FOOTHILL COLLEGE
Program Planning and Review
(650) 949-7240 | http://www.foothill.edu/staff/irs/

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I. Department/Program Mission	
1. State the department name and everyone who participated in creating the comprehensive program plan.	Computer Information Systems (CIS) Department: Computer Science; Computer Software Development; Database Management programs; Informatics Michael Loceff, Elaine Haight, John Berry, Anita Whitehill, LaDawn Meade, Scott Gever, Juanita Croft, Mimi Will, and Judy Baker.
2. State the program's mission. If you don't have one, create one.	**The mission of the Computer Information Systems Department is to develop and provide state-of-the-art, high quality curriculum to prepare students for productive professional careers in computer science and information systems.** Objectives: The Department strives to create a student-centered learning environment that supports: ▪ Preparing transfer students for successful matriculation to computer science, ▪ Training professional workers and technicians, ▪ Training students in current and emerging programming languages and techniques, database development and administration, operating systems, along with basic computer and information literacy. The Department places a high priority on enabling learning for diverse student populations with limited resources.

I. Department/Program Mission

3. Explain how the program/department mission is aligned with the college mission?	Prepares students for career preparation and transition, lifelong learning, transfer education, and acquisition of new skills in the field. Instructors are committed to the success of the Foothill College students.

II. Department and Program Description & Data

1. What are your hours of operation?	Our offices open at: 9 am Closed for Lunch: No ☐ or Yes ☒ If yes, when: 12 to 1pm Our offices closed at: 5 pm			
2. What types of classes do you offer, at what locations, and at what times?	Times offered: ☒Morning (6AM-12PM) ☒Afternoon (12PM-4PM) ☒Evening (4PM-10PM)	Locations offered: ☒FH Main Campus ☒Middlefield ☐Off campus	Types Offered: ☒In Person ☒Hybrid ☒Distance	Status Offered: ☒Credit ☐Non-credit

3. List current positions and descriptions for all personnel in your area on the chart below (include position titles only, not individual names).

Faculty Positions by Discipline	Full-time Headcount	Part-time Headcount	Brief Description of duties
Computer information System (CIS)	6	9	Prepare and deliver lectures, develop curriculum, author part or all of courses for online or hybrid delivery, mentor students as needed, participate in program review, attend division meetings, participate as presenters, participate in shared governance, industry advisory board members, and volunteers at national and international conferences (League for Innovation, CIT, Tech Ed, Technology, Colleges & Community – TCC, Worldwide Online Conference, and Women in Technology International).
Computer Science	1		Prepare and deliver lectures, develop curriculum,

			author part or all of courses for online or hybrid delivery, mentor students as needed, participate in program review, attend division meetings, monitor progress of new languages and write curriculum where appropriate, stay current in three major platforms (Mac, Windows and Unix), participate as presenters, participate in shared governance, industry advisory board members, and volunteers at national and international conferences
General Business	1		Prepare and deliver lectures, develop curriculum, participate as presenters, participate in shared governance, industry advisory board members, and volunteers at national and international conferences
Management and Classified Positions	**Full-time Headcount**	**Part-time Headcount**	**Brief Description of duties**
Dean	1		Provide division leadership, manage budgets, facilitate curriculum processes, supervise staff, assist students/faculty/staff, and coordinate program activities and oversight.
Administrative Assistant	1		Position currently filled through an "out-of-class" assignment, which ends in December. Div. Admin supports 3 distinct functions: CTIS, Apprenticeship, and COOP. Coordinate the day-to-day operations of the office, interacts with the public, students, administrators, faculty and staff. Monitors division budgets and fiscal management process.
Instructional Computer Laboratory Administrator	2		Install, configure, and maintain labs and software for the division; monitor performance and upgrade as necessary; configure and debug network desktop clients. Assure proper operations of computer systems, and other electronic equipment; participate and assist in the research, planning, and formulation of solutions for various technologies; maintain division website; provide evening support. One position provides high-

			end support for our UNIX servers, as well as, our Cisco and VMware instructional labs.
Instructional Associate(s)	1	1	Assist in the instructional program by performing technical work in an instructional learning environment for vocational or academic subject area; exercise judgment and initiative in coordinating lab class programs and other instructional facilities and materials of the assigned learning. Oversee the day-to-day operations of assigned instructional lab.
Laboratory Technician	1		Assist with utilizing lab instruments, materials, and equipment in a safe and proper manner; answer technical questions; tutor students in assigned lab as necessary; demonstrate proper use of equipment and materials. Prepare and set up tools, equipment and materials for demonstrations operate a variety of assigned laboratory equipment.
Student Worker Positions	**Hours per Week**	**Months per Year**	**Brief Description of duties**
CTIS Open Lab Support	20	9	Helping students is their primary focus. Assist students at the counter. Walk around lab offering students assistance; maintain a lab cleanliness and order, Clean keyboards and mice, report malfunctioning equipment, maintain printer and equipment supplies.

4. Given the data, describe the trends in enrollment, FTES, and Average Class size. What are the implications for your department?	In the 06/07 fiscal year, student enrollment (grades) was 2,804 and WSCH was 18,574 with a productivity of 463. In 07/08 fiscal year, student enrollment (grades) rose to 2,828 with WSCH rising to 25,715 and productivity rising to 633. In 08/09 student enrollment (grades) continued to rise 12% to 3,219 with WSCH rising 10% to 28,715 and productivity rising 14% to 739. The department serves both workforce and transfer populations and has showed continued growth for the last three years.
5. Student Achievement: Given the data, describe the trends in overall	In the 06/07 fiscal year, there was a retention rate of 77% and a success rate of 64%. In 07/08, the retention rate rose to 79% and success rate rose 4% to 68%. In 08/09, the

success rates, retention rates, and degrees and certificates awarded. What are the implications for your department?	retention rate continued to rise 80% and the success rate remained the same at 68%. One challenge that has been observed professional students and drops – Late Ws. Certificate completion has not been our population's priority. However, we continue to investigate new ways to encourage student certificate completion (e.g., Database Technology) (Student Course Completion rates by course). In 2007, there were 14 Associate's degree completions in the Greater South Bay and Peninsula region for Computer Science; Foothill College issued 4. In the same year, there were 28 Associate's degree completions in the region for Computer Programming/Programmer, General; 3 degrees were awarded by Foothill College. There were 29 certificates (Awards<2) in the region for Computer Programming; 4 were awarded by Foothill College. 7 Associate's degrees were awarded in the region for System Administration/Administrator; 1 was awarded by Foothill College. There were 11 certificates (Awards<2) in the region for Computer Programming; 1 was awarded by Foothill College. As regional data supports, degrees and certificates are not a priority for our students, given that courses are tied to application-specific skill attainment. There is good growth potential in developing workforce certifications (< 1 yr) for both displaced workers, as well as, continuing education for professionals wishing to expand their skills.
6. Student Equity: Given the data, describe the trends with respect to underrepresented students. How will your program address the needs/challenges indicated by the data?	In comparing 2007/08 (total headcount 2,828) with 2008/09 (total head count 3,219), **retention increased** for Hispanic students by 2 percentage points (74%); for White students by 1 percentage point (81%); and, 14 percentage points for Other students (85%). Student **retention remained the same** for Pacific Islander students (72%). Student **retention decreased** for Asian students by 2 percentage points (81%); for Black students by 4 percentage points (60%); for Filipino students by 16 percentage points (62%). **Black, and Filipino, Hispanic, and Pacific Islander Ethnicity students seem to have a disproportionally lower percentage of student retention.** Percentage of **success increased** 1 percentage point for White students (71%); 35 percentage points for Other students (79%). Percentage of **success remained the same** for Asian students (72%). Percentage of **success decreased** 10 percentage points for Black students (41%); 13 percentage points for Filipino students (44%); 1 percentage point for Hispanic students (55%); and 18 percentage points for Pacific Islander students (59%). Percentage of **non-success decreased** for Asian students by 2

	percentage points (9%); 3 percentage points for Filipino students (18%); 21 percentage points for Other students (5%). Percentage of **non-success remained the same** for Pacific Islander students (14%). Percentage of **non-success increased** 6 percentage points for Black students (19%); 3 percentage points for Hispanic students (19%); and 1 percentage point for White students (10%). Ethnic groups, other than Asian, are not well represented in current CIS Programs. Other underrepresented students include those with handicaps such as hearing impaired, visually impaired and physically impaired. The division as a whole has been and will continue to be looking to better identify barriers opposing student success. Online courses are particularly useful in helping underrepresented students. Transportation and proximity to campus are not relevant in this context. Many students who receive financial aid require accommodations and participate in special vocational programs to make use of courses, especially hybrid and online, because this modality allows individualized attention and flexible hours. Some underrepresented students must drop online courses because the written communication demands are higher than in face-to-face classes, and they are directed to the campus classroom option when this happens. We will be developing a survey instrument that will seek to identify challenges, needs, and opportunities in raising student success and retention.
7. Given the data, discuss how the FTEF trends and FTEF/FTES ratio will impact your program. Include any need for increasing or reducing your program faculty. What are the implications for your department?	In 2006/07 fiscal year, Full-time FTEF was 5.97 and PT/Overload was 5.42. In 2007/08 fiscal year, Full-time FTEF was 6.68 and PT/Overload was 4.59. In 2008/09, Full-time FTEF was 6.88 and PT/Overload was 3.93. In 2002, there were 108,264 jobs in the Greater South Bay and Peninsula region for the following occupations: computer and information scientists, research, computer programmers, computer software engineers (applications), computer software engineers (systems software), computer support specialists, computer systems analysts, database administrators, network and computer systems administrators, network systems and data communications analysts, and computer specialists (all other). It is anticipated that there will be a 41% increase in jobs by 2019, which translates to 44,386 new jobs (152,650 in total) (Source: EMSI Complete Employment - 3rd Quarter 2009). Given consistent growth in enrollment, WSCH, productivity, and job demand, the Division will be seeking an additional full-time faculty position that is broadly defined with a wide skill set so that the new member can contribute to several CTIS departments.
8. Given the data for distance learning, describe the trends	In the 06/07 fiscal year, Distance Education student enrollment (grades) was 2,050 and WSCH was 11,881 with a productivity of 516. In the 07/08 fiscal year, Distance

related to success, retention, and student satisfaction. Discuss solutions to ensure that rates match or exceed those of comparable traditional format courses.	Education student enrollment (grades) increased to 2,198 and WSCH increased to 20,015 with a productivity of 731. In the 08/09 fiscal year, Distance Education student enrollment (grades) increased 14% to 2,554 and WSCH increased 12 % to 22,721 with productivity increasing 14% to 848. In 06/07, retention was 75%. In 07/08, retention increased to 78%. In 08/09, retention remained the same at 78%. Student success for 06/07 was 61%; in 07/08, the success rate increased to 66%. In 08/09, the success rate continued to increase to 67%. As mentioned previously, many CIS courses are taught in an online modality. Student retention has improved in the past few years as we have evolved in this modality. Due to years of experience with the course management system (CMS) delivery, our faculty is able to provide extensive personal, written assistance on a timely manner with students from both the low and high end of the spectrum. Using CCCConfer, special group meetings are convened when needed, often integrated into the existing CMS for simplicity. Students are becoming more familiar with the online format and the number of first-week drops, which indicated students thought the online delivery would be easier than face-to-face classes, is falling, indicating a more realistic expectation on the part of the student. Our courses have been taught online for longer and with greater frequency than most other departments, providing a large amount of data from which to mine for trends. Student course evaluations have confirmed that these courses are satisfying and effective for helping students move to the next level, whatever their educational goals.
9. Optional: Provide any additional data relevant to your program. (Indicate the source of the data).	Santa Clara County 2006-2016 (San Mateo very similar) The 50 occupations with the most job openings are forecasted to generate about 167,100 total job openings, which is about 54 percent of all job openings. Included in the top three occupations are computer engineers, which require a bachelor's degree and pay about $52 per hour. The other two occupations are Retail Salespersons and Waiters and Waitresses; they require short-term on-the-job training and pay from about $9 to $11 per hour. Higher-skilled occupations, requiring an Associate's degree or higher, include Computer Software Engineers, Computer Hardware Engineers, Computer Systems Analysts, and Network Systems Analysts. The 50 fastest growing occupations anticipate a growth rate of 15 percent or higher during the forecast period. Occupations in the computer field require a bachelor's degree or higher and pay hourly wages ranging from about $39 to $62. The occupations in high-wage categories are Research Computer Scientists, Pharmacists, Computer Software Engineers, and Biomedical Engineers.

	(Employment Development Department [EDD]. 2009. *2006 – 2016 Santa Clara and San Benito Counties Projections Highlights*. http://www.calmis.ca.gov/file/indproj/sjos$_highlights.pdf)
10. Are you seeing trends that are not reflected in the data cited above? If yes, please explain.	"Increasingly, jobs require advanced technological know-how, creative problem-solving abilities and superior communication skills. However, the high level of education needed for these positions is becoming financially out of reach for a growing number of Americans. Employers will be forced to create their own degree programs to develop potential future employees. Companies have already seen the benefits of tuition assistance in terms of recruiting, training and retaining workers. Organizations will initiate entire programs with precise coursework centered on their company culture and goals, eliminating the need for extensive on-the-job training, and saving both the company and workers thousands of dollars. Future students will hold degrees in things like Web Design from Microsoft College or Virtual Community Relations from Google University. Large employers such as IBM have already instituted courses specifically tailored to their needs. This will become more widespread as companies look for better ways to develop a well-trained workforce". http://www.jobjournal.com/article_full_text.asp?artid=2384

Summary of Planning Goals & Action Plans				
11. Identify 3-6 operational goals and link them to one or more college strategic initiatives or to your operations.				
Department Operational Goals	**College Strategic Initiatives**			
Identify 3-6 operational goals	Building a Community of Scholars	Putting Access into Action	Promoting a Collaborative Decision-making Environment	Operations Planning
Retire outdated curricula and create new relevant courses.	☒	☐	☐	☒
Identify problem areas for underrepresented populations.	☐	☒	☐	☐
Improve transfer success.	☐	☒	☐	☐
Establish strong career and academic pathways.	☒	☐	☒	☐
Improve our ability to meet current and future industry demands.	☒	☐	☐	☐
12. What is your plan for accomplishing your goals?				

Department Operational Goals	Activities	
Retire outdated curricula and create new relevant courses.	Retired 15 courses in Fall 2009.	
Identify problem areas for underrepresented populations.	The Division shall develop a survey to solicit feedback on student challenges and barriers.	
Improve transfer success.	We are developing new versions of some advanced courses (CIS 15C and CIS 27C) for online delivery that conform to the requirements of UC, Stanford, and Cal State.	
Establish strong career and academic pathways.	Scheduling better sequence offering for degrees and certificates so that online students can complete curricula online and evening students can complete curricula in evenings.	
Improve our ability to meet current and future industry demands.	**Computer Science:** Offering courses on new popular languages (Python, Ruby, C#, etc.).	

13. Are additional resources needed to accomplish your department operational goals? If yes, identify the resource, as well as the purpose and rationale for each resource.

Identified Resource	Purpose	If requesting funding, provide a rationale of how each request **supports one or more college strategic initiative and/or supports student learning.**
Instructional Expert (IE) for faculty support	The popularity of online courses exposes the student expectations and demands on instructor for 24/7 support. The role of a support faculty, called an Instructional Expert (IE), who can serve to assist three or four courses across different faculty is indicated.	When this has been tried, students consistently respond positively both in feedback and retention. A regular and permanent allocation for an IE is needed to continue to grow our online offerings and fill the gaps in a world where students are online all hours of the day and night and expect assistance in a timely manner.

III. Curriculum	
Curriculum Overview	
1. How does your curriculum address the needs of diverse learners?	Our curriculum offers different levels, speeds, and intensity of courses and different levels of complexity. We offer delivery for different learning styles such as visual, auditory, kinesthetic, etc.. Students can choose between day and/or night classes, and online classes, which helps students overcome differing learning challenges.
2. How does your curriculum respond to changing community, student, and employer needs?	Industry Advisory committee, guest speakers, outreach, community events (Code Camp), updating courses on a constant basis. **Database:** Curriculum has recently been revised to meet changing industry needs in the following ways: 1. Every Oracle Database Administration course has been rewritten to reflect the changes in the latest version of Oracle. The certificate program for Oracle Database Administration has been modified to correspond to the Oracle Certified Professional Certificate. 2. Two Oracle Developer courses have been rewritten to reflect the changes in the latest version of Oracle. 3. Several students who have completed the Oracle courses at Foothill College passed the OCP exams given by Oracle Corporation. 4. A new course in CRM skills certificate has been written. This is the first course in the new CRM Skills Certificate, which is going to be offered starting Fall 2009. 5. Technology was upgraded to the latest version of Oracle in classroom and computer lab computers. 6. Ruby on Rails is included as one of the courses in the Open Source Database Skills Certificate.

3. How does your curriculum support the needs of other certificates or majors?	Computer literacy and critical thinking.
4. Do your courses for the major align with transfer institutions?	Yes – CSUEB, SJSU, USSC, NHU, Notre Dame de Namur.
5. Do your courses have appropriate and necessary prerequisites? Identify any challenges and plans to address the challenges.	Advisories – given the nature of our student population. Reinforce the advisory concept by offering early material. Promote empowerment in the feeling of responsibility by students.
6. Review the attached curriculum report for currency. What is your plan to address the deficiencies? (Consider: Title V, course deactivation, updated prerequisites, cross-listed courses, measuring student learning outcomes, curriculum sheets, certificates and degrees).	COR development is ongoing, both in new courses and updating existing courses often.
7. Does your program offer distance education courses?	Yes
8. If you offer distance education courses, list one or two short examples of how your distance education courses provide for effective interaction between students and faculty.	Faculty participate in online discussions and respond to email and private messages in a timely manner. Because of this, students do not have to wait for faculty office hours for individualized attention.
9. If you offer distance education courses, list one or two short examples of how your distance education courses provide for effective interaction among students.	Online discussions enable students to actively participate with other students. Several CIS courses also encourage or require group work for class projects.
College Skills (Pre-collegiate) Overview (Data Available Fall 2009-filling out this section is optional)	
10. What college skills should a student have before entering your program?	HS algebra, reading, writing, critical thinking, ability to communicate in basic English. Some programs within our department require established computer literacy, with exception of programs designed for computer literacy.
11. Given the data, comment on the effectiveness of the assessment and placement of college skills students into your program. (For MATH, ENGL and ESL only).	Students who have performed well in MATH 103 or 105 tend to perform well in CIS courses.
12. In what ways are you addressing the needs of the college skills students in your program?	Pacing of the course, encouraging student collaboration and group activity, one-on-one instructor/student interaction.

13. How are faculty in your program collaborating with other disciplines and services to meet the needs of college skills students?	We have several courses that are cross-listed with other disciplines, including Math and Business. We are currently pursuing a new cross-discipline program in Allied Health Information Systems.	
Program Mapping		

14. f applicable, identify any sequence of courses that are part of your program. List in the order that they should be taken by students.	**Linux:** The following courses should be taken in this order: CIS 68A, 68B, 68C1, 68C2 **C++:** CIS 15A, 15B, 15C **Java:** CIS 27A, 27B, 27C **Oracle Database Administration:** Recommended that the student take CIS 52A and CIS 52C prior to beginning this sequence. CIS 52B Oracle: SQL (5 units), CIS 52E Oracle Database Administration I (5 units) CIS 52F Oracle Database Administration II (5 units) **Oracle Database Developer:** Recommended that the student take CIS 52A and CIS 52C prior to beginning this sequence. CIS 52B Oracle: SQL (5 units), CIS 52J Oracle: Programming with PL/SQL (5 units) CIS 52K Oracle Forms Developer: Build Internet Applications (5 units) **Open Source Databases:** Recommended that the student take CIS 52A and CIS 52C prior to beginning this sequence. CIS 52N PHP & MySQL (5 units), CIS 52Q MySQL: In Depth (5 units) CIS 52P PHP Programming (5 units) **Microsoft Certified IT Professional (MCITP) Database Administration:** CIS 54C Microsoft SQL Server Database Design (5 units) CIS 54D Microsoft SQL Server 2005 (5 units) CIS 54E Microsoft SQL Server Database Administration (5 Units)
15. For your courses that are part of a sequence – are the student learning outcomes well aligned with the next course in the sequence? Please work with the college researcher to answer this question - once your sequence of courses is identified.	Yes.

16. If applicable, describe any capstone course, signature assignment (project, service learning, portfolio), or exam that demonstrates knowledge, skills, and abilities, indicating successful program completion?	**Programming:** CIS 78 Software Engineering Students work in teams to develop a software product from start to finish including choice of features, UI design, implementation and test. **Database:** CIS52P: students will do a project to demonstrate what they learned in CIS52N, CIS52Q and CIS52P, CIS52C: students design a database from scratch	
Course Scheduling & Consistency		
17. Given available data, describe the trends in the scheduling of morning, afternoon, and evening classes, as well as Friday, weekend, and distance education classes. Comment on the feasibility of offering classes at non-standard times.	We discuss and implement differing approaches to enhanced scheduling. We continually need to discuss and adjust schedules to a rapidly changing student dynamic. We must be cognizant of diverse student learning styles and preferences. We coordinate with each other to identify other course offerings/sections that may be better suited for student learning style.	
18. Are required courses scheduled in appropriate sequence to permit students to complete the program in the prescribed length of time? If yes, describe the rationale upon which the sequence is based. If no, what is the plan to change the scheduling pattern? What are the barriers that prohibit implementation of the changes? Explain.	Given population diversity and economic uncertainty, we continually adjust our schedule base upon community feedback. We try to schedule beginning classes every quarter, but have difficulty filling the face-to-face sections in Winter and Spring quarters.	
19. How does the department determine that classes are taught consistently with the course outline of record?	Instructor evaluations and course syllabi are reviewed quarterly, and CORs are now reviewed annually.	
Summary of Planning Goals and Action Plans		

20. What are your goals with respect to curriculum and how will those goals be measured?	Have a department meeting once a quarter BEFORE the schedule is due, so we can discuss the sequences and modalities of our courses. The department will also create a curriculum development project plan that will identify tasks needed for new and existing courses, as well as, timelines for completion.	
21. Are additional resources needed to accomplish your curriculum goals? If yes, identify the resource, as well as the purpose and rationale for each resource.		
Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**
Additional internship positions	The need for more internship positions, particularly in the database areas, for students who have completed a Foothill College certificated program and who have passed the certification exams.	This supports the strategic initiative of training professional workers and technicians. Experience is a key component of any resume and internships give real industry experience to enhance classroom learning.
Increased marketing efforts for new programs	New programs need more exposure, in particular, the Microsoft Database Administration Skills Certificate program.	Because new programs compliment emerging technologies, ensuring their success will assist students in career preparation and transition, lifelong learning, and acquiring new skills in the field.

IV. Learning Outcomes

Student Learning Outcome and Program Learning Outcomes Assessment

1. Be sure and complete your **course-level student learning outcomes** assessment for each course through the C3MS system.
2. **Program Learning Outcomes** in this section will be updated annually and posted on the Learning Outcomes webpage.

• **Intended Program Outcome 1**: *What will the student think, feel, know or be able to do as a result of this educational experience.* Based on a given set of guidelines for a product or application, produce program specifications, a successful student in this program will be able to create and debug code for those specifications and write comprehensible documentation.

This Program Learning Outcome meets the Core College Mission of:	Basic Skills ☐	Transfer ☐	Workforce X
Relationship to Institutional Learning Outcomes • *Communication* • *Computation* • *Critical Thinking* • *Community and Global Consciousness*	Means of Assessment/Criteria for Success *What are the criteria for success? What tools will be used to establish and measure success?*	Summary of Data: October 2011 *Summarize the findings. How close were the results to the criteria for success?*	Use of Results: October 2011 *What do the data tell us about our process? What, if anything, do we need to do to our program or department to improve? What resources are necessary?*
• *Communication* • *Computation* • *Critical Thinking*	The program relies on cumulative knowledge. For example, CIS 15C cannot be passed easily by a student with a B- or C+ in CIS 15A and/or CIS 15B. Students who barely make it through the early courses need to audit/repeat the early courses to succeed in the later ones, confirming that we are constantly retesting the basic skills. Therefore, the topics and projects contained in the advanced core courses are	My CIS 27C students had numerous and extensive projects to do that exercised every skill in the earlier courses. As a result, several students who had not taken the earlier courses at Foothill, but took them from other universities, either dropped out or did not do well. Students who took my 27A and 27B did better as a whole. The attrition was about 45% overall, but closer to 20% within the matriculated students (it is still a hard course, even for students	It seems to be working. We are monitoring all this through SLOs and the changes we have made (and may make in the future) is taking us from good to better.

	designed to make sure that students have a functional understanding of the earlier core courses. Also, topics or special projects courses provide tasks and projects that test the student's ability to exercise the many skills of the core courses.	who were only B students in the earlier courses, thus, we still get drop-outs.)	
• **Intended Program Outcome 2**: *What will the student think, feel, know or be able to do as a result of this educational experience.* A successful student in this program will be able to demonstrate a comprehensive understanding of language tools by synthesizing and integrating multiple language constructs in a single project.			
This Program Learning Outcome meets the Core College Mission of:	Basic Skills ☐	Transfer ☐	Workforce X
Relationship to Institutional Learning Outcomes • *Communication* • *Computation* • *Critical Thinking* • *Community and Global Consciousness*	Means of Assessment/Criteria for Success *What are the criteria for success? What tools will be used to establish and measure success?*	Summary of Data: October 2011 *Summarize the findings. How close were the results to the criteria for success?*	Use of Results: October 2011 *What do the data tell us about our process? What, if anything, do we need to do to our program or department to improve? What resources are necessary?*
• *Communication* • *Computation* • *Critical Thinking*	The program relies on cumulative knowledge. For example, CIS 15C cannot be passed easily by a student with a B- or C+ in CIS 15A and/or CIS 15B. Students who barely make it through the early courses need to audit/repeat the early courses to succeed in the later ones, confirming that we are	to be done Fall 2011	to be done Fall 2011

	constantly retesting the basic skills. Therefore, the topics and projects contained in the advanced core courses are designed to make sure that students have a functional understanding of the earlier core courses. Also, topics or special projects courses provide tasks and projects that test the student's ability to exercise the many skills of the core courses.		

• **Intended Program Outcome 3**: *What will the student think, feel, know or be able to do as a result of this educational experience.*
A successful student in this program will look at a problem and zero-in on the best architecture for the job based on the intended use of the program.

This Program Learning Outcome meets the Core College Mission of:	Basic Skills ☐	Transfer ☐	Workforce X
Relationship to Institutional Learning Outcomes • *Communication* • *Computation* • *Critical Thinking* • *Community and Global Consciousness*	Means of Assessment/Criteria for Success *What are the criteria for success? What tools will be used to establish and measure success?*	Summary of Data: October 2011 *Summarize the findings. How close were the results to the criteria for success?*	Use of Results: October 2011 *What do the data tell us about our process? What, if anything, do we need to do to our program or department to improve? What resources are necessary?*
• *Communication* • *Computation* • *Critical Thinking*	The program relies on cumulative knowledge. For example, CIS 15C cannot be passed easily by a student with	to be done Fall 2011	to be done Fall 2011

	a B- or C+ in CIS 15A and/or CIS 15B. Students who barely make it through the early courses need to audit/repeat the early courses to succeed in the later ones, confirming that we are constantly retesting the basic skills. Therefore, the topics and projects contained in the advanced core courses are designed to make sure that students have a functional understanding of the earlier core courses. Also, topics or special projects courses provide tasks and projects that test the student's ability to exercise the many skills of the core courses.		

• **Intended Program Outcome 4**: *What will the student think, feel, know or be able to do as a result of this educational experience.*
A successful student in this program will demonstrate proficiency in using data analysis, visualization and knowledge management tools, utilize systems design and analysis approaches to problem-solving, apply scientific method to research design and analysis, design and construct appropriate databases, select and use appropriate statistical methods, communicate effectively via spoken word, print and media and work collaboratively and ethically in teams, projects, etc.

This Program Learning Outcome meets the Core College Mission of:	Basic Skills ☐	Transfer ☐	Workforce X
Relationship to Institutional Learning Outcomes • *Communication* • *Computation* • *Critical Thinking* • *Community and Global Consciousness*	Means of Assessment/Criteria for Success *What are the criteria for success? What tools will be used to establish and measure success?*	Summary of Data: October 2011 *Summarize the findings. How close were the results to the criteria for*	Use of Results: October 2011 *What do the data tell us about our process? What, if anything, do we need to do to our program or department to*

		success?	*improve? What resources are necessary?*
• *Communication* • *Computation* • *Critical Thinking*	The program relies on cumulative knowledge. For example, CIS 15C cannot be passed easily by a student with a B- or C+ in CIS 15A and/or CIS 15B. Students who barely make it through the early courses need to audit/repeat the early courses to succeed in the later ones, confirming that we are constantly retesting the basic skills. Therefore, the topics and projects contained in the advanced core courses are designed to make sure that students have a functional understanding of the earlier core courses. Also, topics or special projects courses provide tasks and projects that test the student's ability to exercise the many skills of the core courses.	to be done Fall 2011	to be done Fall 2011

V. Departmental Engagement	
1. What standing committees, if any, does your department maintain? What are the committee charges and membership?	Advisory Committee, Committee for Online Learning (CIS Subcommittee to COOL)
2. What interdepartmental collaboration beyond college skills has your department been involved in during the past 4 years?	Committee for Online Learning (COOL)
3. What has your department done since its last program review to establish connections with schools, institutions, organizations, businesses, and corporations in the community?	Partnership with various institutions to coordinate CIS degree with their four-year program. DigiPen Institute (Computer Gaming University in Redmond, WA).
4. In what ways if any, are you or have you worked with area high schools to align curriculum from the high school to your course?	We are currently engaged in the second year of a program with Palo Alto High School that incorporates online classes with HS curricula in order to prepare students for our CIS degree program. Our goal is to expand this program to other high schools. CTIS participates in The Silicon Valley Information and Communication Technology Collaborative (SVICT) which was formed by Santa Clara Unified School District (SCUSD, K-12), Santa Clara Adult Education (SCAE), Central County Occupational Center/ROP (CCOC/ROP), Foothill Community College, and Ohlone Community College, North Valley Workforce Investment Board (NOVA WIB), Work2Future WIB, EDD, Cisco Systems, and Mastermind Education Inc. in order to provide information and communication technology education and career awareness education to K-14 students and adults in the greater Silicon Valley area. CTIS also participated in The Silicon Valley CTE Community Collaborative (SVCC) which is a consortium of CTE partners in the Northern Santa Clara County region, focused on improving coordination of services and developing a seamless delivery system for career and

	technical education and workforce training. The newly formed collaborative determined in its first three months that the CTE Community Collaborative Project grant would be an excellent tool in its quest to integrate CTE courses, activities and professional training for overall improved program quality and effectiveness. The Silicon Valley CTE Community Collaborative (SVCC) has identified the need for improved coordination and well developed pathways for career exploration and job training in a seamless system from 7th through 14th grades in the Foothill-De Anza Community College District coverage area.	
5. In what ways if any, are you working with CSUs, UCs, private, or out-of-state institutions to align courses and develop articulation agreements?	The department developed/coordinated articulation agreements with UC, CSU, and K-12 systems. Provided program and curriculum review for the National Hispanic University.	
Summary of Planning Goals and Action Plans		
6. What are your goals with respect to departmental engagement and how will those goals be measured?	To complete the Career Pathway Program (CPP) program that was begun with programming courses at Palo Alto High School and will be extended it to other high schools in the area. To extend our reach beyond the local area through online courses so that we may serve students in hard-to-reach locales. The department shall also seek out innovative joint projects that will help establish and promoted academic and career pathways through articulation and internship opportunities.	
7. Are additional resources needed to accomplish departmental engagement goals? If yes, identify the resource, as well as the purpose and rationale for each resource.		

Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**	

VI. Professional Development	
1. List a sampling of professional development activities that faculty and staff have engaged in during the last two years.	Code Camp, NSF ATE Conference, League for Innovations Conference, Google I/O, Web 2.0
2. What opportunities does your department take to share professional development experiences with colleagues?	This is an area in which the department can improve upon. Some faculty have developed blogs to help share information with other faculty (e.g., Elaine Haight's Blog, http://elainesoutdooradventures.blogspot.com). The division shall host once a quarter a Faculty Forum, where faculty will be brought together to share professional development experiences, best practices, classroom management techniques, as well as, student retention strategies.
3. In what ways have faculty shared, discussed, and used professional development activities to improve program effectiveness?	Faculty members have used information presented at various conferences for new course development (e.g., Python).
4. In what ways have staff shared, discussed, and used professional development activities to improve program effectiveness? What professional development needs do you have in the coming years?	Faculty members have taken courses, attended seminars and conferences on a regular basis. For example, Michael Loceff took several courses in online instruction over the past years and attended Tech Ed 2003, 2005, 2006. Elaine Haight created new courses in Python and Ajax, as well as developed scenarios for student experiential learning.
5. Are there unmet or upcoming professional development needs among faculty in this program? If yes, then please explain a proposed plan of action for addressing this need and any necessary resources.	Our subject matter changes much more quickly than that of other divisions on campus. Most of us must spend copious amounts of unpaid time in order to keep up with the current ICT (Information and Communication Technologies). When we don't have time for this, we must hire adjunct faculty who often do not provide the level of professionalism that we strive for. It would much improve our programs if we got release time for professional development.
Summary of Planning Goals and Action Plans	
6. What are your goals with respect to professional development and how will those goals be measured?	Maintaining instructor and curricular currency.

VI. Professional Development

7. Are additional resources needed to accomplish professional development goals? If yes, identify the resource, as well as the purpose and rationale for each resource.

Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**

VII. Support Services

Support Services

Consider the support services needed by your program when reflecting over the following questions		Comments or explanations of barriers and solutions.
1. Is there adequate clerical or administrative support for this program?	**Yes** | No	Yes, currently, but we have concerns for the future as budget cutbacks are implemented for 2010-2011.
2. Are there sufficient college and departmental computer labs available to support this program?	Yes | **No**	We need more classrooms with computers. Our computerized classrooms have become increasingly impacted by other non-CTIS programs. Availability is a real issue.
3. Are the library and media resources provided by the college sufficient to support up-to-date program instruction?	Yes | **No**	Safari U - establishing eTextbooks for current course. We also need updated software licenses.
4. Are adequate services provided in compliance with program needs for meeting health and safety guidelines?	**Yes** | No	Yes – computer labs are straightforward to maintain
5. Are the custodial services to this program in compliance with program needs for meeting health and safety guidelines?	**Yes**| No	Yes - computer labs are straightforward to maintain
6. Are accommodations for students with disabilities adequate, including alternative media, testing, and tutorial?	**Yes**| No	Yes – media center is ADA compliant (as is FGA).

7. Are general tutorial services adequate?	Yes | **No**	Although we have instructional associates and students can provide assistance in basic computing, we have a real need for tutors who have experience in our more advanced courses. In order to raise student retention, tutors are especially needed for C++, Java programming, PERL programming, and advanced database development.
8. Are academic counseling and advising services available and/or adequate to support students enrolled in the program?	**Yes**| No	Yes -- adequate services, but enhanced services are desired as we would like to provide more program and career pathway information/guidance for our students.
9. Do students have access to and can they effectively use appropriate information resources?	**Yes** | No	Students access information resources via the CTIS/KCI multimedia lab or from off-campus using the CTIS website and web resources.
10. Specifically related to distance learning, do you have appropriate faculty support services and/or effective training for faculty teaching online?	**Yes** | No	Faculty have used the instructional designer from Foothill Global Access for support in this area.
Marketing & Outreach		
11. What impact do you feel the college catalog, class schedule, and online schedule of classes have on marketing your program? Does the marketing accurately reflect your program, requirements, and services available?	Online schedule of classes has the most impact on marketing our program - the biggest increase in enrollment is seen in students who come to us through our website and enroll in online courses.	
12. What impact does the college or departmental website have on marketing your program?	The college website is partially effective in marketing our department. Its design has improved in recent years, but there is room for improvement. A continuous feedback loop that allows the department to suggest changes to the college website and online marketing must be established and maintained.	

13. Is there any additional assistance from marketing that would benefit your program? If yes, explain.	It would be helpful if we could get the email addresses of students who have taken the prerequisites for classes we are about to offer, so we could send an email announcement directly to them. For example, it would be great to have constantly updated, separate email lists of students who have taken: ▪ beginning programming ▪ HTML and Javascript ▪ UNIX
14. If you were to collaborate with the Outreach staff, what activities would be beneficial in reaching new students?	It is important for the College to be able to educate potential students as to real career opportunities that exist. There is a great deal of misinformation. If we can better educated students on career and academic pathways, then there will be a chance for greater student focus which should result in higher student retention and program completion.
Programs, clubs, organizations, and special activities for students	
15. List the clubs that are designed specifically for students in this program. Describe their significant accomplishments.	The students have organized a local Association of Computing Machinery (ACM), which has about 60 members. The effort has been mostly student-driven. There are untapped possibilities in having students compete both locally and nationally. The division has provided an opportunity for Foothill ACM students to meet with the San Jose State Computing club. Joint activities should be further encouraged.
16. List any awards, honors, scholarships, or other notable accomplishments of students in this program.	We have had success with the Bruce Swenson scholarship. Several of our high-achieving students were nominated and awarded small stipend/prizes for excellence in academics. We have recently instituted the McIlhiney/Harvey scholarship.
Summary of Planning Goals and Action Plans	

17. What are your goals with respect to support services and how will those goals be measured?		Research and implement upcoming areas in which new clubs might enhance student involvement (Computer Game Programming, Security Encryption, Web Programming, etc.). Create a larger Web presence for the program that integrates with the College Web marketing strategy.
18. Are additional resources needed to accomplish your support services goals? If yes, identify the resource, as well as the purpose and rationale for each resource.		
Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**

VIII. Career and Technical Education Programs

Response to Labor Market Demand

1. How does your program meet labor market demand? Cite specific examples and sources.	As mentioned earlier, there were 108,264 jobs in the Greater South Bay and Peninsula region for the following occupations in 2002: computer and information scientists, research, computer programmers, computer software engineers (applications), computer software engineers (systems software), computer support specialists, computer systems analysts, database administrators, network and computer systems administrators, network systems and data communications analysts, computer specialists (all other). It is anticipated that there will be a 41% increase in jobs by 2019, which translates to 44,386 new jobs (152,650 in total) (Source: Economic Modeling Specialist, Inc. [EMSI] Complete Employment - 3rd Quarter 2009).

2. Given the number of enrollments projected for the program and necessary to support the program, are there enough openings locally to permit placement of the expected number of graduates?	It is very difficult to tell in these fast-changing economic times. However, many of the skills taught within the CIS department are used across multiple vocations. A 10% growth is anticipated over the 08/09 level, which would be 3,541 student enrollments (grades). The regional (Greater South Bay and Peninsula) 2008-13 average annual openings for computer programmers are 538. The average for same period at the state-level is 1,265 (Source: EMSI Complete Employment, 3/2008). In 2008, there were 16,780 computer programming jobs in the region. It is anticipated that by 2013 there will be 2,692 new and replacement jobs. In 2008, there were 5,475 jobs in computer programming services in the region. A 12% growth rate is anticipated by 2013. In 2008, there were 3,905 jobs in computer systems design services in the region. A 12% growth rate is also anticipated by 2013 for this group. In 2008, there were 21,376 jobs in computer systems analysts in the region. By 2013, 6,273 new and replacement jobs are anticipated for this group. (Source: EMSI Complete Employment, Spring 2009). There is already a large demand for skilled professionals in this area.

3. Has the job market been: declining slowly? steady? growing slowly? growing rapidly? newly emerging?	The industry has suffered significant job loss over the past few years. There are several new and emerging technical areas in which CTIS program can support. CTIS **programming** courses have struggled to stay current as a plethora of new languages including Python, Ruby on Rails, AJAX, Silverlight, and others continue to appear, gain attention, and then fade into the diverse foundation of programming tools. CTIS full-time and adjunct faculty have worked hard to start courses, integrate them into the mix of C+/Java and other CIS curriculum. Adding to the challenge of staying current is 'the long-tail' phenomenon, where only a handful of people will have long-term interest in a new programming technology, so we end up targeting a mosaic of student needs. **Database technologies** have historically been confined to tools (Access, SQL, Oracle) and process; database programming, data mining, and database administrator) Under the new informatics certificate is included data management – including aggregation, labeling, cleansing, categorization, storage, retrieval, and both text and data mining. Whether database technologies are a specialization within informatics, or informatics becomes a practice within database tools, it is clear that the two fields are converging. Additionally, Web 2.0 tagging, semantic tagging, and the field of Web metadata are increasingly looking like database tools. Navigation of meta databases (Freebase and Metaverse) OWL (Web Ontology Languages) including pivot browsing tools is an increasingly expanding area of activity. **Mobile computing** - (IDG report) - IDC forecasts show that over the next four years the number of people accessing the Internet using mobile devices will grow by a factor of three, from 40% of the population using the Internet to 70%.

	This great untethering of the user base will be accompanied by a similar untethering of the workforce. "If you have anything to do with managing IT resources in an enterprise, this is going to be one of your biggest challenges over the next few years." says John Gantz, IDC's Chief Research Officer, "Retooling IT for a Mobile Workforce: The Importance of Automation is available at http://www.accelacomm.com/jaw/concib-idgc36/46/50553673/courtesy of IDG Connect.	
4. What is the average starting salary a student can expect to make after completing a certificate or degree?	The median hourly earnings for computer systems analysts is $38.27, for computer programmers is $36.31, for network and computer systems administrators is $33.90, and for database administrators is $38.48. (Source: EMSI Complete Employment, Spring 2009).	
5. What is the projected average percentage of salary increase in 2 years? 4 years?	Given current market volatility, it is very difficult to forecast, or even expect, significant salary increases over the next 2-4 years.	
Response to Program Credibility/Viability		
6. If advanced degrees are typically needed for career advancement, will the courses required for this program transfer towards completion of the requirements for those degrees?	Yes. Our programs are directly mapped with several Computer Science programs within the UC, CSU, and private universities. We have a close relationship with UC Santa Cruz, San Jose State, and Notre Dame de Namur.	
7. If yes, are the courses in your program aligned and/or articulated with the four-year institutions.	Yes.	
8. Will this preparation permit students to stay current in their field? Does the program teach basic principles and theory, as well as applications? Is it current? Is it of sufficient rigor to assure the capacity to continue to follow the literature and learn new techniques? Is it of sufficient generality to allow for later shifts in career?	Yes. We have avoided the teaching of specific technologies in favor of general concepts. For example, our database program is applicable to both Oracle and MySQL.	

9. Does this preparation provide a significant secondary expertise to primary careers? If yes, explain the purpose of the training – is it designed primarily or in part to meet the needs of those already employed for upward mobility, entrepreneurship, or other career upgrade?	Several of our students are currently employed within the industry. Many are here for the expressed purpose in gaining new skills to enhance their professional growth and development. As mentioned earlier, we must continually deal with the 'long-tail' phenomenon, where a handful of students may wish to learn about a new and emerging technology. In order to better address this phenomenon, the department must work with the Division Dean to analyze enrollment patterns.	
10. Describe any pre-collegiate or noncredit pathways that exist to direct students into the program?	This is an area that the department had begun developing prior to the recent economic crisis. There is a great need for "bridge" courses that could provide basic skills students with a viable path into professional computing careers. The department has discussed potentially "partnering" with programs such as Math My Way to build strong career pathways.	

11. How does this program prepare students for competitive employment?	The department seeks to enhance students' knowledge in computer science, administration and management, production and processing, communications and media. Programs are designed to raise skills in systems analysis, critical thinking, active listening, judgment and decision making, monitoring, speaking, systems evaluation, time management, active learning, complex problem solving, programming, and troubleshooting. Specific industry areas include (but not limited to) (EMSI Descriptions): **"Computer Programmers (O*NET Code 15-1021.00)** Convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. May program Web sites. **Computer Software Engineers, Applications (O*NET Code 15-1031.00)** Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. **Computer Software Engineers, Systems Software (O*NET Code 15-1032.00)** Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering, and mathematical analysis.

	Computer Systems Analysts (O*NET Code 15-1051.00) Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. May supervise computer programmers. **Database Administrators (O*NET Code 15-1061.00)** Coordinate changes to computer databases, test and implement the database applying knowledge of database management systems. May plan, coordinate, and implement security measures to safeguard computer databases." (Source: EMSI Complete Employment, Spring 2009).	

Advisory Board	
12. List your advisory board members. The list of advisory board members should include their job titles as well as their affiliations, and an accompanying explanation should make clear that the professionals on this committee represent those within the industry who would hire graduates of a proposed CTE program.	Board Members include: Peter Kellner, John Feigle (IT Director at InfoLink), Albert Chen, (Cogswell College), William Luciw, (independent consultant Viewpoint West Partners), Wesley Chun, (Python software engineer at Google), Peter Kellner (independent consultant), and Kathy Alberts (E-meter). **Peter Kellner -** founded 73rd Street Associates in 1990, where he successfully delivered systems for university clinic scheduling, insurance company management, and a turnkey physician office management to more than 500 customers nationwide. Peter is also the founder of the Silicon Valley Code Camp, a free annual conference that draws developers from around the world to discuss, share, and explore new technologies and developmental approaches. Among the technologies he currently is involved with are ASP.NET, Silverlight, Oracle, Java, VOiP, and,SQL Server.
13. List the dates and number of members attending of your most recent advisory board meetings.	The CTIS Advisory Board meets quarterly. The last meeting was held during the Fall 2010 quarter, December 10, 2010. **Members Present:** Elaine Haight (CTIS Instructor), Jerry Cellilo (CTIS Counselor & Instructor), Mike Murphy (CTIS Instructor), Zarmina Razzaqui (CTIS Division Admin Assistant), Judy Baker (CTIS Division Dean), Peter Kellner, John Feigle (IT Director at InfoLink), Albert Chen, (Cogswell College), William Luciw, (independent consultant Viewpoint West Partners), Wesley Chun, (Python software engineer at Google), Peter Kellner (independent consultant), Kathy Alberts (E-meter)

	The Advisory Board provides feedback and industry perspectives related to CTIS program development and direction. As a result of our last meeting, it was recommended that: In addition to the technical skills, employers are looking for people with… → People skills → Teamwork skills → Reading, writing and presentation skills → Judgment skills → Strong understanding of ethics and personal responsibility → Focus on value or "wealth" creation.
14. What have been the major outcomes of your advisory board meetings? Of those outcomes, which have been acted upon, and what is your plan of action with regard to other outcomes discussed?	Students should be prepared to face global competition. There seems to be an EDD (Education Deficiency Disorder) in the United States. USA is great for innovation but many good jobs are going outside. The group has also discussed exploring new program in emerging areas such as: **[1] Data Center Virtualization** Grid computing as a utility is driving a new set of data center economics that is fundamental to the shift we are seeing in many other areas, some detailed below. For example, companies like 3Tera offer tools which allow complex Web applications to be built, deployed and managed using visual tools on massive utility computing grids. This will fundamentally change how future data centers will used as well as the underlying cost structure of deploying and managing Web applications.

	[2] Cloud Computing Platforms Amazon has Amazon Web Services, Facebook has their F8 platform, Google has recently released their App Engine, IBM has announced their "Blue Cloud" and Microsoft is also rumored to be readying their cloud service. Web applications are increasingly using so-called cloud computing services in order deploy and scale applications. Building on data center virtualization technologies (like VMware & Citrix), we are now witnessing the emergence of utility computing as a commodity. **[3] Agile Web Development** The incredible success of rapid development environments like Ruby on Rails, Python Django and even the Zend PHP Framework indicates the importance of not just the underlying dynamic language, but the supporting application framework as well. These next generation Web development frameworks consolidate best practices and enable community support in unprecedented ways, and offer great opportunities. **[4] Social Computing** While the recent interest in companies like MySpace, LinkedIn and Facebook is intriguing, more important are the implications to both consumer and enterprise business models. The 'social graph' is quickly becoming an important concept and computing data structure, as well as issues of privacy and liability. As Google pushes forward with Open Social and Facebook makes their F8 platform Open Source (sort of), social computing expertise is becoming vital.	

	[5] Project/Program Management Given the accelerated pace of Web application development and the increasing complexity of managing geographically distributed teams, this is a vital area of expertise. Beyond PMP certification, there are pragmatic techniques that can be used to successfully manage a single project, and these can also scale up to program management. Next generation project management is absolutely vital to successful Web deployment. **[6] Open Source** Understanding how Open Source projects can directly affect your project and business model is absolutely critical these days, for both large and small companies. Understanding the project lifecycle and open source ecosystem is an important area for anyone developing Web applications.
Program Accreditation	
15. Is this program subject to approval by specialized state, regional, or national accrediting agencies?	No
16. What is the program's accreditation status?	N/A
17. Indicate recommendations of the most recent accreditation evaluation of the program and corrective actions taken or planned. Most recent accreditation report and all additional pertinent documentation and explanations should be available on site for consultant review.	N/A
18. Provide a brief analysis of student performance on licensure or board exams on first attempt.	N/A
19. What indicators does your program use to determine success of our students after completion?	N/A
20. Does your program survey employers for satisfaction of our students who have earned a degree/certificate? Provide brief analysis of employer satisfaction.	N/A
21. Does the department's analysis of labor market demand, advisory board recommendations, and accreditation status (if applicable) reflect the data?	N/A

22. Have any/all issues been identified in the program plan and are they adequately addressed with appropriate action plans? Explain.	N/A
Summary of Planning Goals and Action Plans	
23. What are your 4-year goals based on areas identified in the Career and Technical Education section of the program plan and how will those goals be measured?	Institutions of higher education have a social obligation to offer individuals an opportunity to improve their lives through better education. It is essential that despite current economic conditions, we find creative and innovative means to increase **access and awareness** so that underserved populations have the ability to begin a path of self-improvement. In addition to raising access and awareness, we must endeavor to remove all possible barriers that stand in the way of student success and persistence. Multiple studies have shown that an institution's constant pursuit of **excellence in teaching and learning** has a tremendous positive effect upon student success and persistence. The development of clear strategic objectives that guide institutional objectives can lead to better program development and student learning outcomes. In addition to clear learning outcomes, there is significant research that observes students' early and frequent interaction with institutional faculty and staff can lead to higher retention levels. High levels of interaction lead to greater feeling of academic competence along with an improved sense of self-efficacy. All operations should be grounded in this philosophy. The development of **workforce readiness and communication** is fundamental need in order to improve our community. When students enter or re-enter the workforce, their newly acquired skills make them more productive, while enhancing their individual earning potential and fueling local economic growth.

		In order to improve and promote **program effectiveness, planning and assessment –** it is necessary to seek ways to identify, collect, and evaluate meaningful data that could lead to improved instruction and higher academic quality. We will work closely with the Office of Curriculum and Instruction to identify existing (and new) data sources that might be utilized for better program development and decision making. From a project management perspective, we shall endeavor to (1) improve institutional methods of identification, servicing, and progress tracking for career technical education students; (2) improve career and academic counseling resources for CTE students focusing on student program selection and student retention; (3) research and implement an ePortfolio system for CTE student career planning and workforce preparation; (4) create a scalable, multidisciplinary Workforce Literacy Skills Program; (5) create a new model for inter-organizational CTE resource and service coordination; and (6) create a new pathways model for internship and job placement opportunities leading to higher wage and high demand areas.	
24. Are additional resources needed to accomplish career and technical education goals? If yes, identify the resource, as well as the purpose and rationale for each resource.			
Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**	

IX. Resource Planning: Personnel, Technology, Facilities, and Budget	
Faculty	
1. How does your PT/FT ratio impact the program?	The PT/FT ratio is almost 1:1 (9/8). Given consistent growth in enrollment, WSCH, productivity, and job demand, the department needs to grow our FTEF by one position.
2. What staffing needs do you anticipate over the next four years. (Consider: retirements, PDL, reassigned time, turnover, growth or reduction of the program)	With the steady growth in the market, it has become increasingly difficult to find qualified part-time faculty. From 2007/08 to 2008/09 PT/Overload declined 27%. Full-time FTEF had increased 11% for the same period. Given the steady growing demand for CIS instruction, it necessary to seek an additional CIS FTE. The growing job demand in the Silicon valley requires that we find a well-rounded and fresh talent that understands the newest innovations in software engineering, computer science, and information technology. With the proliferation of high-enrollment online courses, staff support in the form of paid tutors with BS degrees in CS are going to be needed. Faculty training in student feedback technology (clickers) must be incorporated in the professional development activities of classroom faculty.
Classified Staff	
3. What staffing needs do you anticipate over the next four years. (Consider: retirements, PDL, reassigned time, turnover, growth or reduction of the program)	CTIS has ten laboratories and 8 classrooms with over 330 computers to maintain and update. In addition, we maintain and administer over 37 specialized instructional servers. This is accomplished by two instructional computer laboratory administrators, two instructional associates (one full-time, one part-time), and one laboratory technician. In 2001-2002, there was a supervisor position which was vacated due to retirement. Currently, staff are directly managed by the CTIS Dean.
Technology and Equipment	

4. Are the existing equipment and supplies adequate for meeting the needs of the instructional program?	**No.** 42 computers were replaced in our Microsoft lab (4306) in February 2007. Most of our other computers are towards the end of their durable lifecycle and are becoming quite obsolete. The machines are very much in need of replacement. We will need to refresh labs 4202, 4203, 4223, 4305, 4306, 4308, and 4309, and the KCI open lab. Currently we have Measure C funding allocated for these labs. Refreshing these labs is a high priority, not only for CTIS, but also in supporting numerous other divisions that have been increasing their use of these resources. Although begun several years ago, multimedia upgrades for rooms in buildings 4200 and 4300 have not been completed. We are currently creating a technology planning document that will identify specific system needs, requirements, and priorities. The recent installation of WiFi in 4200 and 4300 will be a great help. We are currently investigating the costs associated with procuring two mobile lab carts (40 laptops each), which would greatly enhance our ability to provide computer-supported education in multiple spaces. Software updates are also needed to take place on a regular basis. CTIS has improved costs in these areas by implementing several years ago a license distribution method which allows us to put software on all machines, but only pay for a much smaller number of copies, which are then available on a first-come-first served basis to end users. We have also been able to continue taking advantage of less expensive upgrades through educational discount programs. We spend upwards of $20,000 per year to keep pace with the constant need for licenses and upgrades.	
5. Do you have adequate resources to support ADA needs in your physical and/or online courses and classrooms?	**No.** The division as a whole has been and will continue to be looking to better identify barriers opposing student success.	
6. Is the technology used in your distance education courses appropriate to the nature and objectives of your courses? Please explain how it is appropriate or what changes are underway to make it appropriate. Explain.	Yes.	

Technology & Equipment Definitions	
• **Non-instructional Equipment and Supplies:** includes equipment for "office use" that is non-instructional and that is not used in a lab or classroom – it includes non-programmatic equipment for individual instructors and staff, such as a desktop computer for office use. Desktop technology (computers, printers, scanners, faxes) and software requests are processed through your Dean or Director.	
• **Instructional Equipment and Supplies:** includes technology, software, and supplies used in courses or labs, including occupational program equipment. Instructional program equipment requests are prioritized by the department and then by the Dean or Director.	
• **Durable Equipment and Furniture:** includes non-instructional, non-technology equipment (chairs, tables, filing cabinets, vehicles, etc.) necessary to improve the operational functioning of the program/department.	
• **Note:** It is recommended that divisions perform and maintain an inventory of all their technology and equipment.	
Facilities	
7. Are your facilities accessible to students with disabilities?	**Yes**
8. List needs for upgrades for existing spaces	**N/A**
9. List any new spaces that are needed	**N/A**
10. Identify any long-term maintenance needs.	Standard building maintenance and repair including student desks/chairs, carpets, paint, and doorway equipment is continually needed. There is a particular problem with the doors in that through age and use, people must "slam" the door in order to secure the lock.
11. Are available general use facilities, such as classrooms, laboratories, and faculty office/work space adequate to support the program? Please explain.	No. Instructional: Networking hardware and software to support language and networking classes. Routers, WiFi, security software, online software, servers to augment online courses that our CMS (ETUDES-NG) does not support. We may need to purchase licenses for some online learning software as we expand or move from ETUDES-NG to systems like Blackboard or Moodle. Clickers - we must start implementing clickers in classrooms as this technology will become standard in the next decade.
12. Are work orders, repairs, and support from district maintenance adequate and timely? Please explain.	Yes
Budget	

13. Are the A-budget and B-budget allocations sufficient to meet student needs in your department?	No. Continually declining B budgets have raised many challenges in maintaining quality operations and services by the Division. We have also been able to leverage community donations of hardware to offset our expenditures. Staff have also been very frugal in finding low-cost solutions for our continual maintenance and repair needs.	
14. Describe areas where your budget may be inadequate to fulfill program goals and mission.	We do not currently have the budget to supplement student learning through tutorial services with exception for limited Perkins funding. We would like to be able to recruit and pay specialized student tutors who would be able to support struggling students. Our inability to provide this essential support has limited the ability to put access into action. As we receive students who are academically less-prepared, their attrition rates rise significantly. We are currently utilizing Perkins funding for the LITES student support program. However, those funds are limited and not intended to support the future needs of existing programs. Even in the Silicon Valley, there is a digital divide that disenfranchises a large underserved population from access to higher paying technical careers. It is essential for us to champion the cause of access for all. We are doing this though our emerging Career Technical Education (CTE) programs. Although we are developing these programs, there are no resources for providing this population needed support to succeed on the CTE path once started.	
15. Are there ways to use existing funds differently within your department to meet changing needs?	We are already utilizing cost-saving strategies to their maximum and will continue to do so.	
Summary of Planning Goals and Action Plans		
16. What are your goals with respect to resource planning and how will those goals be measured?	As a result of this program review, CTIS departments will meet quarterly to discuss resource planning, prioritization, and use. Changes will be reflected in annual updates to the program review.	
17. Are additional resources needed to accomplish your resource planning goals? If yes, identify the resource, as well as the purpose and rationale for each resource.		

Identified Resource	Purpose	If requesting funding, provide a rationale for how each request **supports one or more college strategic initiative and/or supports student learning.**	

X. Final Summary of Goals, Commitments to Action, and Resource Requests

1. Upon review of this program plan, provide a comprehensive summary of goals met or in progress and resources awarded from the previous program plan.

Key Division Priorities:

- Access and awareness
- Excellence in teaching and learning
- Workforce readiness and communication
- Program effectiveness – planning and assessment

Key CIS Departmental Objectives: The CIS Department strives to create a student-centered learning environment that supports:

- Preparing transfer students for successful matriculation to computer science,
- Training professional workers and technicians,
- Training students in current and emerging programming languages and techniques, database development and administration, operating systems, along with basic computer and information literacy.

In order to meet these objectives, the Department shall:

- Maintain and enhance instructor and curricular currency.
- Identify and address factors influencing student drops and late Ws.
- Identify ways to encourage and increase certificate/degree program completion.
- Retire outdated curricula and create new relevant courses.
- Identify problem areas for underrepresented populations.

- Examine and address student equity issues in the areas of retention, success, and non-success.
- Improve transfer success.
- Establish strong career and academic pathways.
- Improve our ability to meet current and future industry demands.
- Continue strategic scheduling that supports certificate/degree completion.
- Seek increased internship opportunities for our students.
- Strengthen our k-12 relationships through articulated academic and career pathways.
- Leverage our partnerships with four-year institutions in supporting enhanced articulated pathways.
- Increase our industry partnerships through, advisory committee, internships, and workforce program development.
- Expand the Career Pathway Program for high school students. As the budget improves, our goal is to reinstitute the program and offer at schools with higher underserved populations.
- Identify resources that would support the creation of a student peer tutoring service. In the areas of programming, database, UNIX/LINUX, computer literacy, and information communication technologies (ICT).
- Work closely with the College marketing department in planning and implementing better promotion for programs.
- Research and implement upcoming areas in which new clubs might enhance student involvement.
- Develop and implement “bridge” courses that could provide basic skills students with a viable path into professional computing careers.
- Improve institutional methods of identifying, servicing, and progress tracking for career technical education students.
- Improve career and academic counseling resources for CTE students focusing on student program selection and student retention.
- Research and implement an ePortfolio system for CTE student career planning and workforce preparation.
- Create a scalable, multidisciplinary Workforce Literacy Skills Program.
- Create a new model for inter-organizational CTE resource and service coordination.

Goal /Purpose - Met or In Progress	Resource(s) Awarded	Related Learning Outcomes	Related Strategic Initiative or Core Mission
Develop strategic scheduling that supports certificate/degree completion.	None.	Look at a problem and zero-in on the best architecture for the job based on the intended use of the program. Demonstrate a	Workforce

		comprehensive understanding of language tools by synthesizing and integrating multiple language constructs in a single project.	

2. Upon review of this program plan, provide a summary of current or continuing goals and resources needed.

Note: If you are requesting resources this year, these items have to be included in your current program review. If you want the college to understand your full range of need, list every current and upcoming resource need in this section.

Goal/Purpose – Current or Continuing	**Resource(s) Requested** (Costs need to be included)	**Related Learning Outcomes**	**Related Strategic Initiative or Core Mission**
Create a new pathways model for internship and job placement opportunities leading to higher wage and high demand areas.	None.	Based on a given set of guidelines for a product or application, produce program specifications, create and debug code for those specifications and write comprehensible documentation.	Workforce

Supervising Administrator Signature Judy Baker, Dean	*Completion Date 12/17/10*