# Palomar College – Institutional Review and Planning
# Instructional Programs

**Purpose of Institutional Review and Planning:**
The institution assesses progress toward achieving stated goals and makes decisions regarding the improvement of institutional effectiveness in an on-going and systematic cycle of evaluation, integrated planning, resource allocation, implementation, and re-evaluation. Evaluation is based on analyses of both quantitative and qualitative data (ACCJC/WASC, Standard I, B.3.)

## Department:  Computer Science & Information Systems

**Instructional Discipline Reviewed** _____  **2007-08**

**1.       3-year trend of quantitative data**

| | Fall 2004 | Fall 2005 | Fall 2006 | Fall 2007 | Fall 2001 | Definitions |
|---|---|---|---|---|---|---|
| **Enrollment at Census** | 2,739 | 3,179 | 2,929 | *2.993* | *4432* | *Self Explanatory* |
| **Census Enrollment Load %** | 74.73% | 73.66% | 67.64% | 74.01% | | Enrollment at Census Divided By Sum of Caps (aka "Seats") |
| **WSCH** | 6,297 | 7,431 | 7,047 | 7,079 | | Weekly Student Contact Hours |
| **FTES** | 209.91 | 247.71 | 234.92 | 235.98 | 315 | One Full-Time Equivalent Student = 30 WSCH |
| **Total FTEF** | 20.67 | 22.20 | 22.20 | 20.70 | | Total Full-Time Equivalent Faculty |
| **WSCH/FTEF** | 305 | 335 | 317 | 342 | | WSCH Generated per Full-Time Equivalent Faculty Member |
| **Full-time FTEF** | 6.40 | 8.40 | 7.40 | 7.40 | | FTEF from Contract Faculty |
| **Hourly FTEF** | 12.80 | 10.67 | 11.47 | 9.53 | | FTEF from Hourly Faculty |
| **Overload FTEF** | 1.47 | 3.13 | 3.33 | 3.77 | | FTEF from Contract Faculty Overload |
| **Part-Time FTEF** | 14.27 | 13.80 | 14.80 | 13.30 | | Hourly FTEF + Overload FTEF |
| **Part-Time FTEF %** | 69.03% | 62.16% | 66.67% | 64.25% | | Percent of Total FTEF Taught By Part-Time Faculty |
| **Retention Rate** | 86.54% | 87.92% | 87.01% | 89.04% | | Non-W Grades (A,B,C,CR,D,F,FW,NC) Divided By A,B,C,CR,D,F,FW,NC,W Grades |
| **Success Rate** | 62.28% | 59.43% | 59.83% | 62.33% | | A,B,C,CR Grades Divided By A,B,C,CR,D,F,FW,NC,W Grades |
| **Degrees Awarded** | 8 | 11 | 7 | NA | | Total number of Degrees awarded for the Full Academic Year |
| **Certificates Awarded:** | 20 | 29 | 24 | NA | | Total number of Certificates awarded for the Full Academic Year |
| **   - Under 18 Units** | 14 | 18 | 15 | NA | | Total number of Certificates awarded for the Full Academic Year |
| **   - 18 or More Units** | 6 | 11 | 9 | NA | | Total number of Certificates awarded for the Full Academic Year |

**2.   Reflect upon and analyze the above 3-year trend data.  Briefly discuss overall observations and any areas of concern or noteworthy trends.**

**Statistics from Fall 2004 to Fall 2007:**
▪ Increase in Enrollment at Census by 9.3%
▪ Census Enrollment Load Report remains constant at about 74% implying that the number of sections offered per semester is about right.
▪ Increase in WSCH by 12.4%
▪ Increase in FTES by 12.9%
▪ Increase in WSCH to FTEF by 12.1%
▪ Increase in Full-time FTEF by 15.6%. About 40% of FTEFs are being generated by full-time faculty while about 60% of FTEs are being generated by part-time

faculty. This indicates the need to hire additional CSIS full-time faculty.

Dick Borden, from the Institutional Research & Planning office, was kind enough to provide CSIS data for Fall 2001 which I noted in the 3-year trend of quantitative data chart. This data shows an astounding Enrollment at Census of almost 50% greater than we see in Fall 2007. Analysis of this enrollment bubble is twofold: First, at that time, CSIS was the first college in Southern California to offer the new Microsoft Certified Systems Engineer (MCSE) program which allowed students to pay approximately $50/course as opposed to $1200/course then offered by the private computer training centers. This was an extremely popular program but enrollment has now tapered off. Second, this time period corresponds with the dot-com bubble burst. CSIS has always experience periods of growth in times of economic uncertainly as those who lost their jobs return to school for retraining. Apparently we are again entering such an economic downturn and we would expect CSIS enrollment to expand, if allowed, during the years ahead.

3. **Reflecting on the 3-year trend data, describe/discuss discipline planning related to the following:**

| PLAN – 2007-08 | Progress – 2008-09 |
|---|---|
| a. **Curriculum, programs, certificates and degrees (consider changes due to CSU/UC transfer language updates, articulation, workforce and labor market projections, certificate or degree completions, etc.)**<br><br>The 3-year trend data continues to present a mixed picture of the Computer Science and Information Systems department here at Palomar College. The 2004 data can be described as the bottom of the curve of restricted enrollments that occurred as a result of the dramatic failure of many Internet companies that were created in the late ninety's. Compounding that downturn was the effect the 911 attacks had on the economy of this country. Data from 2005 generally shows recovery in most statistical categories and 2006 data, although down slightly from 2005, continues to show growth from 2004.<br><br>The information systems economy is now showing real recovery with many companies hiring graduates at an increased rate. Government forecasts continue to place information technologies as one of the top two or three careers in the next ten years.<br><br>Through contacts in the local technology economy as well as formal advisory committee meetings, the CSIS department at Palomar has been carefully evaluating the need for graduates from our programs and has adjusted the curriculum, programs, certificates and degrees to respond to changes in the workforce. More emphasis has been placed on giving students exposure to the Internet, network, and database technologies. The department made a concerted and successful effort to re-establish a close transfer relationship with San Diego State University as well as to maintain contacts with other Baccalaureate level colleges in the area. | During the Fall of 2007 and Spring of 2008 the department is undertaking a project to better differentiate and focus our curriculum. Instead of listing all curricula programs, certificates and degrees, within a single department designation of CSIS, the department has established five new disciplines within the department. These new disciplines are: Computer Science, Information Technology, Networking, Web Technology, and Database. Each faculty member will be heavily involved in establishing cohesive identities within these disciplines. These changes will enable current and prospective students to more easily identify those programs in which they are interested.<br><br>Increased interest and enrollments in information technology related programs by local students will bring additional demands on the entire department. New programs and classes will need to be developed to insure that Palomar continues to be able to provide graduates to the high-tech industries either already here or planning to come to North County. New courses are being developed in C#, C++0X programming languages, mobile programming (iPhone, gPhone), and Mac programming and Web 2.0. In future years the dramatic growth of information technologies within all areas of the world economy will bring substantial increases to the CSIS department enrollments at Palomar. Technologies such as wireless communication, the integration of entertainment and information systems, digital security, computer forensics, outsourcing and off-shoring will impact enrollments in the CSIS departments and we will need to expand both our programs and infrastructure to prepare for these students. In addition major efforts to globalize information systems will also require new investments in the department for hardware, software, facilities and faculty.<br><br>As continued innovation occurs with the information systems industry the department will need to embark on serious efforts to replace outdated |

|  | equipment, software and other infrastructure. The construction of a new building to house the department will be a continuing project requiring input from all members of the department. |
|---|---|
| **b. Class scheduling (consider enrollment trends, growth, course rotation, comprehensiveness, etc.)**<br><br>Given the increased demand for Internet, network, and database technologies, the CSIS department plans to increase the scheduling of classes in these areas. Additionally, CSIS has reworked the professional certificate and AA degree programs so that sequenced classes can be scheduled in a consistent manner, aiding students' planning. We plan on marketing this program aggressively.<br><br>CSIS plans to respond to the demand for online training by scheduling more classes and programs that may be completed entirely over the Internet. We plan to look for opportunities to offer entire certificate programs online and market those programs aggressively.<br><br>CSIS continues to look for optional scheduling options for the Oracle Database Administrator certificate and plans to provide the infrastructure via virtual remote partitioning of our Oracle server to allow students to practice server administration off-campus. This would allow the DBA classes to be offered in a hybrid format meaning that students would do a portion of their class online.<br><br>Computer Science classes are being planned for daytime and online scheduling as before, but may see an increased enrollment as the industry grows and government hiring expands.<br><br>The increased emphasis on homeland security and business security will allow us to develop and schedule more classes in this area. Wireless security is also a growing field where we will see increased scheduling.<br><br>Gaming will continue to be a fast growing area that pushes the envelope of both hardware and software. We will be looking for areas to expand our offering in both the Graphic Design and programming areas.<br><br>The Networking areas of Cisco, CompTia Netowrk+, CompTia A+, CompTia Security+, Wireless and Security. In addition, we will be looking to bring up a Networking degree track in Home Automation / Home Networking/ Distributed Audio and Video / Intercom and new course offerings in VOIP. We would like to resurrect our course in network cabling and infrastructure which includes | CSIS has expanded our combined-class offerings in the schedule set through Spring 2008 in the Web Technology area with the goal of both better serving students' needs and increasing enrollment.<br><br>A new class in AJAX (Asynchronous JavaScript and XML) is being taught in the Spring 2008 semester and planning each upcoming semester for the foreseeable future. This advanced class will bring back students that have previously enrolled in CSIS for more training.<br><br>CSIS has scheduled the Oracle Database Administrator certificate program on Friday evenings and Saturdays to help accommodate students who are working full-time.<br><br>Computer Science is being taught in both online and lecture formats with an eye towards being able to offer the degree completely online for those who prefer that option.<br><br>Networking classes have been added in the wireless and security areas. |

the installation of copper, fiber, line of site and broadband wireless media.

**4. Discuss/identify the resources necessary to successfully implement the planning described:**

| PLAN – 2007-08 | Progress – 2008-09 |
|---|---|
| **a. Equipment/Technology – block grant funds, VTEA, other resources, etc.** | CSIS requires laboratory environments for implementing curricula that represent state-of-the-art technology. While other departments utilize computers to supplement their curricula, computers are the essence of the CSIS curricula. The CSIS department is literally defined by the laboratory environment in which its programs are offered. To best serve our students and meet their preparation needs at the highest level of competence, we must provide learning environments that effectively mirror the current technology of the real world. In order to be able to develop and support a viable, relevant and innovative curricula that attracts and retains students, the CSIS department must have the necessary, on-going financial support to maintain state-of-the-art laboratories. Without this support, the department's ability to accomplish its goals is significantly diminished.<br><br>Unfortunately the condition of the computer labs in the CSIS department is rather poor. Our computers are old and many of our monitors are hard to read. Our students tell us that they have better equipment at home and ask why they should be taking classes at Palomar. Additionally, outdated technology in our computer labs prevent us from offering more current curricula. Case in point, Vista has been available for over a year and students are expecting to see the operating system in our labs. Unfortunately, our computers are unable to run Vista. Once again, the CSIS Department is literally defined by the laboratory environment in which its programs are offered. (Is anyone listening?)<br><br>While the demand for technology is ever increasing, the supply of IT talent continues to fall far short of demand. A recent survey reported that almost 20% of top U.S. IT executives identified the lack of skilled personnel as the most serious constraint to growth in their businesses. The need for well trained IT workers is enormous in San Diego County. Labor market information released by California's Employment Development Department (EDD) projects that for the years 2004 – 2014, five of the six fastest growing occupations for San Diego-Carlsbad-San Marcos Metropolitan Statistical Area are shown below:<br>• Network Systems and Data Communications Analysts |

• Computer Software Engineers, Applications
• Computer Software Engineers, Systems Software
• Network and Computer Systems Administrators
• Database Administrators

In recently released data by the College Board, the same occupations were identified as five of the eight fastest growing occupations for college graduates. The CSIS department offers training in each of these areas. CSIS enrollment is currently limited by the lack of lab space in which we can offer our programs. Fortunately, CSIS is poised to move into the new MIB where lab space will be increased. However, in order to be able to develop and support curricula that attracts and retains students, the CSIS Department must have the necessary, on-going financial support to maintain these laboratories. Without this support, the department's ability to accomplish its goals is significantly diminished. This is the most crucial issue that the CSIS department has had to deal with in the past and will remain crucial for the survival of its programs.

Based on enrollment projections, CSIS has been given 12 labs in the MIB. The labs have been initially identified as follows:

▪ 2 Network and A+ lecture labs
▪ 2 Network and A+ workrooms
▪ 1 Home Automation-Cabling workroom-Optic Fiber workroom
▪ 2 Mac Labs (Mac, Windows, Linux, Mobile Software development)
▪ 5 general-purpose computer labs (Computer Science,  Database, Information Technology, Web, Video Gaming, Applications)

Initial requirements for the each of the labs are as follows:

**Networking/Home Automation Labs**
▪ 30 computers to populate each lab
▪ Server for security classes
▪ 2 servers for the Networking and Home Automation / Audio-Video Programs.
▪ Servers and equipment for VOIP and Home Automation classes
▪ At least 4 switches for all network labs and workrooms
▪ At least 2 laptops for wireless testing
▪ Networking equipment (multi-meters, cable testers, etc)
▪ Dedicated drop walls, 2, at 8 foot by 16 foot for Home Automation / Audio-Video equipment and network wiring demonstration. Half of each wall will be filled with equipment and wiring infrastructure under plexiglass, the other half of the walls will be removable sheetrock so that student may

practice installation technique.

**Mac Labs**
▪ 30 computers to populate each lab which can run Apple, Windows and Linux operating systems and applications software.
▪ Servers for classes in Mac labs

**General-Purpose Computer Labs**
▪ 2 general-purpose servers
▪ Server for Web development classes
▪ Server for Oracle and SQL database classes
▪ Equipment for game design XNA coursework - software, licensing, support, 1-2 consoles and target system for at least 1 lab

**General Lab Requirements**
▪ 48-port switches for segregation of classrooms during certain labs and classes
▪ Overhead cameras, smart boards, mikes and speakers for class lectures (needed for every lab room where lecturing may occur, 8-12 instances)
▪Software / hardware for instructors to control student stations during lectures (needed for every lab room where lecturing may occur, 8 x 31 seats)
▪ Software for classroom machine maintenance (Ghost and Deep Freeze)
▪Security cameras and server/recorder for laboratory and classroom security (needs to be accessible by staff who will monitor lab usage during all open hours of operation)
▪ Removable mass storage devices for special classes or equivalent server based solution (used for classes that require individual student systems that will be modified by students as the class progresses)
▪ Server and switch racks for back end and classrooms (2 racks in server room; at least 4 racks for each network workroom and at least one of the network labs; enough space for expansion and movement of equipment as needs arise)
▪Scanners and printers (at least 3 scanners and a printer for every lab and workroom)
▪Pay-for-print software/hardware solution for efficient printer management

▪ Equipment and tools for Robotics High School outreach program
▪ Extra expendable PCs for A+ cert labs (must be no older than 4 years and will be taken apart and reassembles, repaired, and modified by students)
▪ All hardware systems must be under a warranty

| | |
|---|---|
| **b. Budget – budget development process, one-time funds, grants, etc.** | Funding for CSIS programs is currently down from previous years. This has prevented us from upgrading our computer labs and has had a negative impact our curriculum. As CSIS plans its move into the new MIB, the number of labs CSIS will be responsible for will increase from five to twelve. Accordingly we anticipate the need for additional funding for both support staff and equipment. We need a commitment from the college to support our programs by funding, on a regular basis, new computers and servers, printers and scanners, tools for software and web development, etc. Without this support, the department's ability to accomplish its goals is significantly diminished. |
| **c. Facilities – schedule maintenance needs, additional classrooms/labs due to growth, remodeling, etc.** | See 4a. |
| **d. Faculty position(s) – faculty priority process and projected full-time needs for 1 – 3 years** | Once again, labor market information released by California's Employment Development Department as well as the College Board predict that the fastest growing occupations are in areas in which CSIS offers training.<br><br>We project the need for 2 or 3 additional full-time faculty members within the next 2-3 years and our FTES contract/adjunct ratio justifies this hiring. Additionally, it is likely that two full-time faculty will be retiring within the next three years. It is critical to the integrity of the classes they teach that the retiring faculty be replaced with full-time faculty within an academic year of their retirements. It is crucial to the fulfillment of the department goals and implementation of its new programs that these positions be filled ASAP. |
| **e. Staff position(s) – changes in instructional or support needs due to program growth, new technology, etc.** | CSIS will be relocating to the Multidiscipline Instructional Building (MIB) in the Fall of 2010. At that time we will be responsible for 12 computing labs (currently we're responsible for five.) To provide appropriate support for these labs the department will require the following **additions** to our staffing:<br>- 1 systems analyst II<br>- 2 systems analyst I<br>- 1 part-time Instructional Support Assistant<br>- At least 5-8 student lab assistants |
| **f. Other** | |

**5. Discuss one discipline goal linked to Palomar's Strategic Plan 2009 and how it will support the success of students.**

The goal of the CSIS department is to possess state-of-the-art technology (both hardware and software) in CSIS labs at all times. This is directly linked to the Palomar Strategic Plan 2009 Teaching and Learning Excellence goal to "provide up-to-date technology and related technical and equipment support for instructional purposes". Achieving this goal will support student success by allowing students to gain skills in computing environments that match or exceed anything available in industry or other academic setting.

This is the most crucial issue that the CSIS department has had to deal with in the past and will remain crucial for the survival of its programs. CSIS must have laboratory environments for implementing the curriculum that represent state-of-the-art technology. While other departments utilize computers to supplement their curriculum, computers are the essence of the CSIS curriculum. **The CSIS Department is literally defined by the laboratory**

**environment in which its programs are offered.** To best serve our students and meet their preparation needs at the highest level of competence, we must provide a learning environment that effectively mirrors the current technology of the real world. In order to be able to develop and support a viable, relevant and innovative curriculum that attracts and retains students, the CSIS Department must have the necessary, on-going financial support to maintain state-of-the-art laboratories. Without this support, the department's ability to accomplish its goals is significantly diminished. The CSIS Department would welcome the opportunity to explore with the administration the formalization of such a plan.

6. **Student Learning Outcome progress:**
    a. **Describe a learning outcome at the course or program level and the assessment used to measure student learning of that outcome.**

**Student Learning Outcome:**
Students will be able to create an Excel Worksheet with an Embedded Chart using Microsoft Office Excel

Description: To demonstrate this Learning Outcome Students will acquire the knowledge and skills to:
- Open and Exit the Microsoft Office Excel software
- Enter numeric and non-numeric data into the cells of an Excel Worksheet
- Utilize the Excel software Ribbon to access the necessary tasks involved in creating and formatting an Excel Worksheet and Chart

**Assessment of Student Learning Outcome:**
Measurement of this Learning Outcome will be achieved by direct methods through:
- Performance – 90% of the students will be able to create an Excel Worksheet with no major errors in its construction
- Testing – On an objective type test designed to assess the Students' knowledge of the dominant features of the Excel software and of the concepts involved in creating Excel Worksheets the average score will be 70% or higher.

    b. **Discuss a learning outcome that is observable yet difficult to measure.**

**Student Learning Outcome:**
Students will take responsibility for their own learning and develop a capacity for appropriate independence and self-reliance in the learning environment

Discussion: There are students who evidence this learning outcome in various observable behaviors such as:
- complying with directions from the instructor
- responding to expectations
- submitting assignments on or before due dates
- exhibiting high levels of performance
- seeking support when needed

However, while this is a valid learning outcome, especially for students in an online class, it lacks subject material relatedness and is, therefore, not able to be assessed in terms of measureable knowledge or skill acquisition relative to course content. Also, even though observable evidence of this learning outcome can become more apparent as the class progresses, it is difficult to construct ways of assessing and measuring the degree to which this learning outcome is a product of the class in which it is observed as opposed to a learning outcome which students had already achieved prior to involvement in the class.

7. **Describe a discipline accomplishment that you want to share with the college community.**
- First students have graduated from our newly formed AA degree in Networking.
- Created new degree program in Computer Science with an emphasis in Video Gaming.
- Created the following certificate programs effective Fall 2008:
    - Java Software Development
    - Mac Programming

- Web 2.0
- Network Administration with Emphasis in Microsoft and Linux Management
- Network Administration with Emphasis in Cisco and Linux Management
- Network Administration with Emphasis in Cisco and Microsoft Management

**8.     Are there other resources (including data) that you need to complete your discipline review and planning?**

None.

**9.     For programs with an external accreditation, indicate the date of the last accreditation visit and discuss recommendations and progress made on the recommendations.**

None.

**10.    Other comments, recommendations:**

The CSIS department has entered into academic partnerships with Microsoft, Oracle, Cisco, and CompTIA to provide a cost-effective means of introducing the latest technologies into our curriculum. It positions Palomar College on the cutting edge of technology education and innovation and enhances our ability to attract students by offering the latest in technology courseware.

These academic partnerships are designed to help increase the number of skilled IT workers by preparing students for a wide range of careers in Computer Science, Information Technology, Database, Networking and Web Technology. To accomplish this goal CSIS has expanded its programs in a career-ladder approach.  We have established an entry-level program that provides students with a certificate and employable skills in one semester or less.  We've then build on this base by providing opportunities for somewhat longer programs that would lead to more responsible and higher paying jobs in systems management and Internet related occupations.  Finally, for those students interested in even more challenging careers, we are directing the students into additional CSIS degree and certificate programs. Students could enter this ladder at any point depending upon their prior experience and knowledge.

This approach should provide students, especially disadvantaged students, with high-quality, entry-level jobs while offering opportunities for upward mobility for more experienced workers and students who can afford to spend additional time acquiring the skills needed to achieve their goals.  As previously stated, our programs are in great demand in business and industry within the North County San Diego area served by the Palomar College District.

Once again we must emphasize that in order to be able to develop and support curricula that attracts and retains students, the CSIS Department must have the necessary, on-going financial support to maintain our computer laboratories. Without this support, the department's ability to accomplish its goals is significantly diminished. This is the most crucial issue that the CSIS department has had to deal with in the past and will remain crucial for the survival of its programs. The CSIS department would welcome the opportunity to explore with administration the possibility of formalizing such a plan.

Finally, one thing that is certain in the field of Information Technology is that information and technology will change. If the CSIS faculty has any chance of remaining current in their field, they must be given the opportunity, on a fairly regular basis, to upgrade their skills. We propose that CSIS faculty be offered a one-semester sabbatical leave every three or four years. Additionally, due to the enormous demands made upon the CSIS chair, it is crucial that the chair release time from classroom activity be increased to 80%. In the two or three years that one spends as chair administering the department and teaching the required classes, one can often find that technology has passed them by. Two or three years in information technology is a very long time and without the opportunity to keep abreast of changes in the field and learn new technologies, one can gain a sense of technological obsolescence.

**Please identify faculty and staff who participated in the development of the reviewer's planning:**

Richard Stegman    Walter Pistone    Rand Green    Steve Perry    Ron Burgher                    Anthony Smith        William McGinnis

**Department Chair/Designee Discipline Review and Signature**
**\* By no later than 2/14/08, forward a hard copy to Instructional Services for review by IPC.**
**\* Also, by no later than 2/14/08, forward an electronic copy to Institutional Research and Planning.**