



Assessment of Learning Report

Computer Science Networking CPC

Fall 2006 – Spring 2008

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I. Introduction and Background

St. Charles Community College Mission Statement

St. Charles Community College is an affordable, and accredited, accessible learning environment providing life-changing opportunities for personal growth and professional success.

Computer Science Mission Statement

The Computer Science Program's mission is to offer both academic and vocational computer science programs that are responsive to the information technology needs of business and industry, as well as responsive to the personal and professional objectives of our students. We are committed to excellence in instruction and will recruit and retain a professional faculty imbued with real world, cutting edge experience and expertise.

Course Prefixes

The CPC prefix is being used to exclusively define computer networking courses. CPT 107 is the only course within computer networking that does not have a CPC prefix. CPT 107 is a more general course covering computer repair and maintenance along with preparation for an A+ industry-recognized certification.

Overview of the Computer Networking Program

The Computer Science program has been divided into two broad areas:

- Computer Networking (which this report addresses)
 - Cisco Networking Academy
 - Microsoft Networking
 - Computer Repair and Maintenance
- Computer Science
 - Business Computing
 - Computer Programming
 - Database Management
 - Multimedia & Web Design
 - Telecommunications

Computer Networking Degrees and Certificates

The following degrees and certificates are currently offered:

- Associate of Applied Science
 - Networking (includes Microsoft and Cisco networking)
- Certificates of Achievement
 - Computer Technician (A+ and basic networking)
 - Advanced Networking (advanced Microsoft and Cisco networking)

Associate of Applied Science Degree Networking		
Course	Title	Credit Hours
General Education Requirements (24 credit hours) Includes CPT 115: Introduction to Data Processing and MAT 121: Intermediate Algebra		
Core Requirements		
CPT 103	Microcomputer Applications*	3
CPT 106	PC Operating Systems*	3
*CPT 103 & CPT 106 may be waived by instructor permission		
CPC 125	Windows XP Professional	3
CPT 105	Computer Ethics	3
A+ Certification		
CPT 107	A+ (Computer Repair & Maintenance)	5
Cisco Certification - CCNA		
CPC 170	CCNA1	5
CPC 171	CCNA2	5
CPC 172	CCNA3	5
CPC 173	CCNA4	5
Microsoft Certification (MCP)		
CPC 202	Windows Server	5
CPC 225	Microsoft Exchange Server	3
UNIX		

CPT 130	UNIX	3
Total Required Credit Hours		66-72*

Certificate of Achievement Networking		
Course	Title	Credit Hours
General Education Requirements (12 credit hours) Includes CPT 115: Introduction to Data Processing		
Core Requirements		
CPT 103	Microcomputer Applications*	3
CPT 106	PC Operating Systems*	3
*CPT 103 & CPT 106 may be waived by instructor permission		
CPC 125	Windows XP Professional	3
CPT 107	A+ (Computer Repair & Maintenance)	5
CPC 170	CCNA1	5
CPC 202	Windows Server	5
Total Required Credit Hours		30-36*

Certificate of Achievement Advanced Network Design		
Prerequisite: AAS Degree in Networking OR CCNA and MCP certification.		
Course	Title	Credit Hours
CCNP		
CPC 270	BSCI	5
CPC 272	BCMSN	5
CPC 275	ISCW	5
CPC 276	ONT	5
Microsoft		

CPC 224	Microsoft SQL Server	3
CPC 252	Designing Security for a Windows 2000 Network	3
CPC 253	Designing a Windows 2000 Directory Services Infrastructure	3
CPC 254	Designing a Windows 2000 Network Infrastructure	3
Total Required Credit Hours		32

Program Goals and Objectives

The computer networking program is comprised of three overlapping areas with the goals and objectives listed below:

A+: Computer Repair and Maintenance

- Identify basic terms, concepts, and functions related to computer repair and maintenance
- Identify basic procedures for adding and removing field replaceable modules in computers
- Install and configure peripheral devices such as printers, modems, and external storage devices
- Install and configure internal devices such as hard drives, sound cards, and network cards
- Identify and install RAM
- Identify the most popular types of motherboards
- Troubleshoot common symptoms and problems associated with computer malfunctions. Identify basic concepts and procedures with operating systems such as DOS, Windows 98, Windows 2000, and Windows XP.

Microsoft Networking

- Installing Windows XP Professional and Server 2003
- Implementing and conducting administration of resources
- Implementing, managing, and troubleshooting hardware devices and drivers
- Monitoring and optimizing system performance, reliability, and availability
- Optimizing and troubleshooting performance of the Windows XP desktop
- Implementing, managing, and troubleshooting network protocols and services
- Implementing, configuring, managing, and troubleshooting local security policy
- Managing, configuring, and troubleshooting storage use
- Configuring and troubleshooting Windows network connections
- Implementing and managing Active Directory
- Integrating the Domain Name System with Active Directory
- Implementing and Configuring Group Policy

Cisco Networking Academy

- Computer hardware and software, electricity, networking terminology, and protocols
- LANs and WANs, Open Systems Interconnection (OSI) model, Ethernet, and Internet Protocol (IP) addressing
- Design and documentation of a basic network and structured cabling
- Network-to-network communications
- Router user interfaces, components and configurations
- Basics of IOS versions, naming and software backup
- TCP/IP Protocol Suite and IP addressing and subnetting
- Interior routing protocols—RIP, IGRP
- Switching and VLANs

- Spanning-Tree Protocol
- Routing and Routing Protocols
- Access Control Lists (ACLs)
- Network documentation, security and troubleshooting
- WAN devices, encapsulation formats, and communication
- PPP components, session establishment, and authentication
- ISDN uses, services, and configuration
- Frame relay technology and configuration

Academic Assessment Plan

The computer networking program prepares students in two ways:

- General education course work to train students in reading, writing, analysis/critical thinking, and decision-making.
- Program specific training in computer repair and maintenance, Microsoft networking, and Cisco networking thru the Cisco Networking Academy.

Therefore, the computer networking assessment plan consists of the following:

- ACT WorkKeys to evaluate general education course work.
 - Reading for Information
 - Computerized multiple choice test that contains 33 problems to be completed in 55 minutes. An acceptable student score is from level three through seven, with seven being the highest. Students are reading passages from actual workplace business documents and are expected to respond to questions about the content of these documents. Reading skills and analysis/decision-making skills are measured by their answers.
 - Locating Information
 - Computerized multiple choice test that contains 38 problems to be completed in 55 minutes. An acceptable student score is from level three thru six, with six being the highest. Students are observing workplace documents containing graphics, forms, charts, tables, etc., and are expected to glean information from these documents to answer questions accurately and in a timely manner. These skills are needed by SCC graduates every day in the workplace.
- A average of four final grade assessments assigned as part of the Cisco Networking Academy at the conclusion of each quarter of training.
 - Final grade assessments are based on the criteria defined by each instructor but usually include the following elements:
 - Module exams
 - Online final exam
 - Skills-based assessment exam
 - Final grade assessment scores may range from 0 to 100.

- Assessments occur in a proctored environment.
- The skills listed under Program Goals and Objectives above are evaluated.
- Assessments include multiple choice, multiple guess, drag and drop, Flash-generated forms that go beyond traditional, computer-based testing, and a hands-on, skills-based comprehensive assessment.

II. Data and Results

The following table includes students who completed the program in Fall 2006 thru Spring 2008. Many computer networking students are seeking job skills to enhance their current career and not on a degree track. They attend specific classes relevant to their career field. Also, many students declared degrees when they first enrolled in a class at SCC but have not updated that information. It is quite likely that their choice of degree has changed since then as can be seen in this table. Finally, students are not required but encouraged to take the WorkKeys exams, so information is not available for all students.

Assessment Data for Computer Networking				
Student ID	Declared Major	Locating Information	Reading for Information	Final Grade Assessment
xxxxxxx	CER.CPND	5	6	94
xxxxxxx	SELECTED	6	7	94
xxxxxxx	AAS.CPN		6	93
xxxxxxx	AAA.GENED	4	4	86
xxxxxxx	SELECTED	5	5	96
xxxxxxx	AAA.CPN			79
xxxxxxx	AAS.CPN	5	6	91
xxxxxxx	SELECTED			84
xxxxxxx	SELECTED	5	6	97
xxxxxxx	SELECTED	5	6	76
xxxxxxx	CER.CPND	5	6	95
xxxxxxx	SELECTED			86
xxxxxxx	CER.NW	5	6	96
xxxxxxx	SELECTED			91
xxxxxxx	SELECTED	4	5	82
xxxxxxx	AAA.CNDAS			92
xxxxxxx	SELECTED		6	90
xxxxxxx	AAS.CPN	5	6	92
xxxxxxx	SELECTED	5	6	94
xxxxxxx	SELECTED			76
xxxxxxx	SELECTED	4	6	98
xxxxxxx	AAS.AOM	4	4	96
xxxxxxx	AAS.CPN	5	6	80
xxxxxxx	AAA.GENED			86
xxxxxxx	AAA.CPT	4	4	75
xxxxxxx	SAS.EGR	3	4	94
xxxxxxx	CER.NW	4	6	92
xxxxxxx	AAA.MAT			88
xxxxxxx	AAA.GENED			88
xxxxxxx	AAS.CPN	5	7	86
xxxxxxx	AAS.CPN	5	6	80
xxxxxxx	AAS.CPN			84
xxxxxxx	AAS.CPN			78

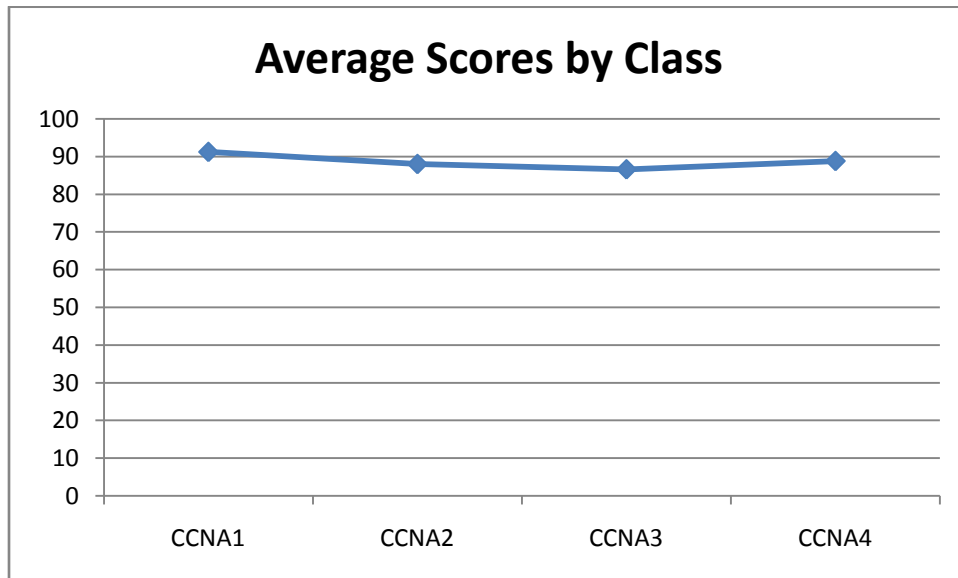
xxxxxxx	SELECTED	5	6	97
xxxxxxx	SELECTED	5	5	96
xxxxxxx	AAS.MAR			88
xxxxxxx	UNDEC	4	5	79
xxxxxxx	SELECTED	4	4	88
xxxxxxx	SELECTED	5	6	92
xxxxxxx	CER.NW	5	7	92
xxxxxxx	SELECTED			86
xxxxxxx	AAA.ACT	6	6	91
xxxxxxx	AAA.GENED	5	4	87
xxxxxxx	AAA.CPT	4	5	76
xxxxxxx	AAS.CPN	4	4	83
xxxxxxx	SELECTED	5	6	91
xxxxxxx	PRECDM	6	7	95
xxxxxxx	CER.CPAND			96
xxxxxxx	AAA.CPT	5	6	85
		4.7	5.6	88.4

III. Data Analysis and Interpretation

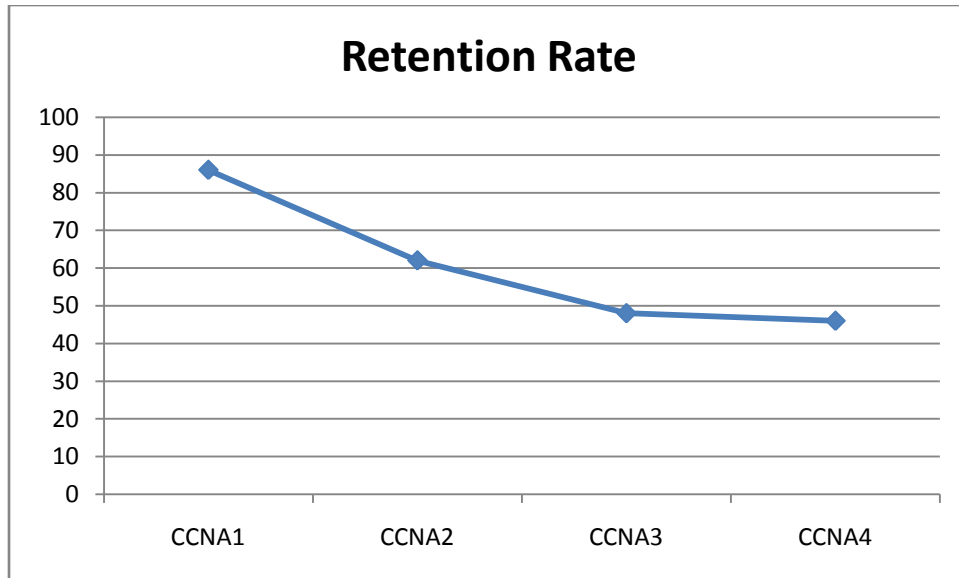
Students scored very well on the ACT WorkKeys assessments. All students scored above the minimum requirement. These are encouraging results since students within the computer networking program must be able to document their networks, create charts and graphs, analyze data, and so forth. The average score for Locating Information was the same as in the last report at 4.7. The average score for Reading for Information went up from 4.8 to 5.6.

Final Grade Assessments for those completing CCNA1 through CCNA4 were very strong with an average score of 88, down slightly from 91. A passing score would be a 70 or above. Scores ranged from 75 to 98 as compared to 80 thru 97 in the prior report.

The chart below shows the average score by class for all students that completed all four CCNA classes during this reporting period. Average scores have been relatively constant.



The following chart shows the number of students that completed CCNA1 thru CCNA4. Students begin with CCNA1 and progress through the sequence in order by finishing with CCNA4. The retention rate stabilizes in the second half of the training. Students consider the curriculum challenging.



- 86 students completed CCNA1
- 62 students completed CCNA2 (28% drop rate)
- 48 students completed CCNA3 (23% drop rate)
- 46 students completed CCNA4 (4% drop rate)

53% of our students completed the four-course sequence. In the prior reporting period, 60% of our students completed the four-course sequence. A large number of our students rely on tuition reimbursement programs through their employer. As a result, our enrollments depend heavily on the state of the economy which affects training budgets at many companies.

IV. Discussion of Data with IT Advisory Council and Program Faculty

IT Advisory Council Discussions

Soft skills that are considered important by our IT Advisory Council include communication skills, email skills, telephone etiquette, team building skills, interpersonal skills, time management, interviewing skills, interactive skills, troubleshooting skills, ethics, project management, project budgeting, presentation skills, customer service skills, and a good resume. These have been addressed within our classes in the following ways:

- The curriculum already contains Case Studies that require extensive documentation, troubleshooting skills, and project management in order to complete within the timeframe required.
- Use of project management software has not been offered but has been considered. The number of credit hours required to complete our current degree and certificate programs does not allow the addition of more classes.
- Students are required to work and communicate in team settings in many of our classes.
- Case Study projects are frequently completed in a team or group setting.
- The lab environment frequently requires working together in groups either formally or informally.

IT Advisory Council members were asked about their hiring practices. These are some of the responses:

- College interns are hired on a rotational basis.
- Four-year degree hires are considered more promotable.
- Won't hire anyone without an A+ certification.
- Certifications add value to the job and are more applicable
- Associate degree hires are more likely to work help desk positions

Most of our classes target not only job skills but also the most sought-after industry certifications.

Many IT Advisory Council members felt that the job market was beginning to open up a bit. They indicated that IT jobs are everywhere in every business. The IT workforce is aging which should result in a greater need for new hires.

Council members were asked about plans to implement the Vista operating system. Most companies are moving slow towards migration.

Network security is considered extremely important to Council members.

Course offerings have been adjusted due to changes in the IT job market. Network security courses are now being offered. Cisco announced three new CCNA specialty certifications: voice, wireless, and security. It has not been determined how to address these new areas at this time.

V. Implication for Improvements or Changes

The following implications for improvement or changes have been noted:

- The new CCNA specialties – Security, Voice, and Wireless – are important subjects that need further study and consideration.
- Students need to continue to develop their soft skills thru team projects and working together.
- Students need to continue to develop their abilities to document information.
- Troubleshooting skills need to continue to be a focus in training.
- A larger database is necessary to add validity to the results of the assessment process. Most of our students are taking specific classes rather than targeting a degree. We are now assessing all computer networking students and not just those seeking a degree.
- Hybrid classes may better meet the needs of some working adult learners.
- Certifications and degrees are both important to employers.

VI. Action Steps

The following action steps are planned:

- Cisco is planning an announcement soon about additional new curricula to target the new CCNA specialties in order to address the changing needs within the IT industry. Once Cisco's direction is announced, we will evaluate what our next actions should be.
- Group or team activities are being emphasized.
- Case studies requiring documentation that includes writing skills, organizational skills, creation of tables, charts, and graphics are included in the curriculum.
- All students, whether degree-seeking or not, will be included in the assessment process for future reports and evaluation.
- Hybrid class formats are being offered in CCNA and A+ (Computer Repair) to better meet the needs of working adult learners.
- Many marketing and promotional events will be conducted to promote the program. These will include newspaper advertisements, on-line advertising, press releases, internal promotion and cross-promotion among classes.
- Seminar events will be hosted to promote the program both internally and externally.
- Students do not already possess a college degree will be encouraged to work towards and AAS degree in addition to earning certifications.