PROGRAM REVIEW 2008-2011

Division: Business and Computer Information Systems

Department or Program: Computer Information Systems

Name and Title of Preparer(s): Cynthia Lee-Klawender, CIS Dept. Chair + most of the other CIS Full-time faculty

In providing responses in the following areas, **please utilize the quantitative data available in the Program Review Enrollment Data Document and the Budget Document.** For the purposes of the Program Review, both departments and programs will be referred to as "program."

I.   **Description and Mission of the Program**

Which area(s) does this program considerably address (check all that apply):

___ Basic Skills   _X__ Transfer   _X__ Career/Technical   ___Other (describe)

A.   *Provide a brief description of the program including any services provided and the program's mission.*

> The Computer Information Systems Department offers courses to prepare students for transfer, to earn certificates and degrees, for job enhancement, and to provide learning opportunities for the "life-long learner".

> Courses fulfill lower division requirements for students transferring to colleges in the University of California system, the California State University system, and other universities. These courses prepare students whose intended majors are not only computer science but also for students majoring in business, engineering and management information systems.

> The certificates and degrees offered parallel the needs of the business environment in Silicon Valley. They include certificates and degrees in Computer Systems Security, Database Design, Network Administration, Programming, Project Management, and Tech Support/System Support.

> In addition to these core activities, faculty and staff advise students in the sequence of courses needed to reach their academic goals. The department faculty and staff inform students of ancillary programs and opportunities including available scholarships and internships.

B.   *Provide a summary of the program's main strengths.*

> The courses offered in the core computer science curriculum provide a solid foundation in the areas needed by the students transferring to a university. The concepts and skills learned prepare the student to meet the vocation-related challenges of today and tomorrow.

> We are leaders in the Silicon Valley in providing computer career courses for people working in industry. To enhance the learner's job prospects and increase the breadth of the student's learning experience multiple programming languages are offered including C, C#, C++, Visual Basic, Assembly, and Java. The degrees and certificates available for Programming parallel this breadth.

The requirements of the degrees and certificates are constantly updated to reflect the needs of industry. At the same time, effort is made to encourage transfer students to earn a degree or certificate while attending De Anza College. Several certificates and degrees require a minimum number of courses in addition to those needed for transfer.

The CIS faculty focuses on the Seven Principles for Good Practice in Undergraduate Education as presented by Chickering and Gamson in 1987. The lab hours attached to many of our courses promote faculty-student contact time. Most of the programming classes are held in classrooms equipped with a computer for each student. This increases time on task. Encouragement of communication between students is evidenced by the groups of students who avail themselves of the computer lab in the Advanced Technology Center to offer spontaneous peer tutoring and complete team assignments.

We magnify our positive impact in Santa Clara and beyond by reaching out to various segments of the population. These include providing courses to students concurrently enrolled at San Jose State University and at Santa Clara University. In conjunction with the Middle College program high school students are among are most creative and active learners in programming courses. They are grateful for the opportunity to expand their knowledge beyond what is available to them at their respective high school.

We have become "self-sustaining" as a department in the core curriculum. There is a full-time instructor prepared and able to teach each of the core curriculum courses. Part-time instructors bring new technologies into our course offerings. This maintains our position of one of the leading colleges in current technologies.

C.   *Provide a summary of the program's main areas for improvement.*
The department's retention rate increased from 80% in 2005-06 to 84% in 2007-08 lagging 4% behind the college's total. However, in success rate the department lags more than 10% behind the college total. Certainly many factors could possibly account for this difference. However, what is certain is that students are continuing past the withdrawal period but only 66% (2007-08) are receiving a passing grade. Students need to have a better support system in place when they have difficulty understanding the material or completing assignments. The success rate can be improved by making tutoring more available, by employing multiple methods of delivering this tutoring, and identifying students needing extra help earlier in the term. In addition to increasing the availability of tutoring, during the 2009-2010 academic year, online access to instructor during lab hours will be implemented as a pilot test program.

The department needs to expand its online course offerings. Several courses have just begun to offer the students the choice of attending class on campus or online. This model works particularly well for the more advanced courses. The advantage for the student is that he/she can expand his/her area of knowledge with a flexible use of their time. The advantage for the department is that these more focused courses can achieve minimum enrollment more frequently.

D.   *What are your expected outcomes (such as learning outcomes, transfer, career goals, certificate and degrees) for students in your program?*

Expected outcomes of a majority of our students include completing the courses required to transfer to universities in Computer Science, Engineering, and Information Systems. When the students complete required transfer courses, they are able to apply advanced problem solving in designing complex computer programs in one or more of the current computer programming languages.

For many of our students, success is achieved when the courses required for a certificate or degree in CIS are completed (includes a variety of certificates/degrees in many areas).

Many of our students are successful when the completion of a CIS course or courses enables them to become better contributors at their current jobs, or to be hired in a new job.

II.   **Retention and Growth**

A. How has the program responded to the institutional goal of increased access, growth and retention? (Include the number of students enrolled in the program and the retention rate over the last three years.)

Since 2007, the CIS Department has been growing and recovering from the "dot-com bust" of the early 2000s to the 2006-2007 academic year (our lowest year). Although from 2005-2006 to 2006-2007 enrollment dropped from 3813 to 3452, in 2007-2008 enrollment grew past 2005 to 3940.   Our retention rate grew from 80% to 84%.   Our efforts to increase access, growth & retention include

1. offering more sections of courses that students need for transfer
2. offering new courses in Computer Science topics that the community needs (like Project Management)
3. offering more online and/or hybrid (part online, part on-ground) courses
4. incorporating the use of online resources for a larger number of courses
5. providing tutoring in our core courses, including having a tutor come to the classroom during lab hours
6. encouraging students to apply for the Free Recycled Computer scholarship
7. providing free software to the students (for example, the CIS department purchasing the Microsoft Academic Alliance)

B. How has the program responded to the institutional goal of increased access, growth and retention <u>specifically for the identified targeted populations of African Ancestry, Latino/a, and Filipino/a students</u>? (Include the number and percentage of the program's enrollment that was made up of the targeted populations and the retention rate of the targeted populations over the last three years.)

There was little growth in CIS in targeted populations (10%, 8% and 10% for 2005-2006, 2006-2007, and 2007-2008, respectively) due to lack of Math knowledge or poor problem-solving skills of the targeted populations (required in order to take our computer programming courses). However, there was an increase in the retention rate of the targeted populations in those 3 years (71%, 72%, 75% for 2005-2006, 2006-2007, and 2007-2008, respectively).

To increase the retention rate, we have provided resources for all students (not only for targeted populations) to increase retention, but especially help disadvantaged students:
1. scholarships (Gilberg scholarship)
2. free textbook use in the CIS lab
3. encouraging students to apply for the Free Recycled Computer scholarship
4. providing free software to the students (for example, the CIS department purchasing the Microsoft Academic Alliance)

5. providing almost free (only $3 for each course) use of the CIS computer lab which is open 5 days per week 8:00 AM to 10:00 PM with instructors, lab aides and tutors available to provide assistance. (All students registered in CIS classes with lab hours have access to the open lab. Student accounts allow students to access the school's network, Windows XP machines, Macintosh computers, the Internet, etc.)

Future plans: start a mentor program (of either current or former students of the targeted populations)

C. The Statewide Basic Skills Initiative defines "basic skills" as English, mathematics, reading, writing and ESL skills. In what ways does your program address the basic skills needs of students? For programs that do not directly address basic skills, how does the lack of basic skills impact student success rates for your program?

Almost all of the CIS classes require Intermediate Algebra or Elementary Algebra in order to succeed in the courses. If a student does not have the problem solving and math skills expected after completing Elementary or Intermediate Algebra, the student rarely succeeds in completing any CIS certificate/degree/transfer program. All CIS courses expect a basic level of English reading & writing. If a student does not have a basic level of English reading & writing, his/her grades in the courses and/or program suffers, and the student earns lower grades in CIS.

III.   **Student Equity**

A. What progress or achievement has the program made towards decreasing the student equity gap? (Include student success rates for targeted populations compared with other students over the last three years.)

The success rate for targeted populations compared with other students has stayed about the same between 2005-2006 (58% vs. 70%) and 2007-2008 (53% vs. 67%, only differed about 2%).   One probable explanation of this may be that the students in the targeted populations have lower Math skills (evident in the lower success rates in the Math department's statistics).

B. In what ways will the program continue working toward achieving these goals?

The CIS department will continue to attempt to raise the success rates of ALL students, not only by providing the extra resources mentioned in II. A. & B. above, but to incorporate MORE in the classes:
1. Encourage tutoring in our core courses, including having a tutor come to the classroom during lab hours
2. Working in groups
3. Study groups
4. Having printed lecture notes that summarize the material
5. Providing different methods of teaching that cover different learning styles, including:
    *   hearing the material explained
    *   reading the material
    *   trying to implement the material in small exercises
    *   discussion of material

C. What challenges exist in the program in reaching such goals?
The greatest challenge is the lack of or lowers Math & problem solving skills in the targeted populations. This prevents them from either taking our classes, or from succeeding if the skills are not at the expected level. All of our core CIS courses require proficiency in Math/problem solving skills BEFORE starting the courses. We could try to have LINC courses, but the student really needs to have passed the required Math courses first.

IV. **Budget Limitations** (Please be specific in your responses.)

A. Identify any limitations placed on the program based on limited funding. What increases in resources are critical to the program and what are the consequences of continued limited funding on the program?
   a. Limitations
      i. Inability to procure new software and technologies given the annual cost of subscription of software and technology platforms
      ii. Lack of career resources to help direct students about the skills they should acquire and no links to employers for placing our graduates to positions in the industry

   b. Increase in Resources
      i. Budgets to procure new software and technologies to teach.
      ii. Lower the class size from 40 to 30 in order to give more individual attention to each student, increasing student retention and success
      iii. In addition to the tutors provided by Tutorial Services, budget to hire student aides, in the classroom
      iv. Budgets to recruit industry professionals to provide seminars to our students.

B. Describe the consequence to students and the college in general if the program were eliminated or significantly reduced. Please be specific.
   a. A large percentage of CIS student have intentions to transfer to 4-year college or universities, which includes many of the targeted groups. A large majority of the transfer students will have very few alternatives due to:
      • Lack of funds to attend a university
      • Budget cuts at the university and other colleges (including community colleges)
      • Inability to be admitted to universities (for example, low SAT scores, low grades)
   b. De Anza's CIS program is respected in the bay area given our ability to serve vocational learners. If the CIS program were to be cut, it would lead to a significant drop in the college enrollment. In addition, the quality and content of our courses meet or exceed many of the university extension courses, but at a fraction of the cost. This reputation attracts new students. If some of our emerging course offerings are limited this would reduce our enrollments.
   c. Lack of the CIS program offerings would reduce our ability to provide job training for positions such as database administrators, network administrators, web specialists and system analyst. These skills retraining courses are much needed for our students to find jobs in the industry. As a community college we are a natural supplier of low to intermediate skilled workers.

     d.   The CIS program offers courses to the "Middle College" students which they can use to transfer to a 4-year college. If our courses were eliminated, this option would not be available to them.

V.   **Additional Comments (optional):** What additional information is important to consider when reviewing the budget of your program for possible reductions? You may include any or all of the following, or other information.

1   **Strategic Planning Initiatives (Community Collaborations, Cultural Competency, Outreach, and Individualized Attention for Retention):** Describe any other Strategic Planning Initiatives your program has addressed.

Community Collaborations

The CIS Department recognizes the importance of forming liaisons with the high tech industry. By reaching out and being responsive to the industry, both our program and our students benefit and we, in turn, help train the future work force for the high tech industry.

Over the years the CIS Program has formed Advisory Committees of industry professionals who meet with the CIS department members. The Advisory Committee evaluates the CIS program and its degrees and certificates for relevance and completeness. The committee also suggests modification or addition to the program based on industry need and expectation. Finally, the committee advises the department on industry trends and on the required and expected skills of future work force.

One product of community collaboration is seen in our lab / class rooms. The CIS Program recently has procured a lab room equipped with Cisco equipment, donated by the company. To match this valuable donation, De Anza and the CIS Department have secured new computers and network to support the Cisco equipment. We are in dialog with Cisco to create classes that will train our students on Cisco technology. In addition, the CIS Department is also investigating a software and equipment grant with Sun Microsystems, which may result in our receiving Sun workstations and servers. This opportunity has the potential to enhance our Web Application and Java Software Development programs, and introduce our students to the Open Source community.

Another product of community collaboration is shown in our new programs that have been developed. An outstanding example is our growing Project Management program, which is a direct result of interactions and dialogs with the high tech industry. With software projects becoming increasing complex and distributed over different continents, Project Management is a key skill for the software industry now and in the future. Our classes in Project Management include regular guest lecturers from industry and students participate in projects that are evaluated by industry professionals.

Outreach

There are several ways that the CIS Program reaches out and supports students. Some of these are parts of a college wide program, and others are specific for the CIS Department.

Each year, during the College Open House, we staff a table to introduce incoming students and their parents to our program. We also have used the services of the De Anza Research Department at De Anza to conduct student surveys to obtain feedback from our students. We

have also worked with the De Anza Marketing Department to broadcast our course offerings to a broader audience.

In addition to participating in college wide outreach programs, the CIS Department yearly sponsors several Guest Lecture Series that are opened for all interested students. Industry professionals are invited as speakers at these events and share their perspectives, experiences, and advices with our students. We have also supported several student clubs, such as the Computer Science Club or the Linux Club, to encourage our students to build their professional network and to act as our ambassadors to their peer.

- **Relationships with Other Programs:** Describe any partnerships or collaborations that the program is actively engaged in, which reduce costs and/or improve service delivery.

The CIS Program actively works with other programs within our Division and college wide to reduce cost or to improve service delivery.

To reduce cost, the CIS Program shares classrooms with other programs, such as Accounting and CAOS, so that the classrooms are fully utilized throughout the day. In addition, these classrooms have instructor and student computers that are shared among different departments, thus optimizing the number of classroom equipment needed.

To improve service delivery, the CIS Program coordinates with a variety of programs to help student success and retention. A program that has had a long standing working relationship with CIS is the Tutorial and Academic Skills Center. CIS instructors regularly identify students in higher level CIS classes who have strong academic and communication skills, and encourage these students to become CIS tutors. Likewise, early in each quarter, CIS instructors identify students who need additional help and encourage them to take advantage of the Tutorial Center. CIS instructors also meet with the Tutorial Center staff several times a year in order to build an effective program that benefit both CIS tutors and tutees.

The CIS Program also collaborates with the De Anza Career Center, Coop and Education Work Study Program, and the FHDA Internship Program. We encourage, support, and often advise students as they explore various work or internship options that can enhance their study. Yearly, CIS instructors invite representatives from internship programs, such as NASA Ames, to come to class and speak to students about the program. As a result, many CIS students successfully find internships that are related to the Information Technology field.