Instructional Program Review Report
Sierra College, 2016-17

Department/Program Name: <u>Computer Information Systems</u>

Date Submitted: <u>February 15, 2017</u>

Submitted By: <u>Melissa Prinzing</u>

Ideally, the writing of a Program Review Report should be a collaborative process of full-time and part time faculty as well as the appropriate educational administrator, instructional assistants, classified staff members and students who have an interest in the present and future vision of the program at all sites throughout the district. The Program Review Committee needs as much information as possible to evaluate the past and current performance, assessment, and planning of your program.

1)   <u>**Relevancy**</u>**: This section assesses the program's significance to its students, the college, and the community.**

    1a) To provide context for the information that follows, describe the basic functions of your program.

Computer Information Systems (CIS) provides 26 courses and 12 programs (with 4 degree/certificates of achievement and 4 mini skills certificates) related to a variety of computing topics:
- digital literacy
- applying business computer software – such as MS Office
- tech support
- networking and security
- business information systems
- project management
- virtual office professional business management
- and more

The software classes range from beginning word processing to more advanced courses such as database design.

Our tech support and networking security programs start with an IT hardware and software essentials course, followed by a networking fundamentals course, includes client and server configuration/administration, and builds to computer security and ethical hacking courses. These courses are aligned with industry certifications.

The virtual office program helps prepare students to work from home offering a wide range of computer support services to companies that choose to outsource work.

CIS course, certificates and degrees include emerging concepts and trends in technology such as cloud computing and virtualization, which better prepare students for achieving their goals. There is a significant interest from students to understand and use cloud services. Through the Strong Workforce Initiative (SWI), the department is beginning a thorough study of further emerging information system technologies and plans to expand and develop specializations in Business Information Worker, Cyber Security, Big Data and Data Analytics.

1b) How does your program support the district mission, as quoted below? Please include an analysis of how your program supports ISLOs (Institutional Student Learning Outcomes): Communication, Technology and Information Competency, Critical and Creative Thinking, and Citizenship?

"Sierra College provides an academic environment that is challenging and supportive for students of diverse backgrounds, needs, abilities, and goals with a focus on access, equity, student-centered learning, and achievement. The college is committed to practicing diversity and inclusion, and recognizes that a diverse and inclusive curriculum and workforce promotes its educational goals and values. Institutional learning outcomes guide the college's programs and services, encouraging students to identify and expand their potential by developing knowledge, skills, and values to be fully engaged and contributing members of the global community. Sierra prepares students by offering Associate's and transfer degrees, certificates, career and technical education, foundational skills, as well as lifelong learning and enrichment."

These days, expanding computer knowledge, skills and abilities are essential for students of all backgrounds, needs and abilities to be connected, informed, and engaged as a contributing member of their communities.

CIS department dashboard demographic data shows that the department reflects the district's diversity, except that in CIS, we have more first generation students and our population is generally older.
- These students may feel a greater need to develop computer literacy to be informed and connected.
- Career skills quickly obtained in a CIS course or two, may be particularly valued by first generation students seeking movement from poverty to living wage on to a good education/career path.
- Older student data reflects the important role of CTE/Lifelong learning to stay employable and to grow one's career.

The CIS department provides challenging and supportive learning environments for students with a wide range of diverse goals, abilities, and needs:

- from basic skills to transfer students
- from entry level office workers to high tech workers

Department faculty members have participated in training, and continue to partner with on campus student programs to ensure we provide a supportive environment for the success of our various student populations– Umoja, FYE, Safe Space, PassPeer, DLIT…

The CIS department encourages students to identify and to expand their potential. For example:
- supporting beginner students (many from underrepresented populations) in crossing the digital divide
- providing technical training for Business Majors and others seeking computer skills to support their transfer or associate degrees
- challenging our most technically advanced networking and security students to acquire skills to seek promotion in high tech careers

CIS students can identify their technical interests and abilities and use them to cross the digital divide to become better-equipped for academic work, move from poverty to living wage jobs, and/or progress on a great career path.

Department program outcomes align extensively with institutional outcomes as shown in this portion of the CIS SLO spreadsheet.

	Program Outcomes for CIS Department	
A	Research, analyze and evaluate information to solve business problems using appropriate computer technology.	1A, 2B, 2C, 2D, 3A, 3B, 3C
B	Design and produce computer technology solutions incorporating current trends, security, and best practices.	1A, 1B, 1C, 1D, 2B, 2C, 2D, 3A, 3B, 3C, 3D, 4A, 4C, 4D
C	Effectively employ computer technology concepts and terminology in professional communication.	1A, 1B, 1C, 1D, 2A, 3A, 3D, 4D
D	Demonstrate marketable computer technology career skills	2A, 2B, 2C, 2D

In addition to the chart above, following are brief highlights of some of the ways CIS programs support ISLOs:

Communication: A great deal of communication these days is expressed via technology, typed documents, email messages, online discussion postings, business data reports, business graphics, presentation visuals. In CIS, students practice more than the mechanics of software operation but also learn to employ best practices for applying technology for effective communication.

Technology and Information Competency: This area of institutional outcomes is probably the most obvious, and is a direct match for the CIS department's role and strengths. Our programs center on this outcome area.

Critical and Creative Thinking: In CIS, troubleshooting and problem solving skills that require critical and creative thinking, are widely required of and practiced by our students. In designing presentation visuals, publications and webpages, students express creativity as well. When conducting Internet searches, students must critically evaluate sources.

Citizenship: More and more, much community communication and interaction is facilitated through the use of computer technology. Some technical computer skills as well as knowledge of appropriate online practices are essential in order to access vital information and to be engaged and contributing citizens.

1c) Program offerings align with which of the following mission categories (check all that apply):

X Transfer   **X** Career Technical Education
X Basic Skills   **X** Personal Development/Enrichment   **X** Lifelong Learning

1d) Please analyze your department's role and its success in supporting the mission categories marked in 1c above. Please provide evidence in support of this analysis. If any of the following apply to your program, please address them in your analysis.
- Degrees, certificates, and/or licenses your department has generated:
- The alignment of these awards with the district's mission and/or strategic goals. (See the district "Awards Data File, available from Research and Planning, for your numbers).
- Job placement or labor market information for your program's awards and licenses.
- The contribution your program makes to student transfer.
- Participation in basic skills programs.

All students need computer skills to succeed in their college courses regardless of their major.

- In addition to CIS programs, there are 18 other degrees or certificates listed in the 16/17 Sierra College catalog which include one or more CIS courses.
- Over 1/3 of all CIS courses are included in a program(s) outside of CIS.
- Departments ~~including~~ listing a CIS course(s) in their programs include:
  - Business
  - Communication Studies
  - Computer Science
  - Geography
  - Physics

Transfer:
CIS plays a role in transfer, particularly for Business students.
- CIS50 Applying Computer Software and CIS62 Business Information systems courses satisfy Business AS-T transfer degree requirements.
- CIS50, 62 and CIS80 Spreadsheets in Business courses are typical of the courses most Business transfer students take.
- Many Business students, planning to transfer to Sac State, take CIS50 or CIS62 specifically as an alternative to a required computer skills exam at Sac State Business School.

CTE:
Our entire department and all our courses consist entirely of career and technical education.
- Students are seeking computer skills to:
  - gain employment
  - start their own business
  - earn third party industry certifications
  - achieve promotions
- Many CIS students take CIS courses to directly prepare for careers in offices and IT departments.
- Students can build entry level job skills within 6 months, begin working and earning, while simultaneously continuing their education to advance their careers. This can be a life changing opportunity for students from low income backgrounds.
- Other CTE departments including CIS courses in their programs include:
  - Administration of Justice
  - Engineering
  - Recreation Management

- **Awards Data File:**
  - We observe that *Computer Infrastructure and Support* awards *(070800)* shot up dramatically from one or two per year to 28 awards in 2015-16.
  - The department implemented some stackable certificates in this area, which appear to be a success.

Basic Skills:
We consider digital literacy as essential for success in college and the workplace as math or English.
- Many students entering the community college system are still in need of Basic Skills and CIS also provides much needed training at this level.
- Research office data indicates that of the students who were assessed in our CIS30 classes (approximately 90% from 2009-2016) , only about 10% placed at college level for math, 33% for writing, and 48% for reading.
- While not officially recognized by the state definition of "Basic Skills", CIS30 and 30L teach basic computer literacy, and have aligned with related ESL and Basic Skills programs.

Personal Development & Lifelong Learning:
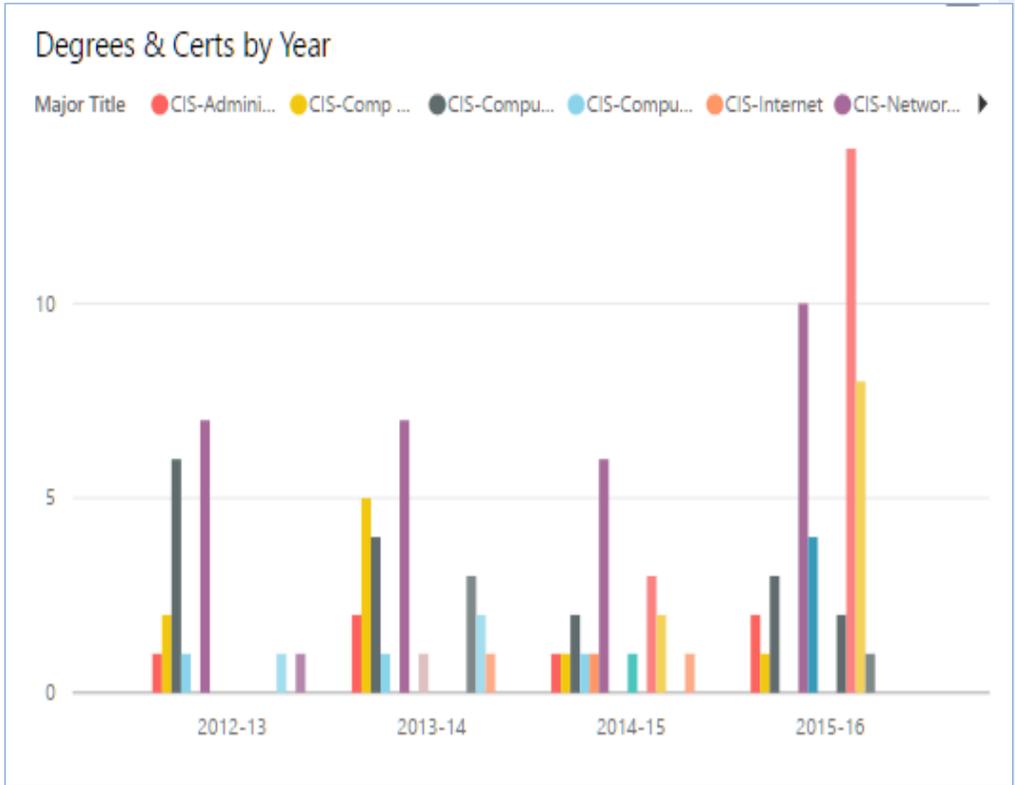Because technology is constantly changing, our department plays a significant role in lifelong learning.
- Lifelong learning is essential in technology fields. Many of our students are updating skills and seeking promotions to advance in their careers.
- Some students, especially older students, take computer skills courses as a form of personal development and lifelong learning.

CTE/Life Long Learners:
The department's plans to expand instruction in cyber security, big data and data analytics, are directed at the needs of CTE/Life Long Learners – workers returning to college for additional updated training to expand their careers. According to the Jan 14, 2017 edition of "The Economist":

"A college degree at the start of a working career does not answer the need for the continuous acquisition of new skills, especially as career spans are lengthening." And further "According to the Pew survey, 54% of all working Americans think it will be essential to develop new skills throughout their working lives. Among adults under 30, the number goes up to 61%. Another survey, conducted by Manpower in 2016, found that 93% of millennials were willing to spend their own money on further training."

Degrees & Certs by Year

Major Title ●CIS-Admini... ●CIS-Comp ... ●CIS-Compu... ●CIS-Compu... ●CIS-Internet ●CIS-Networ... ▶

Trend: Dashboard chart shows a trend of an increasing number of awarded degrees and certifications.

Awards	2013-14	2014-15	2015-16	3 Yr Avg
AA	9	5	8	7.33
AS	6	5	12	7.67
AA-T				#DIV/0!
AS-T				#DIV/0!
Certificate	16	10	30	18.67
Total	31	20	50	33.67

Trend: DSR data shows awards went down one year, then recovered and increased the next.

Job Placement and Labor Market Data:
The Bureau of Labor Statistics projects an increase of 18 percent in all computer occupations nationally between 2012 and 2022.

The Employment Development Department labor market report titled, "2014-2024 Fastest Growing Occupations Sacramento--Roseville--Arden-Arcade Metropolitan Statistical Area" lists **Network Architects** with a percent change of 29.8% between 2014-2024. This career path aligns with our Networking and Support degree/certificate.

In another article from "The Economist", Matt Sigelman of Burning Glass says the biggest demand is for new combinations of skills. The composition of new jobs is changing rapidly. Over the past five years, demand for **data analysts** has grown by 372%. Through the Strong Workforce Initiative (SWI), department plans are underway to develop a Data Analytics specialization.

For the foreseeable future, the demand of highly skilled IT professionals is expected to outpace the supply, according to human resource consulting firm Robert Half. Specifically, Robert Half predicts companies will be seeking talent in **big data** and **security**. The department currently has a Networking and Security degree/certificate, and plans are underway to expand and develop the Cyber Security portion of the department as well as developing a Big Data specialization.

According to Wesley W. Simpson, chief operating officer at (ISC), in his Jan 2017 article in "Certification Magazine":

"The **cybersecurity** skills gap is very real. While estimates run the gamut, the global demand for cybersecurity workers is projected to soar to 6 million by 2019. According to projections by cybersecurity solutions provider Symantec, 1.5 million of those jobs will not be filled."

"A career in cybersecurity should hold considerable appeal, particularly with respect to job security and professional growth, as reflected by corporations' dedication to the task at hand. Spending on cybersecurity solutions and services is expected to increase from less than $122.5 billion currently to about $202.4 billion in 2021, according to research from Markets-and-Markets."

The CIS department currently has a Networking and Security degree/certificate, and plans are underway to expand and develop the Cyber Security portion of the department.

Cloud Security is the most difficult information technology skill for employers to find in the labor market. On average, it takes employers more than three months (96 days) to fill a job that requires Cloud Security skills. That's more than double the IT industry average of 45 days. This analysis is based on the Burning Glass database of job postings from Sept. 2015 to Aug. 2016.

Labor Insight Jobs (Burning Glass Technologies) "Top Title" report identified over 1,600 California **cyber security** or **business analytics** titled job postings during the period Nov. 2015 – Nov. 2016. These jobs correspond with current programs and department plans for development and expansion.

The Employment Development Department, labor market report titled, "2014-2024 Fastest Growing Occupations Sacramento--Roseville--Arden-Arcade Metropolitan Statistical Area" identifies **Database Administrators** with an increase percent change of 35%, and **Computer System Analysts** at an increase of 29.8%, during the 2014-2024 period. These careers also correspond with department plans for development and expansion.

The CIS department provides MS Office software training for Business Information Workers in alignment with the state's BIS career pathway. Our "Applications" degree/certificate will be renamed "Business Information Worker" effective Fall 2018.

The Employment Development Department, labor market report titled, "2014-2024 Occupations With the Most Job Openings for Sacramento--Roseville--Arden-Arcade Metropolitan Statistical Area" ranks "**Office Clerks, General**" as 7th, with 7,780 total job openings projected during 2014-2024. This job would corresponds with our (BIW) Applications degree/certificate.

A 2015 study done by Burning Glass Technologies determined that 78 percent of middle skill jobs require a baseline of digital skills that includes **spreadsheet** and **word-processing** abilities.

Change the Equation, a non-profit organization focused on promoting STEM education, reported that 58 percent of millennials have poor skills in problem solving with technology, meaning they would be unable to perform a task with multiple steps and applications, such as organizing a **spreadsheet** and **emailing** it to a coworker. These are the types of skills developed in the CIS department Applications/BIW degree/certificate as well as the Virtual Office degree/certificate.

The BIW skills the CIS department addresses currently, and the business data analysis skill the department plans to expand and develop, are needed and lacking in the workplace. According to Megan Elliott in her October 2016 article on Money and Career CheatSheet website, titled "Unqualified? 5 Computer Skills That Too Many People Lack":
   "Employers of all types complain of a skills gap, especially when it comes to technology. They have jobs for people who are comfortable with computers

and know how to use specialized software, they just can't find anyone to fill them.
Eighty-seven percent of young grads rate themselves well prepared for today's demanding careers, Payscale found. But only 50% of managers say the same thing."

In Elliott's article the first skill named on her list of 5 computer ~~lacking~~ skills many people lack ~~list~~ is "**Excel**, **Word**, **PowerPoint**." She says:
"**Microsoft Office** is virtually essential if you want to land a job in any office. Sixty-seven percent of "middle-skill" jobs, such as **administrative assistant** or store manager, require proficiency in **Word** or **Excel**. Plus, positions requiring those skills pay 13% more than those that don't, according to a report by CapitalOne and Burning Glass Technologies."
"A 2015 Change the Equation study found 60% of millennials couldn't sort or search for data in a **spreadsheet**. To be fair, 70% of workers between the ages of 35 and 64 also struggled with tasks like sorting **email** responses and working with **spreadsheets**."

Data Analysis also makes Elliott's "Unqualified? 5 Computer Skills That Too Many People Lack" list:
"**Statistical analysis** and **data mining** was the second-most in-demand job skill for 2016, per LinkedIn. Yet 36% of managers Payscale surveyed said recent grads weren't proficient in **data analysis** using tools like **Excel**, Tableau, and Python."

California Community Colleges Chancellor's Office, Salary Surfer web site **Computer and Information Science** data:

Award Type	Median Annual Salary		
	2 Years Before	2 Years After	5 Years After
Computer Information Systems Degree	$29,990	$40,420	$47,840
Computer Information Systems Certificate	$21,726	$40,798	$49,001
Computer Infrastructure and Support Degree	$37,755	$46,669	$49,150
Computer Networking Degree	$34,715	$55,311	$65,291
Computer Networking Certificate	$40,343	$53,287	$58,978
Computer Support Degree	$31,363	$39,896	$46,139
Computer Support Certificate	$30,471	$39,951	$53,086
Software Applications Degree	$22,820	$30,596	$42,448
Software Applications Certificate	$18,637	$25,936	$33,035

According to the Centers of Excellence (COE), Northern California Region, Aug. 2016 report titled "Regional Labor Market Assessment Greater Sacramento Region"-, **Computer User Support Specialists** is the occupation that has the most employment and the most projected annual job openings. This is exactly what the CIS Tech Support degree/certificate is all about.

SOC	Occupation	2015 Jobs	5-Yr Change	5-Yr % Change	5-Yr Replace-ments	Annual Openings
15-1151	Computer User Support Specialists	3,945	339	9%	277	123
15-1142	Network and Computer Systems Administrators	1,885	147	8%	137	57
15-1134	Web Developers	1,250	149	12%	89	48
15-1152	Computer Network Support Specialists	1,268	90	7%	87	35
15-1199	Computer Occupations, All Other	1,336	55	4%	105	32
15-1143	Computer Network Architects	591	42	7%	54	19
	Total	10,276	822	8%	747	314

The chart above comes from the same Centers of Excellence report. The CIS department Networking and Security degree/certificate and our Tech Support degree/certificate prepare students for all the above occupational career paths, (with the exception of Web Developers).

The COE report also identifies the wage gains for "skill builders", students who take at least .5 units, but don't obtain an award. For Computer And Mathematical courses there was an average 23% annual wage gain achieved.

The same Centers of Excellence report goes on to also identifiesy the top occupation cluster with the most middle-skill workers in the Greater Sacramento Region as **Office & Administrative Support**. Following is a partial list:

SOC	Occupation	2015 Jobs	5-Yr Change	5-Yr % Change	5-Yr Replace-ments	Annual Openings
43-4051	Customer Service Representatives	13,416	1,436	11%	1,776	642
43-1011	First-Line Supervisors of Office and Administrative Support Workers	14,651	966	7%	1,177	429
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	15,426	812	5%	945	351
43-9041	Insurance Claims and Policy Processing Clerks	4,500	126	3%	856	196
43-3031	Bookkeeping, Accounting, and Auditing Clerks	12,298	23	0%	866	178
43-6013	Medical Secretaries	3,890	592	15%	229	164
43-3021	Billing and Posting Clerks	3,313	439	13%	379	164
43-3071	Tellers	3,276	(477)	(15%)	649	130
43-6011	Executive Secretaries and Executive Administrative Assistants	6,057	4	0%	415	84
43-5032	Dispatchers, Except Police, Fire, and Ambulance	1,930	158	8%	258	83
43-3011	Bill and Account Collectors	2,427	57	2%	357	83
43-5061	Production, Planning, and Expediting Clerks	1,867	109	6%	266	75
43-3051	Payroll and Timekeeping Clerks	1,356	51	4%	191	48
43-4131	Loan Interviewers and Clerks	1,471	68	5%	159	45
43-9021	Data Entry Keyers	2,083	27	1%	154	36
43-4031	Court, Municipal, and License Clerks	2,391	77	3%	74	30
43-6012	Legal Secretaries	2,127	(65)	(3%)	140	28
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1,598	40	3%	97	27
43-4061	Eligibility Interviewers, Government Programs	1,475	42	3%	82	25

These occupations align well with the CIS Department Applications degree/certificate as well as the Virtual Office Professional degree/certificate.

The COE report also identifies the wage gains for "skill builders", students who take at least .5 units, but don't obtain an award. For **Office and Administrative Support** Occupation courses - there was an average 16.6% annual wage gain achieved.

United States Department of Labor data from 2015:
"Employment of computer and information technology occupations is projected to grow 12 percent from 2014 to 2024, faster than the average for all occupations. These occupations are expected to add about 488,500 new jobs, from about 3.9 million jobs to about 4.4 million jobs from 2014 to 2024.

"The median annual wage for computer and information technology occupations was $81,430 in May 2015, which was higher than the median annual wage for all occupations of $36,200."

1e) Optional Additional Data: Comment on any other relevant contributions of your program to the district mission, goals, outcomes, and values not incorporated in the answers above. Examples include but are not limited to contributions to student equity and success, diversity, campus climate, cultural enrichment, community ties, partnerships and service, etc. Include specific data and examples.

DISTRICT GOALS
Educational Effectiveness
- All CIS courses better equip students with computer skills which promote and support student opportunity, success and achievement.
- The CIS30 basic computer literacy course, explicitly integrates college success topics and soft skills with technical computer skills.
- The department operates drop-in computer labs, providing hours of computer access and assistance for all Sierra students' success with course work.

Organizational Effectiveness
The CIS department contributes to the district's goal to manage its resources to best meet its multiple missions.
- The department classrooms and labs are used by other campus departments and programs such as for: business department courses; counseling, orientations, group advising, and Staff Development activities.
- The department makes good use of student help and classroom time slots in between scheduled classes by offering drop-in computer lab hours open to all Sierra students.

Relevant to Student Needs:
Our drop-in computer labs/hours support all Sierra students, especially those who lack their own technical resources and those who need assistance. Some of our faculty also offer online office hours for students taking online classes.

2) **Currency:** This category assesses the currency of program curricula as dictated by Title 5 and the currency of efforts in meeting accreditation standards as well as improving pedagogy and engaging in professional development.

2a) Curriculum: Comment on the currency of your program's curricula, including discussion of any recent or projected changes. Please describe your process for evaluating and revising curriculum, including the use of SLOs.

Curriculum Update Data: WebCMS shows that all CIS department courses were updated and approved in Fall 16.

Course	Suppl	Course Title	Date Approved
CIS 0136	Y	PROJECT MANAGEMENT CONCEPTS AND SOFTWARE	9/12/2017
CIS 0066	Y	ROUTING AND SWITCHING ESSENTIALS	9/26/2016
CIS 0026	Y	INFORMATION AND COMMUNICATION TECHNOLOGY ESSENTIALS	9/12/2016
CIS 0028	Y	INDEPENDENT STUDY	9/12/2016
CIS 0030	Y	COMPUTER LITERACY FOR COLLEGE SUCCESS	9/12/2016
CIS 0030L	Y	COMPUTER LITERACY FOR COLLEGE SUCCESS - SUPPLEMENTAL LABORATORY	9/12/2016
CIS 0050	Y	APPLYING COMPUTER SOFTWARE	9/12/2016
CIS 0050L	Y	APPLYING COMPUTER SOFTWARE - SUPPLEMENTAL LABORATORY	9/12/2016
CIS 0052	Y	CREATING A VIRTUAL OFFICE	9/12/2016
CIS 0053	Y	MARKETING A VIRTUAL OFFICE	9/12/2016
CIS 0054	Y	MANAGING A VIRTUAL OFFICE	9/12/2016
CIS 0062	Y	BUSINESS INFORMATION SYSTEMS	9/12/2016
CIS 0065	Y	COMPUTER NETWORK FUNDAMENTALS	9/12/2016
CIS 0067	Y	FOUNDATIONS FOR CREATING WEB PAGES	9/12/2016
CIS 0070	Y	WORD PROCESSING-BEYOND THE BASICS	9/12/2016
CIS 0080	Y	SPREADSHEETS IN A BUSINESS ENVIRONMENT	9/12/2016
CIS 0088	Y	COMPUTER FORENSICS FUNDAMENTALS	9/12/2016
CIS 0090	Y	DATABASE MANAGEMENT	9/12/2016
CIS 0095	Y	INTERNSHIP IN COMPUTER INFORMATION SYSTEMS	9/12/2016
CIS 0100	Y	SOFTWARE FOR DYNAMIC PRESENTATIONS	9/12/2016
CIS 0105	Y	MICROSOFT OUTLOOK-MANAGING INFORMATION	9/12/2016
CIS 0120	Y	CREATING BUSINESS GRAPHICS WITH MICROSOFT PUBLISHER	9/12/2016
CIS 0141	Y	INSTALLING, CONFIGURING AND ADMINISTERING A CLIENT OS	9/12/2016
CIS 0142	Y	SYSTEMS AND NETWORK ADMINISTRATION	9/12/2016
CIS 0147	Y	INTRODUCTION TO INFORMATION SYSTEMS SECURITY	9/12/2016
CIS 0148	Y	VIRTUALIZATION CONCEPTS AND TECHNOLOGIES	9/12/2016
CIS 0149	Y	DATABASE ADMINISTRATION IN A CLIENT/SERVER ENVIRONMENT	9/12/2016
CIS 0151	Y	INFORMATION STORAGE AND MANAGEMENT	9/12/2016
CIS 0152	Y	INTRODUCTION TO CYBERSECURITY: ETHICAL HACKING	9/12/2016

Process: Because technology changes rapidly, new versions of existing programs are coming out every couple of years, and the CIS department is constantly evaluating and updating course content, teaching materials and curriculum.

- We follow industry trends online, read publications, attend conferences, network with peers, examine new texts, stay abreast of statewide pathways, and consult with advisory boards.
- Using feedback from advisors, students and assessment observations, we revise existing courses, degrees and certificates to reflect the changing needs of industry, and to ensure that our students are learning relevant, current information.

In Summer 2016, the department held a retreat to discuss, update and revise all our course and program SLOs. These updates were approved by the Curriculum Committee in Fall 2016.

Recent Changes: Over the past several years we have experimented with removal of lab hours from some courses.

- In some cases, this worked very well.
- In others, it was clear that these lab hours needed to be restored to provide sufficient time for the development of skills and effective instructor/student contact.

Plan: Using Strong Workforce Development grant funding, the department will be launching a significant, multi-year initiative to update/revise the department identity and offerings, starting with a large-scale review of the industry in 2017.

2b) Student Learning Outcomes Assessment: Analyze your program's assessment of course outcomes, analysis of results, and improvements/changes made to the program as a result of this assessment. Please provide specific data and analysis in the space provided.

At each Flex week SLO Assessment Planning and Assessment meeting, the department faculty discuss assessments conducted the prior semester, fill out and discuss and edit the SLAS forms, and complete the required DAA form. The department chair stays in close contact and consultation with the department's SLO Assessment representative, Jason File, to ensure all assessments are properly completed.

SLO Assessments have resulted in the following improvements and changes made (or proposed) to our programs:

- Added CIS26 as an advisory for CIS65.

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- Refurnished V107 to accommodate hands-on computer hardware maintenance student activities using work tables. The room redesign also provided for adequate/secure storage of student projects between class meetings.
- Department requested assorted mobile computing devices to train with and use in class for more realistic customer service skill development.
- Department requested new projectors for classrooms at Rocklin.
- Department requested equipment and institutional support for streaming classroom video to remote students.
- Part-time faculty interview question/teaching demo was changed based on identifying a need for better encryption skills.
- Because one assessment revealed that a low points assessment was not taken very seriously and that, in fact, some students chose not to even complete it, the instructor resolved to increase the points in future.
- Many of the assessments revealed particular elements of student skills that the instructors had not realized needed special attention, clarification, and emphasis in class. These revelations informed our instruction going forward.
- Assignments were revised, and in some cases broken down into smaller segments. More examples were provided for students.
- Many of the assessments inspire instructors to provide students with more online resources for successful attainment of outcomes.
- CIS Students in CIS88 (cross listed with Administration of Justice) were partnered with ADMJ students on the first day of class to help each other with the technical and legal aspects of the course.

During the first few years of structured assessment of course and program outcomes the department learned a lot about the process and determined that we wanted to revisit the creation of our outcomes. We had a very large and complicated set of outcomes – too large and complicated to be very useful.
- The department reviewed and updated all CIS program and course SLOs over the summer of 2016.
- At the Fall 16 flex, faculty spent time brainstorming ideas for how to assess many of the new SLOs.
- The new CIS SLOs were approved by the Curriculum committee in Fall 16.
- Starting Spring 17, faculty will begin assessing the new outcomes.

In the space below, please describe or attach the cycle you have developed for outcomes assessment.

Schedule course assessments so all will be assessed by Sp19:

	Semester	~~to Assess~~	**Who Will Assess**
CIS 26	F 17	Darla	
CIS 30	F 17	Charity	
CIS 30L	S 18	Charity	
CIS 50	Sp 17	Melissa	
CIS 50L	Sp 17	Malena	
CIS 52	F 18	Cyndi	
CIS 53	Sp 18	Cyndi	
CIS 54	Sp 19	Cyndi	
CIS 62	F 18	Malena	
CIS 65	Sp 18	Darla	
CIS 66	Sp 18	Shawn	
CIS 67	F 17	Debbie	
CIS 70	Sp 17	PJ	
CIS 80	Sp 18	PJ	
CIS 88	F 18	Shawn	
CIS 90	F 18	Annette	
CIS 100	Sp 17	Annette	
CIS 105	Sum 17	Bushnell	
CIS 120	Sum 17	Cyndi	
CIS 136	Sp 17	Annette	
CIS 141	Sp 18	Buddy	
CIS 142	F 17	Andy	
CIS 147	F 17	Jaime	
CIS 148	TBD	TBD ~~are we teaching this one anymore? when?~~	
CIS 149	TBD	TBD ~~are we teaching this one anymore? when?~~	
CIS 151	TBD	TBD ~~are we teaching this one anymore? when?~~	
CIS 152	F 18	JT	

2c) Professional development: Please describe how your department's individual and group activities and professional development efforts serve to improve teaching, learning and scholarship.

The CIS faculty, both Part-Time and Full-Time, are very involved with a wide variety of professional development activities both on campus and off.

A sampling of **on-campus programs** in which CIS faculty have participated include:
- Sierra Online Summit
- Preventing Discrimination and Harassment

- McGraw Hill SIMnet product trainings
- Attending Flex Trainings:
    - Distance Learning Round Table
    - Canvas Beyond the Basics
    - Cross Cultural Simulation
    - Safe Space
    - Internship Instructor Training
    - Using Starfish
    - Mindfulness Workshops
- Presenting/Facilitating Flex Activities:
    - OneNote 2016
    - iPad in the Classroom
- Presenting Student Success Workshops:
    - OneNote 2016
    - PowerPoint Basics
    - MLA Formatting in Microsoft Word
    - Word Source Manager
    - Canvas Basics
- Advisory Meetings with Industry Partners, at least twice per year
- Department meetings throughout the year with both FT-PT faculty for planning/program development

Some of the **off-campus involvement** includes:
- CyberWatch West
- BESAC
- State Career Pathways Discipline Review Group
- CAE/2Y
- Making Across the Curriculum
- WASTC

Examples of **Lynda.com** courses studied by various faculty include:
- User Experience Fundamentals for Web Design
- Writing for the Web
- The Neuroscience of Learning
- Foundation of It Security: Core Concepts
- Webinar Fundamentals
- IT Security Career Paths and Certifications
- Securing Your Mobile Device

A sample of **Conferences** attended:

- McGraw Hill SIMnet and Connect product trainings
- Here to Career Conference
- ICT Educator Conference
- CCAOE Leadership Academy
- MPICT Faculty Development Conference
- North/Far North Faculty Development Conference
- CA State Cyber Security Symposium
- Sac Tech Summit
- NICE Cyber Security
- Infragard (FBI Outreach)
- McGraw Hill MIS/BIS Event

In the Information Technology world, many professionals validate their skills by taking industry certification exams.

Examples of **Industry Certifications** held by various faculty include:

- CompTia A+
- CompTia Network+
- CompTia Security+
- CompTia Certified Technical Trainer (CTT)
- EMC Certified certified iIformation, Storage and Management
- Microsoft Certified Systems Administrator
- Microsoft Certified Trainer
- VMWare Certified Professional (VCP)
- Palo Alto Networks ACE

In addition, we updated our software classes from Windows 7/8 and Office 2013 versions to Windows 10 and Office 2016 versions in the Fall of 2016. This necessitated up-skill efforts and significant rework and updates to teaching materials. The majority of our faculty also up-skilled and transitioned from Blackboard to Canvas to stay current in "web-enhancing" their on-ground classes.

As is evident from the lists above, our faculty are working hard to stay current with today's technology trends and to ensure that courses are up to date and meet the changing needs of industry.

In addition, we updated our software classes from Windows 7/8 and Office 2013 versions to Windows 10 and Office 2016 versions in the Fall of 2016. This necessitated up-skill efforts and significant rework and updates to teaching

~~materials. The majority of our faculty also up-skilled and transitioned from Blackboard to Canvas to stay current in "web-enhancing" their on-ground classes.~~

Faculty also develop and grow professionally while serving in a variety of shared governance processes on campus.

Members of the department serve on **committees** across campus including:

- CTE Committee (2) – 1 Faculty Chair & 1 Department Representative
- Technical Education Committee
- Faculty Senate
- DLIT (Distance Learning) Committee
- SCFA – Part-Time Representative
- NFN Regional Consortium
- FERC Committee
- Strong Workforce Initiative Taskforce
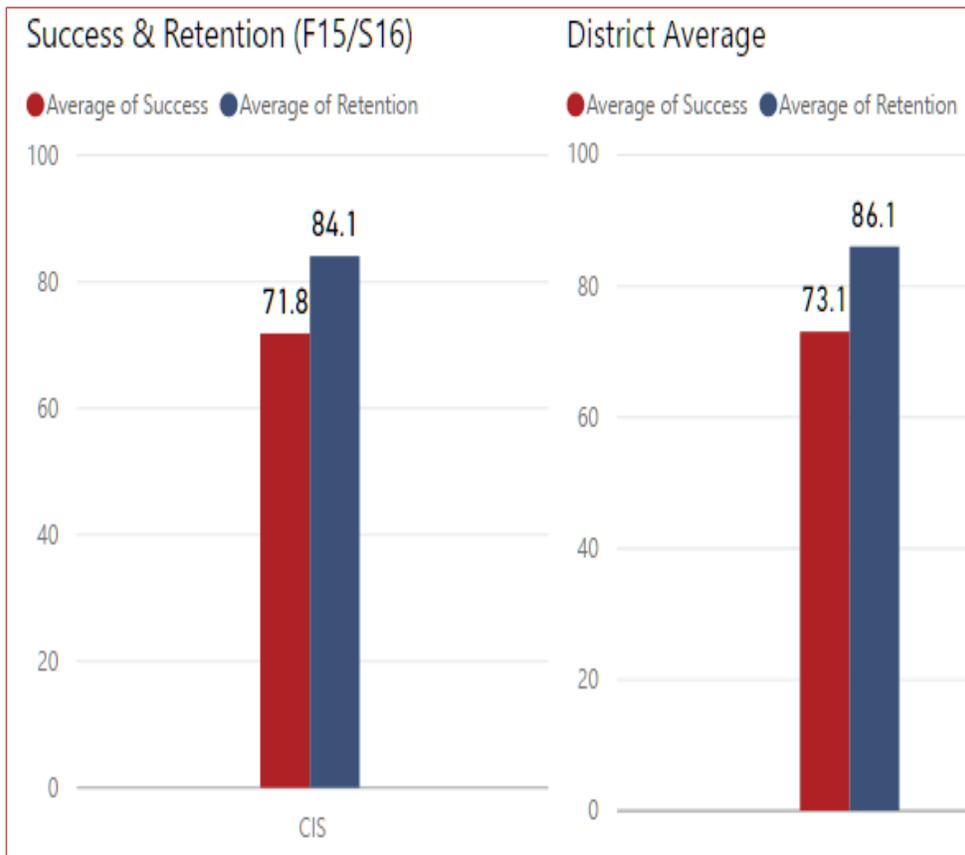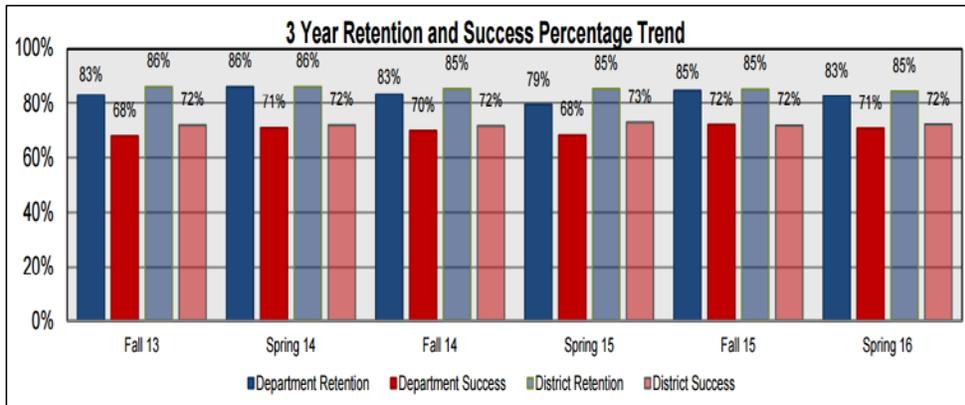- IIT Security Subcommittee

2d) Optional Additional Data: Enter additional data here that you believe to be an indicator of your program's effectiveness and explain why.

3) <u>**Effectiveness:**</u> **This section assesses the effectiveness of the program in light of traditional measurements.**

3a) Retention and Success: Identify and explain the three-year trends in your program's data contained in the DSR. Address separately the data for on ground and on-line course. Evaluate the significance of the trends, including any challenges experienced by the program and any relevant data/analysis from your course and program outcomes assessments. If applicable, please analyze any significant trends related to student equity and success. If you determine that you need to improve the program's performance, please describe how you plan to achieve this goal. Please include the results of your outcomes assessments, as appropriate.

Dashboard and DSR charts show CIS Success and Retention on par with the district average.

3 Year Retention and Success Percentage Trend

	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16
Department Retention	83%	86%	83%	79%	85%	83%
Department Success	68%	71%	70%	68%	72%	71%
District Retention	86%	86%	85%	85%	85%	85%
District Success	72%	72%	72%	73%	72%	72%

Success & Retention (F15/S16)

- Average of Success
- Average of Retention

CIS: Average of Success 71.8, Average of Retention 84.1

District Average

- Average of Success
- Average of Retention

Average of Success 73.1, Average of Retention 86.1

There is no significant difference between the department's online and onground success and retention.

CIS	Fall13	Sp14	Fall15	Spr15	Fall16	Spr16	3YrAvg
Department Retention	83%	86%	83%	79%	85%	83%	83%
Department Success	68%	71%	70%	68%	72%	71%	70%
Online Retention	81%	86%	81%	69%	85%	84%	81%
Online Success	71%	63%	64%	59%	73%	67%	66%

CIS department dashboard demographic data looks very similar to the district, except that in CIS, we have more first generation students and our population is generally older.
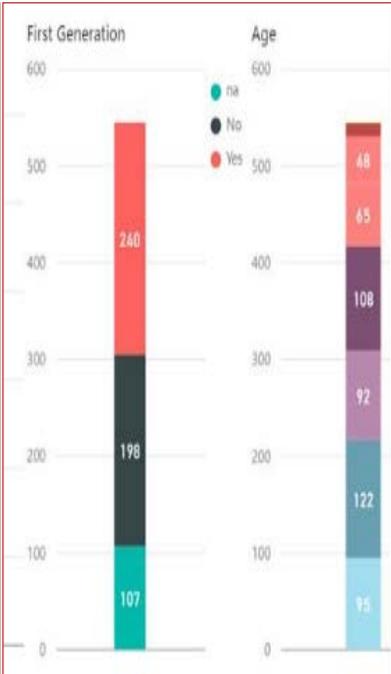
3b) Enrollment Trends: Identify and explain the three-year enrollment trends in your program's DSR data. Address separately the data for on ground and on-line, as well as the data at the various centers in which your program may operate. Evaluate the significance of the trends including any challenges experienced by the program. If applicable, please analyze any significant trends related to **student equity and success**. If you determine that you need to improve the program's performance in any way, please describe how you plan to achieve this goal.

Enrollment Trends: CIS enrollments have increased while district enrollments have fallen. DSR data shows an overall total CIS enrollment increasing, as a result of enrollment increases at the Rocklin campus, and despite some decreases in enrollments at the outlying centers, and a low semester of online offerings.

Enrollment by Location	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	3 Yr Avg
Department Total	682	576	661	595	663	776	659
Roseville Gateway							#DIV/0!
Rocklin Campus	445	357	416	374	471	501	427
Tahoe Truckee	25	19	25	14	20		21
Nevada County Campus	89	96	99	65	76	49	79
Distance Learning	123	104	121	142	96	226	135

Explanation: Some low enrolled courses, at the centers, were discontinued by the centers. When a faulty member retired, another member was temporarily unavailable to teach her usual load of online courses because she took on the Virtual Office courses for a semester.

Plans: Department is interested in making it possible for remote students to participate in Rocklin classroom courses via technology. CIS faculty have made proposals to Ed Tech and Distance Ed committees. With Strong Workforce grant funds, the department plans to pilot use of such technology. To fully implement, this will require district new policies, staffing, and facilities.

3c) Productivity: Comment on how the program contributes to overall district productivity. Evaluate the significance of the trends including any challenges experienced by the program. If you believe the statistical trends need improvement, and can be affected by your actions, If you determine that you need to improve the program's performance in any way, please describe how you plan to achieve this goal.

Trend: Looking at efficiency and corresponding AveSize data, the department trend is flat, while the district's trend is going down.

CIS	Fall 13	Spring 14	Fall 14	Spring 15	Fall 15	Spring 16	3 Yr Avg
FTES	96	81	91	83	88	100	90
FTEF Total	6.9	6.7	7.4	6.8	6.9	8.0	7.1
Efficiency (WSCH/FTEF)	428	370	377	374	397	384	389
Fill Rate	88.3%	76.7%	78.0%	74.0%	81.1%	76.9%	79.2%
AveSize	20.1	18.0	20.0	19.8	21.3	20.9	20.0

Explanation: Some low enrolled courses, at the centers, were discontinued by the centers.

Recent Changes: Effective Fall 16, two classrooms used for CIS classes received an additional workstation. This allows for a very small class size increase to further support efficiency.

3d) Analysis and Planning: Referring to your ePAR Report of Goals, Strategies, Actions, and outcomes assessment cycle and relevant assessments/evaluations, please describe your program's plans to maintain or increase its effectiveness and analyze and evaluate your efforts to achieve these goals.

The department is pleased to have note improvedments in all the above measures when compared to the prior program review.

The department ePAR goals have been:
- Improve student success in CIS courses and programs.
- Revitalize the Information Technology Programs
- Maintain currency in technology and field of education
- Improve Program Outcomes & Assessments
- Market/Promote CIS courses/programs

Improve student success in CIS courses and programs
Evaluation of Efforts:
We are pleased to see that out success rates are better now than they were at the time of our last program review.
- The department has taken steps to work toward making it possible for students at NCC and TT to take classes, taught in a Rocklin classrooms, via streaming media.
  - Spoke with Willie Duncan and followed up by speaking with his contact.
  - Presented at Ed Tech and DLIT committees.
  - Requested funds to purchase equipment.
- Some courses had lab hours, which in the past 5 years were removed in an experiment to see if online services could replace them. Formal

and informal assessments resulted in determining the need to restore some lab hours.

- o CIS65 and 141 lab hours restored – approved 12/16. We expect these changes to take effect in Fall 2017.
- o CIS142 lab hours are still being considered in the curriculum process.
- We have continued to provide support for students in our lower level courses.
    - o Created and piloted new optional supplemental lab courses, CIS30L and CIS50L, and have already implemented some scheduling adjustments designed to increase enrollments. Investigating non-credit.
    - o Scheduled student lab assistants in class to support students. This make the lab assistants in drop in lab hours more effective.
    - o Participating in Pass Peer program starting Spring 17, with at least one Pass Peer Tutor in CIS50.
    - o Did the best we could with the loss of the dedicated Drop-In Lab room, coupled with limited and inconsistent availability of open computer classrooms; but students were frustrated nonetheless.
- CIS completed pathway maps for all degrees and certificates.
    - o Made some adjustments to degrees and certificates to reduce barriers to student success.

Plans:

- Develop streaming course delivery.
- Complete CIS142 curriculum update to restore the lab hour.
- Continue to provide support for students in the classroom and Drop-In Lab via department student help and or Pass Peers.
- Monitor and as needed, rework the supplemental lab classes as non-credit or incorporate the CI30 and CIS30L into one course.
- Continue active involvement with liaison counselor regarding implementation of pathway maps.

Revitalize the Information Technology Programs

Evaluation of Efforts:

Progress has been made and a lot more is needed to prepare student for jobs of the future. The Strong Workforce Initiative project and potential sabbatical by one of our full-time faculty members will make this possible.

- Changed the Networking degree name to Networking and Security.
- Revised both our Networking and Security degree and our Tech Support degree to align with statewide career pathways.
- Updated courses.

- Created a new Cisco course: Routing and Switching.
- Refurnished large classroom, V107, to not only serve as a regular student computer classroom, but to double as a specialized networking lab with a professional server rack as well as workbenches and storage for projects requiring tearing apart computer hardware. This provides better hands-on experiences for students.
-

Plans:

The SWI project will include revitalization of all CIS programs.

- Build stronger advisory partnerships for better information about what is needed.
- Develop a more organized, stronger, larger internship program.
- Update courses and degrees.
- Re-brand the department.

Maintain currency in technology and field of education

Evaluation of Efforts:

The department is keeping up, but needs to do more to prepare student for jobs of the future. The SWI project and potential sabbatical will make this possible.

- Updated classrooms and courses to Windows 10 and MS Office 2016. Reviewed, selected and incorporated new instructional materials and lesson plans, including online Etexts and simulated software environments.
- Updated courses to accommodate changes in industry certifications with which many of our courses align.
- Maintained an active LinkedIn group presence during Fall 2016 semester. A CIS Facebook group, maintained largely by students, was reactivated in Spring of 2017.
- As listed in the professional development section above, the department is very actively engaged in professional development.

Plans:

- Build stronger advisory relationships with industry partners
-

Improve Program Outcomes & Assessments

Evaluation of Efforts:

The department is doing well in this area.

- Completed first 3-year program review cycle with original course and program outcomes.

- Revised all course and program outcomes.

Plans:

- Begin assessing our new course and program outcomes.
-

Market/Promote CIS courses/programs

Evaluation of Efforts:

This has been a priority for CIS. We believe we have strong programs that lead to great careers, and we want to get the word out and fill up our classes. We are pleased that our efficiency has increased since the last program review. In the Fall 2016 semester alone, we did the following:

- Revised our Networking and Tech Support degrees to align with statewide career pathways and to the changed name of Networking and Security. Now, students looking for "cyber security training" will find it in our catalog.
- Worked with Marketing to update web pages for CIS on Sierra's site. Students can now find information about security career preparation there also.
- Developed new print materials for promoting CIS career paths to current and prospective students.
- Participated in Maker Fair.
- Participated in CTE Outreach events.
- Attended Here to Career Conference.
- Maintained an active LinkedIn group presence for Fall 16 semester, via student help.
-

Plans:

- Continue to work with Marketing to improve CIS web pages, develop new print, and other outreach materials.
- Maintain social media presence.
- Re-brand the department.

3e) Optional Additional Data: Enter additional data here that you believe to be an indicator of your program's effectiveness and explain why.

4) **Resources: This category assesses the adequacy of current resources available to the program and describes and justifies the resources required to achieve planning goals by relating program needs to the assessments above. (Refer to the bottom row of your DSR in your response to this category. You may include budget information if you have it.)**

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4a) Please describe the **future** direction and goals of your program for the **next three years** in terms of sustaining or improving program effectiveness, relevance, and currency. Please incorporate analysis of any relevant outcome or other data in this description.

The CIS department will be undergoing a major reorganization project which has been funded through the Strong Workforce Initiative (SWI) taskforce. A large component of the reorganization will be to refine/redesign and clarify the program offerings by having 3 distinct high demand, high wage career paths:

- Business Information Worker
- Big Data / Business Analytics
- Cyber Security

Each of these career building pathways will be built with stackable certificates.

This project brings with it funding through SWI to help with improvements to technology to support delivering content to NCC and TT. This will help to improve efficiencies. These funds cannot be used to replace existing equipment.

SWI project goals include:

- Strengthen and improve advisory board membership and effectiveness
- Develop streaming course delivery options to support NCC and TT students
- Develop partnership with Hacker Lab
- Track industry certification completions
- Increase internship participation
- Increase the number of degrees and certifications awarded
- Update course offerings/degrees to better align with today's industry needs
- Re-brand the CIS department

The SWI project has been approved, but we are waiting to hear about the sabbatical request, which is also required to provide the human instructional resources for this major redesign.

CIS also intends to:

- Maintain social media presence.
- Continue to work with Marketing to improve CIS webpages, develop new print, and other outreach materials.
- Continue to provide support for students in the classroom and Drop-In Lab via department student help and or Pass Peers.

- Monitor and as needed, rework the supplemental lab classes as non-credit or incorporate the CI30 and CIS30L into one course.
- Continue active involvement with liaison counselor regarding implementation of pathway maps.

4b) Equipment and Technology: Comment on the adequacy of the program's equipment and technology funding level for the District as well as for specific sites, including a projection of equipment and technology needs for the next three years. Please provide a justification for these needs, incorporating relevant assessments of the data above in this explanation.

There is a urgent need for 6 updated projectors for Rocklin classroom use.
- Outcome assessments have identified this need.
- The existing projectors, after 7 years of service, are at the end of their usable life span and no longer reflect current shape/color/sharpness/brightness or standard screen size.
- The newer, wider monitors used by our students and instructors do not display properly on the old projectors.
- These outdated projectors are inappropriate for demonstrating best practices for layout and use of color ~~in~~ when working on building webpages, presentations, and other computer projects.
- We need projectors with current projection geometry, true colors, and proper brightness.

Computers need to be updated/upgraded and replaced regularly.
- The department will be requesting updated computer systems for classrooms when the existing computers near the end of their useful life.
- We hope and expect most of the existing systems used in the classrooms to be adequate for the next 2-3 years. However, we have experienced a few systems failing and requiring replacement or significant repair already this year.
-
- NCC and Truckee computer classrooms need significant attention, PT faculty frequently point out how much nicer things are at Rocklin.

4c) Staffing: Comment on the adequacy of your program's faculty, classified, and student help staffing levels for the overall District as well as specific sites, including a projection of staffing needs for the next three years. Please provide a justification for these needs, incorporating relevant assessments of the data above in this explanation.

The SWI project has been approved, but we are waiting hear about the sabbatical request, which is also required to provide the human resources for this major redesign.

After this semester, Spring 17, we expect to have less than ONE full-time faculty member teaching CIS.

- One current full-time faculty member, we hope will be on sabbatical leave.
- One "full-time faculty member" will continue to work part-time on a STRS Reduced Wworkload.
- Two current full-time faculty members will retire from the district this spring.
- One full-time faculty member who started in CIS, but now mostly teaches in another department, will no longer be considered a CIS full-time faculty member.

The department is in need of at least two new faculty members specializing in particular areas of computer technology. We need:

- Networking and Security specialist
- Business Analytics specialist

Currently, the only classified positions supporting CIS are the division office administrative staff.

- Since our division supports a very large diverse group of departments, most of which are also part of the CTE program, these staff members are critical.
- The department requests the district provide the Bus Tech division office all the staff they need.

We are very glad about the new Instructional Assistant position, approved last year to serve DES, CSCI and CIS. Filling this position has been delayed, but when it happens, this will provide critically needed support for the department.

Student workers are ustilized to

- They help in the open lab at the Rocklin campus and in support of student success in the classroom for some sections of our more basic courses.
- Student help is also utilized to manage the department's social media presence.
- The budget for Student Help has been almost adequate for the last couple of years with some supplementation from CTE funds. We hope we can and should continue to becarefully manage and ensure it is adequateso for the next 3 years.

- However, wWith minimum wage going up, an increase in that budget would be welcome.

4d) Facilities: Comment on the program's fill rate and the adequacy of the facilities for the District as well as specific sites, including a projection of facility needs for the next three years. Please provide a justification for these needs, incorporating relevant assessments of the data above in this explanation.

During the last year, the room we have used in the past as a drop indrop-in computer lab for all Sierra students has been taken over for primary use as a classroom.
- Drop-in lab is now limited to a few hours here and there, between existing classes and workshops, and in various room locations.
- Our students no longer have a room available all day and evening to utilize computer equipment and course software and to receive support from lab assistants.
- Not all student populations have equal access to the needed computers, specialized software, and appropriate support at their homes. We see the need for a consistently available Drop-In Lab as crucial to the success of our students.
  -

4e) Please check the appropriate boxes in the chart below indicating the general reasons for the resource requests described above (please check all that apply):

Function/Role	Maintenance	Development	Growth	Safety	Outcomes	Other success measures	No Requests
✔		✔	✔		✔	✔	

5) Summary/Closing

5a) Based on the analysis above, briefly summarize your program's strengths, weaknesses, opportunities, and challenges.

Strengths:
- A good pool of qualified, energetic part-time faculty who are willing to share their knowledge and skills, some who hold very high level Information Technology day jobs.
- Faculty members with many industry-based certifications and a commitment to staying current in an ever changing industry.
- Faculty members who intentionally reach out to better meet the needs of underserved, underprepared students.

- Nice classrooms with good student and instructor workstations, on Rocklin Campus

Weaknesses:
- Without general ed requirements driving our enrollments, the department is at a significant disadvantage relative to other departments, such as English, Math, History, etc.
- As FT faculty have moved out of full time dedication to the department, we have experiences a shortage of human resources to do the work required to maintain and expand the department's success. We lack a FT faculty member with IT networking and security industry experience to provide leadership for this part of our department.
- The classrooms at NCC/TT are subpar.
- The college's lack of automatic award or notification to students that they are near completion of certificates/degrees means that they are not always awarded, when earned.

Opportunities:
- Strong Workforce Initiative funds and potential sabbatical leave will provide an opportunity to invest time and money into rebranding of the department.
- Through SWI and potential sabbatical we have the opportunity to conduct an in-depth examination of industry needs and to ensure that we align curriculum properly with high-wage/high-demand jobs.
- Through SWI and potential sabbatical we have the opportunity to strengthen and form advisory partnerships (Hacker Lab, internships)
- The department sees the statewide effort to include a digital literacy requirement in GE, as a potential opportunity to support both the institution and our students.
- We have seen the need but have lacked human and financial resources to tackle the challenge of collecting student industry certification completions. This is something we hope to address though the Strong Workforce Initiative project.

Challenges:
- It is very challenging to keep counselors up to date about our program.
- The department name and identity pose a challenge. The name is often confused with Computer Science—a different department. Our purpose, role, and identity are not very clear to many on our campus and in our community.

- The loss of a dedicated room and consistent open hours for our Drop In Lab has posed a challenge – students are frustrated by lack of clarity regarding when/where they can count on finding access to needed hardware, software and support.
- Students are not always effective at self-placement – we have lacked human and financial resources to tackle the challenge of creating effective placement assessments into the courses we teach, spanning from beginner computer use to advanced cyber security.

5b) How has the author of this report integrated the views and perspectives of stakeholders in the program?

The input from all faculty working in the CIS department has been gathered through meetings, email exchanges, shared resources and discussions.

Division and campus support staff and administration are included and consulted in the planning and scheduling processes.

Student input was gathered and incorporated and industry representation was included through information gleaned at advisory meetings as well.

Administrators and other campus staff have contributed to the department plans, particularly through the Strong Workforce Development committee and the Sabbatical Leave application process.