs in the 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 an individual is competent in a particular subject matter does not mean that they can effectively teach it to others.

B) Explain and justify the program's staffing needs in the immediate (1-2 years) and long-term (2-4+ years). Provide cost estimates and explain how the position/s will help the program better meet its goals.

If the current trend of declining enrollments continues, the department feels that no "*growth*" positions will be needed within the next 1-2 years. However, as two senior full-time instructors who are slated for retirement in June of 2020 cover large portions of the department's overall program

(programming, database management, and systems analysis and design) the department recommends that one replacement full-time new hire take place within one year, and both within two years.

C) Enumerate specific recommendations based on the information provided above, as well as any related recommendations.

1. To replace the two soon to be departing (one year) faculty members, one new full-time hire within one year, and both within two years.

SECTION 9
Direction and Vision

A) Describe relevant changes within the academic field/industry. How will these changes impact the program in the next four years?

Academic Field

1) Education now extends beyond the classroom walls.

With mobile devices (like iPads for example), students are no longer confined to a computer lab. As soon as an assignment is available students can work on it inside their classroom, at home, while waiting on the bus, in between classes, etc.

2) The textbook is becoming extinct.

With all these mobile devices in the classroom, it makes sense that eBooks are becoming more popular. E-books are cheaper, more up-to-date, quickly accessed, and more interactive.

3) There's a change in student and instructor roles

With technology in the classroom the traditional student and instructor roles have changed. The student has become a lot more active and engaged. Rather than the instructor relaying information while the student absorbs it, the instructor has become more of a facilitator than just a dispenser of information.

4) Classrooms are becoming more collaborative

One of the characteristics of the modern classroom is collaboration and technology helps to empower it. With classroom technology students can collaborate with other students and their instructors inside and outside of the classroom quickly and easily.

5) Technology in the classroom allows instructors to deliver more personalized learning

Lessons can be customized to fit each student's progress and learning style. Through these learning tools educators can provide opportunities for students to be able to work and excel at their own level and pace.

Source for section 9A Academic Field 1-5: www.securedgenetworks.com/blog/5-Ways-Technology-in-the-Classroom-is-Changing-Education

Industry

1. Internet of Things (IOT)

One of the biggest tech trends to emerge in recent years is the Internet of Things. Simply put, the Internet of Things (abbreviated IOT) is the idea that all technological devices can be connected to the internet and to each other in an attempt to create the perfect marriage between the physical and digital worlds. How will this impact you? It depends on your industry. For example, for those who work in marketing, advertising, media or business management, IOT could provide a wealth of information on how consumers engage with products by tracking their interactions with digital devices. In turn, this data could be used to optimize marketing campaigns and user experiences.

2. Machine learning

Another exciting emerging technology is machine learning, which is essentially a computer's ability to learn on its own by analyzing data and tracking repeating patterns. For example, social media platforms use machine learning to get a better understanding of how you're connected with those

in your social network. They do this by analyzing your likes, shares and comments and then prioritizing content from your closest connections, serving you that content first.

Machine learning is reshaping the way businesses interact with their customers in a big way by helping them anticipate and meet customer needs more easily.

3. Virtual reality (VR)

Remember watching movies about virtual reality and thinking how cool it would be if it was actually like that in real life? Well, it's about to be. Although VR has been around since the 1950s, until recently the technology wasn't able to deliver the fully immersive digital experience users have been craving. That's about to change with recent improvements to both hardware and programming, and the effects are going to be felt across almost every industry from retail to education.

VR is likely to affect companies across the board as they adopt the technology to help them engage customers more effectively and optimize their sales and marketing efforts.

4. Touch commerce

Being able to buy anything you want with the touch of a finger may have seemed like a fantasy a few years ago, but it's now a reality. Merging touchscreen technology with one-click shopping, touch commerce allows consumers to buy products easily from their phones. After linking their payment information to a general account and enabling the feature, customers are able to buy everything from clothes to furniture with just a fingerprint.

This is one of the biggest innovations to hit eCommerce in recent years with purchases of this type expected to increase by 150% this year alone and retailers in almost every industry anticipating an increase in sales directly related to this new technology.

5. Cognitive Technology

Cognitive technology is in the same vein as machine learning and virtual reality except that it's a broader concept. The cognitive technology umbrella includes things like natural language processing (NLP) and speech recognition. Combined, these different technologies are able to automate and optimize a lot of tasks that were previously done by people, including certain aspects of accounting and analytics.

Deloitte predicts that the industry sector most affected by this trend initially will be the software sector with 95% of enterprise software companies projected to adopt these technologies by 2020.

Source for section 9A Industry 1-5: www.wayup.com/guide/deloitte-313295-sponsored-1-5-technology-trends-need-know-work-industry/

B) Explain the direction and vision of the program and how you plan to achieve it.

The CIS program needs a few things to remain successful.

1) New programs – The department has started offering courses in the relatively new areas of Cybersecurity and Amazon Web Services.

   The cybersecurity program is growing and adding more relevant courses to the program. Our plan is to continue to add additional courses that help students gain skills and knowledge in order to pass certification exams and qualify for jobs in the field of cybersecurity. A Redhat Linux System Administrator I and Red Hat Linux System

Administrator II Course were discussed with our advisory board, and they were in favor of those courses being added to the current curriculum.

2) Both programs offer great potential for enrollment growth, and as such both need to be better publicized and marketed
3) With new CIS-related technologies such as machine learning, virtual reality, augmented reality, Internet of Things (IoT) and mobile platforms, some material could be incorporated into existing classes, and some new classes may need to be introduced. Any new technology path will lead to examination of the CIS curriculum, to add, modify, or remove courses/programs. Changes to the required courses for the degree may be necessary.
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.

C) Enumerate specific recommendations based on the information provided above, as well as any 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 areas, and to strengthen our current programs to make them more robust
    a) Offer a Windows Server course as part of the PC Support & Networking.
    b) Offer Linux administration courses.
        1. A basic one for PC Support
        2. A more advanced one for shell scripting and automation
    c) Offer a Python course. Cybersecurity and Cloud Computing programs will benefit from students having an understanding of Linux and/or Python in order to utilize some of the more advanced services and technology in each respective area.
    d) Offer courses in iOS development/Swift, or React-Native frameworks for cross-platform mobile development for Android, Web, and iOS. This would require a greater non-trivial investment and procurement of a Mac lab as previously suggested and a way to manage the lab.
    e) As Cloud Computing is a must in the modern information technology landscape, add the CIS 150 introduction course as a requirement to the CIS degree

SECTION 10
Prioritized Recommendations

A) Provide a single, prioritized list of recommendations and needs for your program/ department (drawn from your recommendations in sections 2-8). Include cost estimates and list the college strategic initiative that supports each recommendation. Use the following chart format to organize your recommendations.

	Recommendations	Cost Estimate	Strategic Initiatives
1.	Personnel should be hired to publicize all of our CIS programs to local industry and high schools	$15,000	Community responsiveness
2.	Hire one new full-time faculty within one year, and two within two years to replace faculty planning to retire	$64,547 to $120,380 plus benefits per employee	Institutional effectiveness
3.	Based on the results of our student surveys we should maintain a 3-year upgrade cycle on hardware to keep up with industry standards	$850,000	Modernization
4.	Events such as Cloud Day, Cybersecurity Day, CIS Career Day, and the Technology Fair should be held regularly at least once a year (ideally once a semester)	$10,000	Student success and support
5.	Work with our advisory board and other industry partners to develop internship opportunities	$0	Collaboration
6.	Move into emerging areas, and to strengthen our current programs to make them more robust	$0	Student learning
7.	Have CIS faculty spend at least part of one lecture in each CIS 13 class discussing various programs offered by the CIS department	$0	Student success and support
8.	Provide training to faculty on new technologies	$10,000	Institutional effectiveness
9.	Make skilled lab aides available in classes and open labs	$82,000	Student success and support
10.	Use standardized tests in CIS classes that have multiple sections so that the evaluation process has more consistency	$0	Student learning

B) Explain why the list is prioritized in this way.

In order to keep our programs of optimal value to our students, the most important things are to have the necessary resources (skilled faculty, current hardware and software) available, curriculum on in-demand technologies, and marketing our programs so that our students are aware of their existence and worth.

Appendix A
ALIGNMENT GRIDS

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

Program: **Computer Information Systems**	**Number of Courses:** 21	**Date Updated:** 5/31/2019	**Submitted by:**

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				
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 119 Introduction to Computer Security: SLO #1 Demonstrate the knowledge necessary to create a secure computer environment.			X				
CIS 119 Introduction to Computer Security: SLO #2 Apply the concepts of cybersecurity and the regulatory standards and compliances to a computer installation.	X		X				
CIS 119 Introduction to Computer Security: SLO #3 Define Firewall and intrusion detection and identify the needed countermeasures.			X				
CIS 119 Introduction to Computer Security: SLO #4 Demonstrate an understanding of the processes and goals of Computer security		X					
CIS 120 Computer Forensics: SLO #1 Understand the role of the cybersecurity forensics investigator, and the concepts and terminology used in computer forensics.	X						
CIS 120 Computer Forensics: SLO #2 Demonstrate the ability to use forensics tools to gather and analyze data on a compromised computer system.			X				
CIS 120 Computer Forensics: SLO #3 Demonstrate the ability to conduct a forensics investigation.			X				
CIS 120 Computer Forensics: SLO #4 Understand the complexities involved in conducting forensics investigations on various devices and in the cloud.	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 121 Cybersecurity Programming: SLO #1 Understanding the techniques used by hackers to crack an organization's Internet perimeter and chain exploits to gain deeper access to an organization's resources.		X	X				
CIS 121 Cybersecurity Programming: SLO #2 Demonstrate the ability to write script using the Python programming language.			X				
CIS 121 Cybersecurity Programming: SLO #3 Demonstrate the ability to create and execute penetration tests, report results.			X				
CIS 122 Ethical Hacking: SLO #1 Identify and analyze the steps an ethical hacker would take in order to compromise a target system.			X				
CIS 122 Ethical Hacking: SLO #2 Identify the tools and techniques used to carry out a penetration testing.			X				
CIS 122 Ethical Hacking: SLO #3 Assess potential vulnerabilities in a network security system within executable programs or within network protocols.			X				
CIS 122 Ethical Hacking: SLO #4 Understand the basic techniques for gaining unauthorized access into a network and computer system using both technical and non-technical means.			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				
CIS 13 Computer Information Systems: SLO #4 Networking Demonstrate knowledge of network configurations, risk management and security protocols.			X				
CIS 132 Web Development using HTML5, CSS3, and WordPress: SLO #1 Demonstrate the ability to plan, design, develop, test, and publish a website developed in HTML5, CSS3, and WordPress.			X				
CIS 132 Web Development using HTML5, CSS3, and WordPress: SLO #2 Understand how to incorporate usability and accessibility features in a website.			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 132 Web Development using HTML5, CSS3, and WordPress: SLO #3 Understand the components and steps required to publish a website on the internet.		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 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				
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 ASP.NET and C# programming language usage.			X				
CIS 134 ASP.NET with C# Business Web Programming: SLO #3 Website Planning Demonstrate project design of a complete website including the creation of a requirements document, database and class diagrams, flowcharts, site maps, and UIX designs.		X	X				
CIS 136 Building Mobile Apps: SLO #1 Understanding Mobile Frameworks Students will understand the different types of application frameworks used to develop mobile applications.			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 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				
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				
CIS 137 Computer Networking Fundamentals: SLO #1 Students will be able to determine personal computer and network configurations to propose solutions to solve communication and data needs of an organization.			X				
CIS 137 Computer Networking Fundamentals: SLO #2 Students will be able to plan, document, configure and secure a personal computer and a simple network using routers, switches, and other appropriate hardware and software.		X	X				
CIS 137 Computer Networking Fundamentals: SLO #3 Students will be able to troubleshoot all aspects of computer problems including hardware, software, storage and security issues by using troubleshooting methodology and utilities.			X				
CIS 137 Computer Networking Fundamentals: SLO #4 Students will be able to differentiate between static and dynamic IP addresses and assign a static IP address, subnet mask, and default gateway to devices on a network.			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 Introduction to Networks CISCO 1: SLO #1 Data Communication Terms Describe and explain data communication terms such as broadband and baseband communications.		X					
CIS 140 Introduction to Networks CISCO 1: SLO #2 Modulation Techniques Describe and use different modulation techniques such as time-division and frequency division.		X					
CIS 140 Introduction to Networks 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 Introduction to Networks 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						
CIS 140 Introduction to Networks 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 Introduction to Networks CISCO 1: SLO #6 Ethical Considerations Identify ethical considerations such as privacy, hacking, and piracy.	X						
CIS 141 Routing and Switching Essentials 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 Routing and Switching Essentials CISCO 2: SLO #2 Basic Methods Define flow control and describe the three basic methods used in connection-oriented networking.		X					
CIS 141 Routing and Switching Essentials CISCO 2: SLO #3 Functions of the TCP/IP Identify the functions of the TCP/IP transport-layer protocols.		X					
CIS 141 Routing and Switching Essentials CISCO 2: SLO #4 Comparing Protocols Compare TCP/IP protocols to the ISO reference model layer four.		X	X				
CIS 141 Routing and Switching Essentials CISCO 2: SLO #5 ICMP Functions Identify the functions performed by ICMP.		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 141 Routing and Switching Essentials 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				

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 142 Scaling Networks 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 142 142 Scaling Networks 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 142 142 Scaling Networks CISCO 3: SLO #3 Router Design of LANs and WANs Install and configure routers for design of LANs and WANs.		X					
CIS 142 142 Scaling Networks 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					
CIS 142 142 Scaling Networks 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 142 142 Scaling Networks CISCO 3: SLO #6 New Version of CISCO Download and install a new version of the CISCO Internetworking Operating system software.		X					
CIS 143 Connecting Networks CISCO 4: SLO #1 Internet Working Modules Define and discuss internetworking models. Determine appropriate paths for internetworking.		X					
CIS 143 Connecting Networks CISCO 4: SLO #2 User Interfaces Install user interfaces.		X					
CIS 143 Connecting Networks CISCO 4: SLO #3 Router Issues List basic router issues. Describe serial connections for wide area networking. Auto install router configurations.		X					
CIS 143 Connecting Networks CISCO 4: SLO #4 Configuring Routers Configure hardware and software for routers to use both LAN and WAN protocols.		X					
CIS 143 Connecting Networks 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 150 Introduction to Cloud Computing with AWS: SLO #1 Cloud Computing Concepts Demonstrate an understanding of cloud computing and its advantages and disadvantages.	X						
CIS 150 Introduction to Cloud Computing with AWS: SLO #2 Cloud Computing Models Describe the different cloud computing models and its implementation in Amazon Web Services (AWS).			X				
CIS 150 Introduction to Cloud Computing with AWS: SLO #3 Cloud Applications Create a cloud application utilizing AWS Computing Services.			X				
CIS 152 Data Storage Systems with AWS: SLO #1 Cloud Database Concepts Explain the differences between file-based, hierarchical, network, relational, and object-oriented databases and the database design principles that leverage cloud computing technology.			X				
CIS 152 Data Storage Systems with AWS: SLO #2 Database Design and Management Demonstrate the ability to design and manage databases in AWS.		X					
CIS 152 Data Storage Systems with AWS: SLO #3 AWS Data Storage Management Demonstrate the management of block-level and object-level data storage in AWS.			X				
CIS 154 Compute Engines with AWS: SLO #1 Global Infrastructure Students will be able to demonstrate an understanding of the AWS Global Infrastructure.							
CIS 154 Compute Engines with AWS: SLO #2 AWS Compute Services Students will be able to set up, configure, and manage a compute engine with AWS and implement load balancing and scaling functionality.			X				
CIS 154 Compute Engines with AWS: SLO #3 Serverless Applications Students will be able to create an application using the AWS serverless compute model.			X				
CIS 156 AWS Security: SLO #1 AWS App Security Requirements Students will identify important security principles that AWS applications must meet when deployed.			X				
CIS 156 AWS Security: SLO #2 AWS Global Infrastructure and Shared Responsibility Students will understand the AWS Global Infrastructure Security and the Shared Responsibility Model.		X					
CIS 156 AWS Security: SLO #3 AWS Public and Private Subnets Students understand how to implement private and public subnets for an AWS infrastructure.			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 156 AWS Security: SLO #4 AWS Firewall Students will understand how to implement a firewall to protect AWS assets.			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						
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				
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, Social Media 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, Social Media and Web: SLO #2 Security Analyze the features of a secure website and create secure browser settings.			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 19 Internet, Social Media 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, Social Media and Web: SLO #4 Fraud Demonstrate an understanding of fraud and identity theft and its counter measures.		X	X				
CIS 2 Office Applications: SLO #1 Basic Windows Operations Students will be able to utilize the Windows operating system and file management tool to manage files, folders and storage media.		X	X	X			X
CIS 2 Office Applications: SLO # 2 Introduction to Word processing Students will be able to create, save, copy, modify and format a word processing document. Students will also be able to create documents using advanced features of Word such as mail merge, document collaboration and multipage reports.		X	X	X	X		X
CIS 2 Office Applications: SLO #3 Basic Spreadsheet, Database, and Presentation Development Students will be able to create, save, copy, modify and format a spreadsheet worksheet, create formulas and charts, create and use a database, and design presentation slides.		X	X	X	X		X
CIS 2 Office Applications: SLO #4 Basic Email and Contact Management Students will be able to send/receive email, schedule calendar events, manage tasks, manage contacts, take notes and create a journal.		X	X	X	X		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 exclude 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				

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 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				
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				
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				
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 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				
CIS 30 Introduction to eCommerce: SLO #3 Software Understand the basic and advanced functions of eCommerce software.		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 40 Personal Computer Support and Networking: SLO #1 Terminology Examine operating systems terminology and technologies as they apply to microcomputers.		X					
CIS 40 Personal Computer Support and Networking: 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				
CIS 40 Personal Computer Support and Networking: 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 Database Programming: SLO #1 Tables and Relationships Design and develop tables and relationships for common business problems.			X				
CIS 80 Database Programming: SLO #2 Solving Common Business Problems Solve common business-oriented problems by using SQL programming language to access database for answers to common business queries.		X	X	X	X		X
CIS 80 Database Programming: SLO #3 Conditional Statements Develop conditional statements and multiple level "if" statements to query database tables.			X				
CIS 80 Database Programming: SLO #4 Program Code Write programming code to manipulate database tables.			X				
CIS 80 Database Programming: SLO #5 Efficient Programming Techniques Demonstrate use of efficient programming techniques.			X	X	X		X
CIS 84 MySQL Database Programming for the Web: SLO #1 Designing and Developing a MySQL database given a set of requirements Students will be able to design and develop a MySQL database.			X				
CIS 84 MySQL Database Programming for the Web: SLO #2 Students will be able to incorporate a MySQL in server-side website processing.			X				
CIS 84 MySQL Database Programming for the Web: SLO #3 Students will be able to identify web server requirements, configure a server, and deploy a MySQL database and website to a web server.		X	X				

Appendix B
SLO/PLO TIMELINES

SLO Timeline *Worksheet*
(2017 – 2022)

Division: Business (CIS)

Program: COMPUTER INFORMATION SYSTEMS
Program Review Date:

Directions: *Type an **X** in the cells below to indicate the semester in which the SLOs/PLOs are being assessed. The completed worksheet should be emailed to the division facilitator by* ***JUNE 1, 2017*** *. Facilitators are responsible for making sure the information is complete and e-mailing an electronic copy of this Timeline Worksheet document (in Word or PDF format) to ipena@elcamino.edu by _____. Once received by the SLO Administrative Assistant, this information will be input into TracDat.*

Course and SLO #	Note if offered only in FA/SP	SP 2017	FA 2017	SP 2018	FA 2018	SP 2019	FA 2019	SP 2020	FA 2020	SP 2021	FA 2021	SP 2022	FA 2022
PLO #1					X						X		
PLO #2							X						X
PLO #3		X							X				
CIS 11 - SLO #1	**FA**		X										
CIS 11 - SLO #2					X								
CIS 11 - SLO #3							X						
CIS 11 - SLO #4									X				
CIS 11 - SLO #5							X						
CIS 11 - SLO #6									X				
CIS 119 - SLO #1			X		X								
CIS 119 - SLO #2			X				X						
CIS 119 - SLO #3			X						X				
CIS 119 - SLO #4			X										
CIS 120 - SLO #1							X						
CIS 120 - SLO #2									X				
CIS 120 - SLO #3											X		
CIS 120 - SLO #4													X
CIS 121 - SLO #1								X					

Course and SLO #	Note if offered only in FA/SP	SP 2017	FA 2017	SP 2018	FA 2018	SP 2019	FA 2019	SP 2020	FA 2020	SP 2021	FA 2021	SP 2022	FA 2022
CIS 121 - SLO #2										X			
CIS 121 - SLO #3												X	
CIS 122 - SLO #1					X				X				
CIS 122 - SLO #2					X				X				
CIS 122 - SLO #3					X				X				
CIS 122 - SLO #4					X				X				
CIS 13 - SLO #1		X		X		X		X					
CIS 13 - SLO #2		X	X		X		X		X				
CIS 13 - SLO #3		X	X		X		X		X				
CIS 13 - SLO #4		X	X		X		X		X				
CIS 133 - SLO #1	FA		X						X				
CIS 133 - SLO #2					X								
CIS 133 - SLO #3							X						
CIS 134 - SLO #1	SP	X						X					
CIS 134 - SLO #2				X									
CIS 134 - SLO #3						X							
CIS 136 - SLO #1	SP	X											
CIS 136 - SLO #2				X									
CIS 136 - SLO #3						X							
CIS 136 - SLO #4								X					
CIS 140 - SLO #1		X							X				
CIS 140 - SLO #2		X											
CIS 140 - SLO #3			X										
CIS 140 - SLO #4					X								
CIS 140 - SLO #5							X						
CIS 140 - SLO #6			X										
CIS 141 - SLO #1					X								
CIS 141 - SLO #2			X										
CIS 141 - SLO #3			X										
CIS 141 - SLO #4							X						
CIS 141 - SLO #5									X				
CIS 141 - SLO #6		X											
CIS 142 - SLO #1	SP					X							

Course and SLO #	Note if offered only in FA/SP	SP 2017	FA 2017	SP 2018	FA 2018	SP 2019	FA 2019	SP 2020	FA 2020	SP 2021	FA 2021	SP 2022	FA 2022
CIS 142 - SLO #2				X									
CIS 142 - SLO #3				X									
CIS 142 - SLO #4								X					
CIS 142 - SLO #5								X					
CIS 142 - SLO #6						X							

Course and SLO #	Note if offered only in FA/SP	SP 2017	FA 2017	SP 2018	FA 2018	SP 2019	FA 2019	SP 2020	FA 2020	SP 2021	FA 2021	SP 2022	FA 2022
CIS 143 - SLO #1	**SP**							**X**					
CIS 143 - SLO #2													
CIS 143 - SLO #3													
CIS 143 - SLO #4				**X**									
CIS 143 - SLO #5						**X**							
CIS 150 - SLO #1							**X**						
CIS 150 - SLO #2									**X**				
CIS 150 - SLO #3											**X**		
CIS 152 - SLO #1								**X**					
CIS 152 - SLO #2										**X**			
CIS 152 - SLO #3												**X**	
CIS 154 - SLO #1							**X**						
CIS 154 - SLO #2									**X**				
CIS 154 - SLO #3											**X**		
CIS 156 - SLO #1								**X**					
CIS 156 - SLO #2										**X**			
CIS 156 - SLO #3												**X**	
CIS 156 - SLO #4													
CIS 16 - SLO #1	**FA**								**X**				
CIS 16 - SLO #2			**X**										
CIS 16 - SLO #3					**X**								
CIS 16 - SLO #4							**X**						
CIS 18 - SLO #1	**SP**					**X**							
CIS 18 - SLO #2				**X**									
CIS 18 - SLO #3		**X**						**X**					
CIS 19 - SLO #1	**FA**						**X**						
CIS 19 - SLO #2					**X**								
CIS 19 - SLO #3			**X**						**X**				
CIS 2 - SLO #1		**X**											
CIS 2 - SLO #2				**X**									
CIS 2 - SLO #3						**X**							
CIS 2 - SLO #4								**X**					
CIS 26 - SLO #1							**X**						
CIS 26 - SLO #2						**X**							
CIS 26 - SLO #3					**X**								

Course and SLO #	Note if offered only in FA/SP	SP 2017	FA 2017	SP 2018	FA 2018	SP 2019	FA 2019	SP 2020	FA 2020	SP 2021	FA 2021	SP 2022	FA 2022
CIS 26 - SLO #4				X									
CIS 26 - SLO #5			X						X				
CIS 26 - SLO #6		X						X					
CIS 28 - SLO #1							X						
CIS 28 - SLO #2					X								
CIS 28 - SLO #3									X				
CIS 28 - SLO #4			X										
CIS 29 - SLO #1	SP		X		X								
CIS 29 - SLO #2			X				X						
CIS 29 - SLO #3			X										
CIS 29 - SLO #4			X						X				
CIS 29 - SLO #5			X										
CIS 30 - SLO #1					X								
CIS 30 - SLO #2			X						X				
CIS 30 - SLO #3							X						
CIS 40 - SLO #1			X						X				
CIS 40 - SLO #2					X								
CIS 40 - SLO #3							X						
CIS 80 - SLO #1				X		X		X					
CIS 80 - SLO #2				X		X				X			
CIS 80 - SLO #3				X		X						X	
CIS 80 - SLO #4				X		X							
CIS 80 - SLO #5				X		X							
CIS 84 - SLO #1													
CIS 84 - SLO #2													
CIS 84 - SLO #3													

Appendix C
CURRICULUM COURSE REVIEW TIMELINE

COURSE	CTE	ACTIVE	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
CIS 11	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 119	Y	Y	NEW		2 YR	X		2 YR		2 YR		2 YR		2 YR	
CIS 120	Y	Y				X		2 YR		2 YR		2 YR		2 YR	
CIS 121	Y	Y				NEW		2 YR		2 YR		2 YR		2 YR	
CIS 122	Y	Y		NEW	X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 13	Y	Y		X		X		2 YR		2 YR		2 YR		2 YR	
CIS 132	Y	Y			NEW		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 133	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 134	Y	Y	2 YR	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 136	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 137	Y	Y			NEW		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 140	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 141	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 142	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 143	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 150	Y	Y				NEW		2 YR		2 YR		2 YR		2 YR	
CIS 152	Y	Y				NEW		2 YR		2 YR		2 YR		2 YR	
CIS 154	Y	Y				NEW		2 YR		2 YR		2 YR		2 YR	
CIS 156	Y	Y				NEW		2 YR		2 YR		2 YR		2 YR	
CIS 16	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 18	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 19	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 2	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 26	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 28	Y	Y	X		X		2 YR		2 YR		2 YR		2 YR		2 YR
CIS 29	Y	Y	X	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 30	Y	Y		X		X		2 YR		2 YR		2 YR		2 YR	
CIS 40	Y	Y	2 YR	X		X		2 YR		2 YR		2 YR		2 YR	
CIS 80	Y	Y	X		X	X		2 YR		2 YR		2 YR		2 YR	
CIS 84	Y	Y			NEW		2YR		2 YR		2 YR		2 YR		2 YR
CIS 95 (formerly 95/96abcd)	Y	Y	X					CCC Chair							
CIS 99 (formerly 99abc)	Y	Y					CCC Chair								

APPENDIX D
CAREER AND TECHNICAL EDUCATION (CTE) SUPPLEMENTAL QUESTIONS

CTE programs must conduct a full program review every 4 years. The comprehensive program review includes responses to the CTE supplemental questions below. Every two years (once between full program reviews) these supplemental questions must be answered and submitted to Academic Affairs for posting on the College website.

Use labor market data, advisory committee input/feedback, and institutional and program-level data to respond to the following questions:

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

1. **How strong is the occupational demand for the program?** In your response, describe any changes in demand over the past 5 years and discuss the occupational outlook for next 5 years. Provide applicable labor market data (e.g., US Bureau of Labor Statistics, Employment Development Department) that address state and local needs.

Data for this question were taken from the following sources:
https://www.labormarketinfo.edd.ca.gov/geography/md/los-angeles-long-beach-glendale.html
https://www.labormarketinfo.edd.ca.gov/geography/california-statewide.html

and include the following SOC codes:

	SOC Codes
Computer and Information Systems Managers	11-3021
Computer systems analysis	15-1121
Information security analysts	15-1122
Software developers, applications	15-1132
Software developers, systems software	15-1133
Website design and development	15-1134
Database design and administration	15-1141
Network and computer systems administrators	15-1142

Computer network architects	15-1143
Computer support; provide technical assistance to systems users	15-1151
Computer network support specialists	15-1152
Other information technology; includes all emerging technologies	15-1199

The data below indicates that there has been, and will continue to be steady growth in the local metropolitan area for the ten occupational codes listed. Of special note is the projected growth in Web developers (36.0%), computer systems analysts (23.6%), and application software developers (22.9%).

Of the ten occupations listed, the data that compares our local metropolitan area to the state of California is not as consistent. Although there is positive growth indicated in all occupations, the change in demand for five of them is greater than that of the state of California as a whole, and the demand for the other five is less. This does not indicate that the demand in our metropolitan area is weak, but that demand in other areas like San Jose – Sunnyvale – Santa Clara (Silicon Valley) skew the comparisons.

		Los Angeles, Long Beach, Glendale			State of California		
		2014	2024		2014	2024	
113021	Computer and Information Systems Managers	8,690	10,120	16.5%	53,000	62,400	17.7%
151121	Computer Systems Analysts	12,690	15,690	23.6%	79,200	88,600	11.9%
151122	Information Security Analysts	1,990	2,150	8.0%	8,100	10,400	28.4%
151132	Software Developers, Applications	14,780	18,170	22.9%	134,200	188,000	40.1%
151133	Software Developers, Systems Software	10,660	12,240	14.8%	93,200	105,500	13.2%
151134	Web Developers	6,020	8,190	36.0%	27,800	33,700	21.2%
151141	Database Administrators	2,540	2,900	14.2%	12,600	14,800	17.5%
151142	Network And Computer Systems Administrators	10,170	11,370	11.8%	43,400	47,400	9.2%
151151	Computer User Support Specialists	15,180	17,780	17.1%	70,300	81,600	16.1%
151152	Computer Network Support Specialists	4,510	4,980	10.4%	20,100	22,500	11.9%

2. How does the program address needs that are not met by similar programs in the region? In your response, identify any distinctive components of the program (e.g., curriculum, facilities, and resources) and/or describe any unique contributions the program or its students/graduates make to the community served.

The table below (source; http://nces.ed.gov/collegenavigator/) lists all of the colleges (community and four year) within a twenty mile radius of El Camino College. Every one of these institutions offers Associates Degrees, as well as certificates in information technology, and draws its students based primarily on geographic distance from the student's home or work location.

	Miles From El Camino
El Camino College	**0.0**
Los Angeles Southwest College	**5.1**
El Camino College - Compton Center	**7.3**
Los Angeles Harbor College	**7.9**
West Los Angeles College	**8.5**
Santa Monica College	**11.7**
Long Beach City College	**13.7**
Los Angeles City College	**14.3**
Cerritos College	**14.4**
East Los Angeles College	**15.5**
Cypress College	**17.5**
Rio Hondo College	**18.8**

El Camino College is located within a major metropolitan area where IT skills are in demand. As expected, every institution listed above also offers variations on many of the same programs/courses we offer.

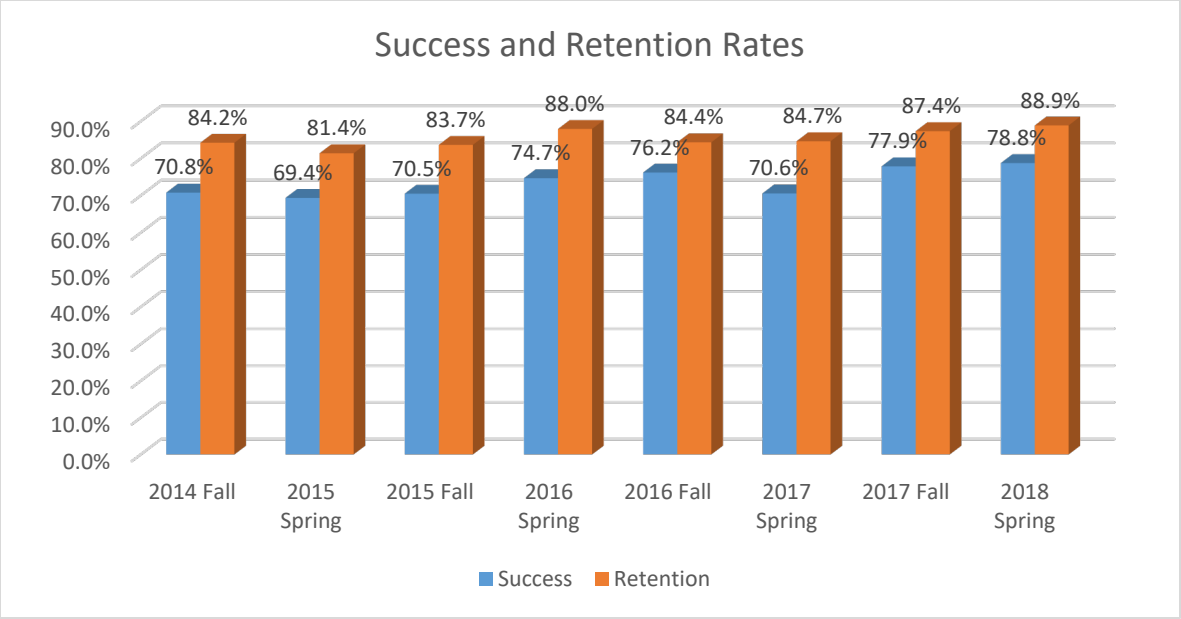
Currently however, there are certain newer technologies like Cybersecurity and Amazon Web Services (AWS) that, in addition to El Camino College, are only being offered by West Los Angeles College, Santa Monica College, Long Beach City College and East Los Angeles College as well. As demand grows, it is expected that many of the other colleges will also add them to their curriculum.

3. **What are the completion, success, and employment rates for students in the program?** In your response, identify the standards set by the program and discuss any factors that may impact completion, success, and employment rates among students in the program. Describe the status of any action plans for maintaining/improving rates relative to such benchmarks.

Success and Completion

The minimum semester success and completion rates that the CIS Department strives for are 70% and 80% respectively.

The chart below displays those rates for the eight semesters since the last full Program Review.



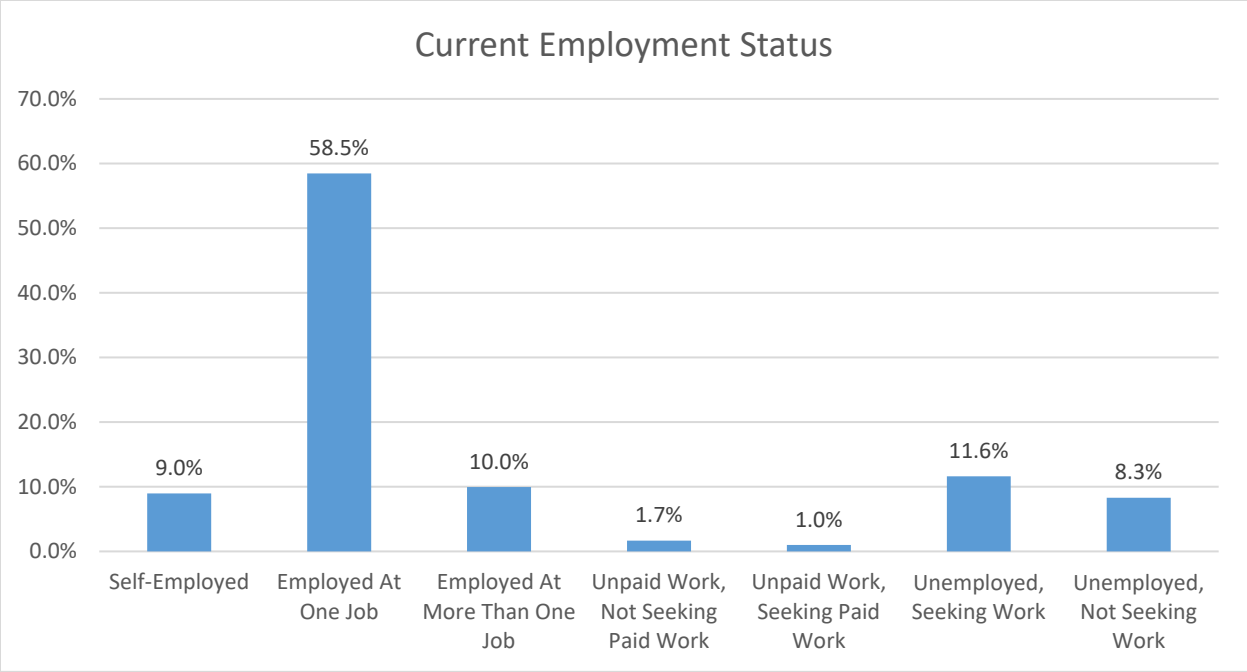
The data shows:

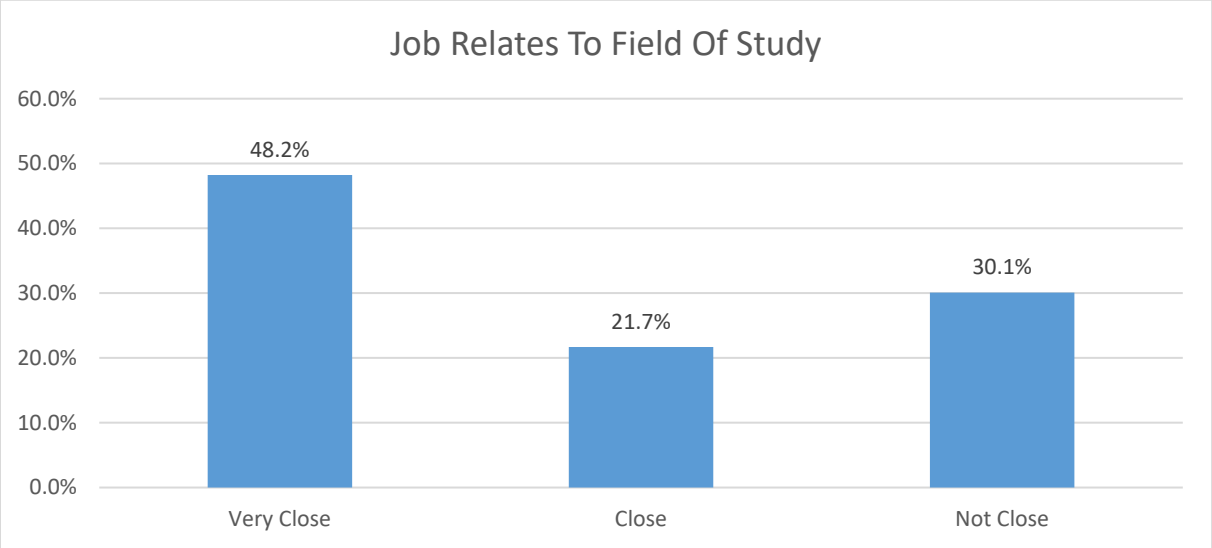
a) A fairly consistent success rate averaging 73.6% (high = 78.8% low = 69.4%)
b) An equally consistent retention rate averaging 85.3% (high = 88.9% low = 81.4%)

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 the latest El Camino College Technical Education (CTE) Employment Outcomes Survey, 77.4% of all respondents are employed for pay, and almost 70% of current job respondents stated that after completing their program at El Camino College their job is closely, or very closely related to their field of study.





4. **List any licensure/certification exam(s) required for entry into the workforce in the field of study and report the most recent pass rate(s) among program graduates.** In your response, identify any applicable performance benchmarks set by regulatory agencies and describe the status of any action plans for maintaining/improving pass rates relative to such benchmarks.

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

   Although not required for career entry, there are 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.

Additionally, there is a Cybersecurity exam offered by CompTIA as well as AWS certification exams.

5. Are the students satisfied with their preparation for employment? Are the employers in the field satisfied with the level of preparation of program graduates? Use data from student surveys, employer surveys, and other sources of employment feedback to justify your response.

The results of the most recent CTE Employment Outcomes Survey of those CTE students responding show that:

- 55% of former students were "very satisfied" with the education and training they received at El Camino College, and 34% were "satisfied" for an overall satisfaction rate of 89%.
- The average hourly wage for all respondents increased by 18% once they completed a CTE program at El Camino College.
- 54.6% reported that their CTE training resulted in a promotion at the same or new company, enabled them to start their own business, or prepared them for a possible new job.
- 48.2% indicated they are working in the same field as their studies and training, followed by 21.7% indicating they work in a field that is "close" to their studies and training,
- Of those respondents who engaged in a job search after finishing their studies, 79% reported finding a job. Of those with a successful job search, 79.8% found a job within six months (57.3% within three months).
- Before their studies, 55.4% of respondents worked full time. After completing their studies, 64.3% work full time.

The conclusions from the CTE Employment Outcomes Survey states that "El Camino College supported the educational goals of students in various CTE programs. Respondents were satisfied with the education and training received from El Camino College. Respondents achieved their goals of either completing a program, earning transfer units, or transferring (mainly to a four-year university)".

6. Is the advisory committee satisfied with the level of preparation of program graduates? How has advisory committee input and feedback been used in the past two years to ensure employer needs are met by the program? Describe the status and impact of any advisory committee recommendations.

The CIS Department meets annually with our Advisory Board so that we can obtain their input on current trends in information technology, the skills, courses and certificates local employers are looking for in potential new-hires, and the progress the CIS Department has made on their suggestions from the past year.

Each year the Advisory Board has stated their approval, and indicated that they have been impressed with the progress we have made. The Advisory Board is pleased to know that their input has resulted in the introduction of new courses, certificates and degrees and modifications to existing ones.

California Education Code 78016 requires that the review process for CTE programs includes the

review and comments of a program's advisory committee. **Provide the following information:**

a. Our most recent advisory committee membership list and credentials.

- Kevin Laird, Director, Toyota Financial Services
- Jorge Mata, CIO LACCD
- Fouad Jilani, IT Director, Wedgewood Inc.
- Steve Lantz, Director, IT Infrastructure & Operations, Torrance Memorial Medical Center
- Debbie Goldwater, Director, IT Architecture and Security, UCLA
- Sandy Coffey, Director of Enterprise Architecture, Farmers Insurance

b. 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 15 2016 9:00 AM

Location: MBA 304

Attendees:

- Kevin Laird, Director, Toyota Financial Services
- Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
- Jorge Mata, CIO LACCD
- Fouad Jilani, IT Director, Wedgewood Inc.
- Steve Lantz, Director, IT Infrastructure & Operations, Torrance Memorial Medical Center
- Dr. Pat Vacca, CIS faculty
- Randy Harris, CIS faculty
- Dr. Jay Siddiqui, CIS faculty
- John Mufich, Business faculty
- Richard Perkins, CIS Adjunct faculty
- Mohammad Khalilzadeh, CIS faculty (Compton)
- Monica Chaban, CIS faculty

The meeting began at 9AM with Dr. Pat Vacca welcoming and thanking everyone for their participation. Dr. Virginia Rapp could not be present due to an unexpected meeting conflict. Dr. Vacca emphasized that the goal of the meeting was to gain industry input regarding the direction of technology, and courses of study that the department should explore. The student body is comprised of individuals seeking various goals: transfer to a 4 year school, gaining employment after 2 years of study and an A.S. Degree, and retraining. After a round of introductions, the agenda and materials packet were described.

Accomplishments A review was then given by various faculty on courses and certificates that have been developed, based on the board's recommendations at last year's meeting. CIS faculty have completed development of several certificates - the Business Programming Certificate of Achievement which is awaiting Chancellors approval, and the Business Information Worker and CISCO Certificates of Achievement which are pending LAOCRC approval. At the course level, faculty completed revisions to the Database Programming course (CIS 80) to have a more generic focus on the SQL programming language, modernization of the Advanced Database Applications course (CIS 29), to include big data, data mining, and data analytics, and lastly, a new course in Computer Security and Forensics (CIS 119). The courses have been approved by the College Curriculum Committee and are pending Chancellors Office approval. A cybersecurity training program for educators was presented in the prior week as a collaboration effort between El Camino College, Pasadena College, and Glendale College.

The board was impressed with the progress that had been made given their understanding of the steps in the curriculum process.

Curriculum in Development The focus then shifted to curriculum that is currently in development.

Project Management Fundamentals Course (BUS 73)

Originally these were targeted to be 2 courses, one in theory offered in the Business Management department, and one focusing on Project Management software offered in CIS. However, these were merged into one 4-unit course, which the student could complete in one semester. The board agreed that it was a better approach and that more students were likely to enroll in the course having both theory and hands-on experience.

Personal Computer Support and Networking Course (CIS 40)
At last year's board meeting, the board felt this course should be expanded to include not only general PC maintenance, but setting up small networks (LAN's), data backups, security, and a telecom component. In current review, the board proposed including mobile support as a topic, as more and more companies are leaning toward mobile hardware and software, the latest tablets, and relevant gadgets. They also proposed integrating cloud services and virtualization, and concluded that this is a course that will change frequently and should be re-evaluated every year.

Proposed Database Management Certificate
The components of the Database Management Certificate were reviewed and agreed upon by all.

Proposed Computer User Support Specialist certificate
The components of the Computer User Support Certificate were reviewed and agreed upon by all.

Curriculum in Discussion

As discussion ensued, the board felt that the new course in Computer Security and Forensics (CIS 119) should be included in the CISCO networking program, and room be made for it by removing CIS 28 and CIS134. They also felt it should be a required course in the A.S. Degree and any future certificates dealing with computer support (Small Business Technical Support).

A.S. Degree
The degree underwent major scrutiny and many changes were recommended:
- Remove CIS 18 as required courses
- Modify CIS 19 (see below)
- Add in CIS 119 as a required course
- Remove GROUP B as an option (CIS 140 and CIS 141)

- Include GROUP A courses as required courses (CIS 26 and CIS 28) – this requires further review in all degree tracks and certificates (see below)
- Include in Track A (Help Desk) BUS 28
- Rename Track B to Database and add in CIS18
- Include in Track C (Networking) CIS 140 and CIS 141
- Include in Track D (Programming) CIS 18 and CIS 80
- Include in Track E (Mobile and Web Programming) CIS 18

Given these recommendations, all certificates should be compared against these track revisions

for accuracy.

Project Management Certificate
A proposal to develop a Project Management certificate with the goal of a student gaining PMI certification was discussed. Courses relevant to the certificate were discussed and the following "short list" suggested: BUS 73, CIS13, BUS 20, 28, 29, BIS 1A or 11. It was proposed to include an additional "PMI-related course, or modification to an existing course to introduce that material, and prepare students to take the exam. This will be examined further by Business faculty.

CyberDefense Certificate
The board heartily agreed to the certificate and suggested that CIS 40 be added to it, as well as another technical course dealing with cybersecurity, intrusion and/or defense. Ethical hacking was discussed as an option, and CIS faculty will explore that further.

Small Business Technical Support Certificate/ Business Information Worker Pathways II
The LAOCRC has proposed several Pathways which could crossover into certificates being developed. There could also be overlap with the Computer User Support specialist certificate. This is on hold pending further research.

Health Information/Medical Records
A lively and exhilarating conversation ensued and health technology is going to be a booming career field. It's an area CIS should get into quickly, in joint partnership with the other departments on campus, like Nursing. CIS could offer instruction in the popular software used by major facilities (Epic, Cerner, MyChart), and Electronic Medical Record Keeping, perhaps creating a certificate named Information Technology and Medical Record Keeping. A liaison could be made with these software giants to have ECC certify instructors, as they most probably want to sell their products and would welcome training programs.

Our own nursing students would benefit and have a more competitive chance of being hired, knowing how to use this software and requiring no further training to get up to speed in the workforce. Professor Mufich will identify the next steps to be taken.

Social Media/Marketing
Everyone agreed this element was missing a vital part of today's internet community. Upon examination of CIS 19 – it was proposed that the course be modified to include Social Media and remove the security component, as security is covered in CIS 119, and to a lesser extent, CIS 40. Professor Siddiqui will implement the modifications to CIS 19.

HTML5/CSS3 and Content Management Systems
The fundamental building blocks of the web content are HTML5 and CSS3, and more and more companies are using content management systems like SharePoint and WordPress. The board suggested we look into offering this popular curriculum somewhere but understands that adding another course would possibly impact a student completing a certificate or degree in 2-year timeframe.

Microsoft Server Administration/OS Installation/Desktop Support (Business Information Worker Pathways III)

This is a newly developed pathway, but the CIS department does not offer courses that match this pathway. It should continue to be examined as CIS technology changes.

Programming Languages in new areas
The board felt that the major programming languages are fairly solid. But rapidly changing trends in the mobile and wearable tech areas, are introducing new languages, and SDKS. Apple introduced a new language, Swift, which is rapidly gaining popularity and may positively influence Apples share of the mobile marketplace. It was suggested that the new languages be explored to determine if they can be incorporated into existing courses, or developed into new courses.

Marketing
We are building awesome curriculum! So, what are the ideas on the best way to market our courses?
 Mentorship Program
 Business EXPO
 Hit up HR people to share training options for their employees
 Have “High School Day” connecting seniors with employers at our school
 Show off college student’s work
 Have graduate come back Phone calls with industry
 Create our own social network
 Lead up to internships

All excellent ideas which must be funded and prioritized.

This was an excellent meeting with a lot of exciting new ideas. The board was thanked for their time and contribution. The meeting adjourned at 11:30AM.

Department of Computer Information Systems (CIS)

Advisory Board Meeting

Date: May 19, 2017 9:00 AM

Location: MBA 304

Attendees:

- Kevin Laird, Director, Toyota Financial Services
- Elliott Stern, Owner, Maestro Computers Small Business Networking and Support
- Debbie Goldwater, Director, IT Architecture and Security, UCLA
- Jorge Mata, CIO LACCD
- Fouad Jilani, Director, IT, Wedgewood Inc.
- Steve Lantz, Director, IT Infrastructure & Operations, Torrance Memorial Medical Center
- Ken Sims, VP Cybersecurity, Smart Utility Systems
- Dr. Virginia Rapp, Dean, Business Division
- Dr. Pat Vacca, CIS faculty
- Randy Harris, CIS faculty
- Dr. Jay Siddiqui, CIS faculty
- Richard Perkins, CIS faculty
- Monica Chaban, CIS faculty

The meeting began at 9AM with Dr. Pat Vacca welcoming and thanking everyone for their participation in this commemorative 5th year meeting of the Advisory Board. After introductions, the agenda and materials packet were described. The first general topic focused on the challenges of marketing our programs. A main challenge is getting enrollment, in that economy drives enrollment. When the economy is good, enrollment is down. The costs to students not only for enrollment, but especially for books was discussed as well as measures being taken statewide to reduce costs. Everyone agreed that community colleges are challenged to attract students, and that good marketing is the key. We need to invest in ourselves in order to grow, and just like big business, at times we are asked to make cuts in order to grow. Social media as a form of marketing was proposed. Dr. Rapp explained that the college has an over-arching social media presence, and our division hooks into it; divisions do not have their own presence at this time. CTEA (CARL D. PERKINS CAREER AND TECHNICAL EDUCATION IMPROVEMENT ACT) grant money can be used as funding for marketing purposes.

<u>Accomplishments</u>

A review of the curriculum progress made in the past year was discussed. Several new certificates were developed as well as changes to courses, and the addition of new courses. Based on the board's recommendations at last year's meeting, CIS faculty have completed development of several certificates, all of which were either approved by the Chancellors office, or are in queue pending approval. The Business Programming and Business Information Worker Certificates of Achievement, as well as the modification to the CIS A.S Degree have been approved. The CISCO Networking Administration, Database Management, and Computer User Support Specialist Certificates of Achievement are in queue. At the course

level, the Database Programming course (CIS 80), Advanced Database Applications course (CIS 29) and the new Computer Security and Forensics course (CIS 119) have been approved, and the Ethical Hacking (CIS 122), Project management Fundamentals (BUS 73) Personal Computer Support and Networking (CIS 40), and Internet, Social Media, and the Web (CIS 19) are in queue.

The board was impressed that so much progress has been made. The focus then shifted to the future. What changes should be made, and what areas are opening up. Five discussion topics were covered.

Discussion Topics

Database Management Certificate
This certificate has been developed and approved by the Chancellors office. The discussion for the board was the marketability of the certificate. After review, the panel agreed that the 3 key courses were perfect for the certificate, and overall the certificate is a great stepping stone program into a 4-year degree. The panel also agreed that a student earning this certificate could obtain an entry level position in a smaller company. Also, it could be marketed to larger companies where web architects might need a broader education in database design, development, and usability. The programming requirement was discussed. It was agreed it adds value to the certificate in that a database engineer would get hands on experience with how the database is used in a software application. The board also suggested and recommended the inclusion of a simpler programming course such as PHP, especially if integrated with one of the popular web databases, such as MySQL (an open-source relational database management system).

Project Management Certificate
Originally designed to be offered in CIS, it was determined it is better suited as a Business certificate, which provides hands on experience using project management software. A discussion occurred as to the target goal of the certificate. PMI (Project Management Institute) certification is key, and there are many levels available. The Certified Associate in Project Management (CAPM) is an entry-level certification for project practitioners, and that definitely should be an outcome. It would require some minor modifications to the proposed courses. Inclusion of a finance course focusing on budgeting and resources, rather than an accounting course, was recommended. The proposed Advanced Project Management course was deemed necessary, and either a) Systems Analysis and Design (CIS 18) or b) an Agile development methodology would round it out. If CIS 18 already includes the Agile Project Management components described, then it would be a good fit. This combination of courses would prepare the student for the CAPM certification and would offer real expertise in addition to knowledge.

Cyber Security
A lengthy discussion occurred in this area. It's a trending area in business (the fastest growing segment in Information Technology, expected to double in size by 2021), and an excellent opportunity for community colleges. If selected, a community college could even offer this as a 4-year degree. Dr. Rapp added that other schools were developing this curriculum, and that Coastline faculty were going to assist CIS in developing its curriculum. Many companies are forming their own cybersecurity departments. UCLA (University of Californian Los Angeles)

just built a security team of 16 people, and TMMC (Torrance Memorial Medical Center) has a team focused on cybersecurity now.

The proposed courses were reviewed. The Network Security Fundamentals course would add value by teaching the student how to set up networks and monitor them. The course would be geared toward the CompTIA NET+ certification. It was mentioned that vulnerability and risk management were not obvious in the proposed courses, and should be. Several certifications were mentioned, such as ISO27001 (International Organization for Standardization) and HIPAA (Health Insurance Portability and Accountability Act), and that CISSP professionals (Certified Information Systems Security Professional) need to understand them and know at least one of them well. Knowing these standards is 90% of the skillset. The panel agreed with the key courses, and also recommended that the Agile course, if developed, be included, and that LAW 4 be removed. Legal components that fit with the certificate should be covered in one of the other courses.

A suggestion was made to offer Cybersecurity as not only a certificate, but as A.S. Degree track "F" with CIS 140 and CIS 141 as required courses as well. This could help someone in industry advance. The board recommended that CIS faculty get a list of all of the possible certifications and determine where CIS fits in, and then market that matrix. At minimum, the goal of the certificate or degree should also be that the student qualifies to take the CISSP exam, which has 10 different domains, and that the material for each of the domains be covered in this program.

The Cyberpatriot program was discussed. A marketing strategy is to try to get high school students who are involved in the Cyber Patriot program to enroll at El Camino. To entice students, our curriculum would have to offer more than that presently covered in the Cyberpatriot program.

The discussion wrapped up with the proposed Cybersecurity conference. The Chancellors office wants campuses to host conferences and may even offer funding. The conference could be a "lunch & learn", for both staff and students, and tied in with cyber-attacks, a webinar, video, etc. The board mentioned the topics offered at the last conference were very contemporary.

Small Business Technical Support Certificate

The board discussed that small businesses are moving to the cloud. Dr. Rapp shared that Santa Monica College is partnered with Amazon Services to create a Cloud Computing Certificate. Their Strong Workforce Program (part of the Doing What Matters Program) funding was used to compensate Amazon. UCLA is all cloud.

Of the proposed courses, the proposed Network Security Fundamentals course (for Cybersecurity) could be included, and add cloud content should be added to that course. CIS 19 already covers SaaS (Software as a Service). CIS 119 should be included in the certificate as opposed to an ECHT course. The Database classes should consider instruction in cloud SQL. The question arose if CIS 11 could be tied into ITIL (Information Technology Infrastructure Library), as it would be a great way to introduce the student to industry practices. The board suggested possibly combining Small Business technical Support with the Help Desk track in the A.S degree, instead of developing a certificate. That might make it more marketable.

Information Technology and Electronic Medical Records
Health technology is becoming a booming career field. It's an area CIS should get into as it's a great fit for a 2-year degree student. The problem is finding qualified instructors for the program, if it is developed. CIS would need a full-time coordinator for this type of program. Might be able to attract someone from the industry. Professor Siddiqui indicated he would be interested in leading the development of the program.

Other areas that should not be overlooked is general Office Administration, and positions in the Medical Office, such as the Medical Secretary. The question came up as to how someone becomes an Administrative Assistant. Every office has them. This program could prepare students for careers in those areas.

Marketing
We have developed a robust CIS curriculum, competitive with other community colleges. Excellent ideas were proposed to help market our programs.

1) Record the cybersecurity conference and post it as a webinar or a YouTube channel
2) Develop internships. Can post internships/apprenticeships on Monster, Dice, and Indeed
3) High school events – especially of engaging students involved with the Cyberpatriot program
4) Use foundation donations to have high school counselors come to a lunch & learn.

<u>In Summary</u>
This was an excellent meeting with a lot of exciting new ideas for moving forward. The following items were proposed for development:

1) Modify the A.S degree to include the option in cybersecurity– Richard
2) Develop the Cybersecurity certificate - Richard
3) Develop a course in Network Security fundamentals for the cybersecurity certificate, which includes cloud storage – Richard
4) Present cybersecurity conference in fall - Richard
5) Combine Help Desk/Small Business Networking into the A.S. degree - Jay
6) Develop a new programming PHP/MySQL course for inclusion in certificates - Monica
7) Modify the Database certificate to include the new programming course - Randy 8) Modify a database class to include cloud SQL – Randy
9) Modify CIS 18 to include Project Management - Randy
10) Include ITIL content in CIS 11 - Jay
11) Develop the Electronic Medical Records/Medical Secretary program – Jay
12) Develop an OA program for Administrative Assistants – Randy & Monica

The board was thanked for their time and contribution. The meeting adjourned at 11:10AM.

Department of Computer Information Systems (CIS)

Advisory Board Meeting

Date: April 26, 2018 9:00 AM
Location: MBA 304

Attendees:
Kevin Laird, Director, Information Technology, KPMG
Debbie Goldwater, Director, IT Architecture and Security, UCLA
Jorge Mata, CIO LACCD
Fouad Jilani, Director, IT, Wedgewood Inc.
Sandy Coffey, Director of Enterprise Architecture, Farmers Insurance
Steve Lantz, Director, IT Infrastructure & Operations, Torrance Memorial Medical Center
Dr. Virginia Rapp, Dean, Business Division
Randy Harris, CIS faculty
Richard Perkins, CIS faculty
Monica Chaban, CIS faculty

The meeting began at 9AM with Dr. Rapp welcoming and thanking everyone for his or her participation. After introductions, the agenda and materials packet were distributed.

Conversation started with a discussion of cloud computing and its future in the IT world. It was discussed that businesses are moving to cloud storage and software, and that the basic threshold for a person's technical skill set is getting higher and higher. The California Cloud Computing Workforce was discussed and the curriculum development that is occurring in that area was discussed in depth. The advisory board indicated that CIS should develop that curriculum and an accompanying certificate as quickly as possible.

The also discussed that curriculum needs to be constantly evaluated and developed to keep up with the direction technology is moving in. That said, it was agreed that curriculum also needs to be approved faster, and re-evaluated every 2-3 years. Of the 12 proposed action items from last year, half of them were accomplished, along with additional items presented at this meeting. The board, knowing the time and effort it usually takes, was impressed that so much curriculum was developed/revised within the past year.

REVIEW OF COURSES

The first task focused on a final evaluation of our courses. Over the past several years, the board has recommended changes to courses and programs, and they either have been approved by the Chancellors office, or are in queue pending approval. The courses were reviewed and the new courses were presented (CIS 119, CIS 120, CIS 121, CIS 132, CIS 84, CIS 137). CIS 13 was discussed and it was suggested that course content be added covering PII and HIPAA compliance in the security module.

REVIEW OF PROGRAMS

A.S. Degree
All of the tracks were reviewed and agreed upon, and the board discussed and recommended

adding cloud computing as a future track. For the cybersecurity track, the board felt that perhaps CIS 40 and/or AJ 142 should be added, as they are in the certificate and make sense for the track. It was also recommended that in the Mobile and Web Programming track, CIS 30 be eliminated and replaced with CIS 28. It was further discussed that CIS 30, Introduction to Ecommerce, may have exceeded its lifetime and should either be inactivated or moved to the Business department. CIS 19, Internet, Social Networking, and the Web, then came under review. The advisory board recommended inactivating them as well. The rationale being that students are coming in with the basic skills covered in the course. They grew up with the internet, the web, and social media. Though these two courses (CIS 30 and CIS 19) made sense 8-10 years ago, they now are obsolete for today's generation of students.

Computer User Support Specialist Certificate of Achievement

Business 28 and 29 were discussed. The board felt effective communication skills are absolutely necessary in this career. The only consideration was that the pre-requisite for Business 28 (English1A), would require the student to take an additional course. The question arose as to if Business 28 could possibly be replaced by Business 27, which is similar, or if the pre-requisite for Business 28 could be changed to a recommended preparation.

Computer Systems Applications Certificate of Achievement

The intent of the certificate was discussed, especially as to where it would lead a student to, in the job market. Originally, it was designed to give students a background in CIS, but the tracks of study are now better defined in other certificates. It was suggested that the "user support" and "programming" tracks be eliminated, and that the certificate place more emphasis on common office software. Implementing that change would make the certificate very similar to that of the Business Information Worker certificate. The board recommended inactivating this certificate once all of the specialized certificates were in place.

Business Information Worker Certificate of Achievement

A comment was made that a better title could be developed, however it was explained that it wasn't by choice, as this is a global certificate, offered by many schools under the "Doing What Matters" program.

Cybersecurity Certificate of Achievement

A question was asked as to the inclusion of the AJ course, and it was explained that it was in agreement with that department several years ago. The board felt that the course was a good one to add and approved the content of the certificate.

CISCO Networking Administration Certificate of Achievement

The board felt the courses were appropriate and approved the inclusion of CIS 137.

Business Programming Certificate of Achievement

The board noted that CIS 19 and CIS 30 should be removed. It was recommended that CIS 30 be replaced by CIS 80, and that CIS 19 be replaced by CIS 119.
Database management

The board felt the inclusion of CIS 18 and CIS 119, though not database related, were good additions to the certificate.

GUIDED PATHWAYS

Guided pathways provide students with maps that suggest specific course sequences. Guided Pathways for three study tracks were proposed by the board: AREA 1ST SEMESTER 2nd SEMSTER 3rd SEMESTER 4th SEMESTER Programming CIS 13 and CIS 18 CIS 16 and CIS 132 CIS 133 and CIS 134 CIS 136 Database CIS 13 CIS 28 CIS 29 and CIS 84 CIS 80 Cybersecurity CIS 13 CIS 137 and CIS 119 CIS 121 and CIS 122 CIS 120

CERTIFICATES OF ACCOMPLISHMENT

Developing and offering Certificates of Accomplishment is a way to introduce a student to a career field. These certificates are intended to be a subset of the Certificates of Achievement, and would be something a student could earn by taking as few as 2-4 courses. The following ideas were proposed: Certificate of Accomplishment Courses

- Small Business Networking CIS 13, CIS 137/CIS 11, CIS 40
- Office Administration Applications CIS 2, CIS 13, CIS 26
- Website Creator CIS 13, CIS 132, CIS 133 Database Developer CIS 13, CIS 28, CIS 29/80 Cyber Forensics CIS 13, CIS 119, CIS 120, CIS 137

MARKETING CAMPAIGN

In the past, the board has discussed the challenges of marketing CIS programs. Last fall, the CIS department applied for a CTEA grant (CARL D. PERKINS CAREER AND TECHNICAL EDUCATION IMPROVEMENT ACT) and was awarded $20,000 in funding for CIS marketing purposes.

CIS has worked with El Camino Colleges' publications department to develop a CIS Logo, and to strategize marking efforts. Additionally, CIS developed an Excel/Access reference card to give to all CIS 13 students, to be used not only as a reference, but as an effort to have the students help market as well. Copies were distributed to all board members. New CIS tri/four fold flyers will be created, as the ones CIS currently has are obsolete. Part of the funding has gone toward these efforts.

CIS faculty have received 3 proposals to develop digital marketing strategies. A demonstration of ElderTree's and Substance Media's demo product was shown. The board agreed that the production by Substance Media was the best and recommended the department use that firm.

1) 5ifty & 5ive: to develop a social media and geofence/email campaign – estimate $10,000
2) ElderTree: to develop a video, email/geofence, card display – estimate $56,600
3) Substance Media: to develop 7 mini-videos – estimate $17,200

The board felt the email campaign might be a waste of money, as students rarely read email anymore – it's all about social media and texting. The mini-videos will be used in Facebook campaigns and also at college fairs and outreach events. As these estimates are high, and the remaining funding is not enough to cover the estimates, it was suggested we try to get the price

lowered. Steve Lantz will provide some rough costs from TMMC.

In Summary

This was an excellent meeting with many action items for moving forward. The board was thanked for their time and contribution. The meeting adjourned at 11:30AM.