**Sacramento City College**

Phone: (916) 558 – 2111

Catalog: http://www.scc.losrios.edu/current\_students/from\_enrollment\_to\_graduation/catalog.htm

Website: www.scc.losrios.edu

**Computer Science – Associates (Transfer), Certificate**

**Program Information**

The Computer Information Science program is designed for stu­dents preparing for careers in computer programming and systems analysis. It provides a foundation in currently used and advanced programming languages. It will enhance students’ skills so that they can transfer to four-year universities or qualify as entry-level programmers who pursue careers in the computer industry.

**Career Opportunities**

Technical positions include computer operator, computer program­mer, system analysts, database administrators, computer support, or help desk specialists, Web developers, and application develop­ers. Opportunities in networking include network support specialists, network administrators and technicians, network security special­ist, computer forensics specialist, Webmasters, Web developers, and Web site designers.

**Upon completion of this program, the student will be able to:**

• analyze development projects and divide them into smaller production tasks.

• build a project while utilizing the project development model.

• manage a programming project, both individually and as a member of a team, from initial concept through design, programming, debugging, testing, and deployment.

• evaluate a program to determine how it will meet the needs of its intended audience.

• design, write, test, debug, and implement computer programs in a structured language, a low-level language, and an object-oriented language.

• create programs utilizing both Windows and Linux operating systems.

**Database Management – Certificate**

**Program Information**

The Computer Information Science program is designed for stu­dents preparing for careers in computer programming and systems analysis. It provides a foundation in currently used and advanced programming languages. It will enhance students’ skills so that they can transfer to four-year universities or qualify as entry-level programmers who pursue careers in the computer industry.

**Career Opportunities**

Technical positions include computer operator, computer program­mer, system analysts, database administrators, computer support, or help desk specialists, Web developers, and application develop­ers. Opportunities in networking include network support specialists, network administrators and technicians, network security special­ist, computer forensics specialist, Webmasters, Web developers, and Web site designers.

**Upon completion of this program, the student will be able to:**

• analyze development projects and divide them into smaller production tasks.

• build a project while utilizing the project development model.

• manage a programming project, both individually and as a member of a team, from initial concept through design, programming, debugging, testing, and deployment.

• evaluate a program to determine how it will meet the needs of its intended audience.

• design, write, test, debug, and implement computer programs in a structured language, a low-level language, and an object-oriented language.

• create programs utilizing both Windows and Linux operating systems.

**Information Processing – Associates**

**Program Information**

This degree combines microcomputer software proficiencies and competencies in hardware support, maintenance, and repair with general education requirements. Students will be able to incorpo­rate three inter-related certificates (Word Processing Technician, Information Processing Technician, and Information Processing Specialist) as major fields of study with course work in natural sci­ence, social science, humanities, languages and rationality, and living skills to earn an Associate in Science degree in Information Processing.

**Career Opportunities**

Students who have obtained certificates (Word Processing Techni­cian, Information Processing Technician, and Information Process­ing Specialist) are interested in attaining associate degrees for continued job advancement. Many employees with advance soft­ware proficiencies and competencies in hardware support, mainte­nance, and repair are considered top candidates for supervisory or managerial positions. Such positions include: office supervisors, office managers, com­puter support specialists, or information processing specialists. Based on Bureau of Labor Statistics (2002-2012) figures, job de­mands in these areas will grow approximately 19.2% and will con­tinue to exceed the number of available and trained workers.

**Upon completion of this program, the student will be able to:**

• demonstrate creativity, critical thinking, ethical behavior, and self-understanding that are essential to the attainment of personal goals.

• demonstrate an appreciation for the individual, society, and human heritage and be aware of the impact of their work on society and the environment.

• communicate effectively through speaking, writing, and the use of professional tools.

• recognize and demonstrate an appreciation of the need for life-long learning and continual professional development.

• demonstrate an understanding of the diverse field of human knowledge in natural science, social science, humanities, language and rationality, and living skills.

• demonstrate an understanding of professional ethics and responsibilities and the impact of the professional on society.

• demonstrate an understanding of global, ethical, and societal concerns relating to the impact of computers.

• adapt to technological changes and innovations in computers and use the techniques, skills, and tools necessary to meet needs.

• analyze needs, design solutions, and implement necessary microcomputer applications or processes to on-the-job problems in a team environment using appropriate diagnostic tools.

**Information Processing Specialist – Certificate**

**Program Information**

This degree combines microcomputer software proficiencies and competencies in hardware support, maintenance, and repair with general education requirements. Students will be able to incorpo­rate three inter-related certificates (Word Processing Technician, Information Processing Technician, and Information Processing Specialist) as major fields of study with course work in natural sci­ence, social science, humanities, languages and rationality, and living skills to earn an Associate in Science degree in Information Processing.

**Career Opportunities**

Students who have obtained certificates (Word Processing Techni­cian, Information Processing Technician, and Information Process­ing Specialist) are interested in attaining associate degrees for continued job advancement. Many employees with advance soft­ware proficiencies and competencies in hardware support, mainte­nance, and repair are considered top candidates for supervisory or managerial positions. Such positions include: office supervisors, office managers, com­puter support specialists, or information processing specialists. Based on Bureau of Labor Statistics (2002-2012) figures, job de­mands in these areas will grow approximately 19.2% and will con­tinue to exceed the number of available and trained workers.

**Upon completion of this program, the student will be able to:**

• demonstrate creativity, critical thinking, ethical behavior, and self-understanding that are essential to the attainment of personal goals.

• demonstrate an appreciation for the individual, society, and human heritage and be aware of the impact of their work on society and the environment.

• communicate effectively through speaking, writing, and the use of professional tools.

• recognize and demonstrate an appreciation of the need for life-long learning and continual professional development.

• demonstrate an understanding of the diverse field of human knowledge in natural science, social science, humanities, language and rationality, and living skills.

• demonstrate an understanding of professional ethics and responsibilities and the impact of the professional on society.

• demonstrate an understanding of global, ethical, and societal concerns relating to the impact of computers.

• adapt to technological changes and innovations in computers and use the techniques, skills, and tools necessary to meet needs.

• analyze needs, design solutions, and implement necessary microcomputer applications or processes to on-the-job problems in a team environment using appropriate diagnostic tools.

**Information Processing Technician – Certificate**

**Program Information**

This information processing technician certificate builds upon pre­vious training in the use of word processing programs. As employ­ees become more proficient with basic entry-level skills in word processing, advancement in the work place requires competencies in other microcomputer software programs. These include skills in the operating system, spreadsheet, database management, graph­ics, and the use of the Internet. This certificate is designed for students interested in job advance­ment requiring additional computer skills.

**Career Opportunities**

Students who are currently employed in entry-level office-related jobs (many of which use word processing skills) are interested in opportunities for advancement. These positions usually require competencies in additional microcomputer applications courses in the Windows operating system, spreadsheet, database manage­ment, graphic presentations, and the use of the Internet. Such positions include: health information technicians, customer or client service representatives, and customer support special­ists. Based on Bureau of Labor Statistics (2002-2012) figures, job demands in these areas will grow from a low of 24% to a high of 47%, and will continue to exceed the number of available and trained workers.

**Upon completion of this program, the student will be able to:**

• demonstrate proficiency in Windows operating system commands, programs, file and folders management, storage, and utilities.

• identify on-the-job problems, projects, presentations, and assignments and design appropriate software solutions or tools.

• evaluate effectiveness of software solutions and implement suitable software changes, enhancements, or improvements.

• design and implement data management systems involving queries, data entry, screen, forms, tables, reports, and labels.

• explain and use asynchronous and synchronous communication tools.

• identify Internet laws, guidelines, security and privacy issues and determine specific on-the-job applications.

**Information Systems Security – Associates, Certificate**

**Program Information**

Information systems security has become a critical knowledge area for those interested in a career as an information technology pro­fessional. This degree provides the information and skills necessary for network administration professionals to implement security from internal and external threats for an enterprise network. It cov­ers client and server security on different operating systems, disas­ter recovery planning, and forensics. This program also provides preparation for several computer information security certification exams, including the Computer Technology Industry Association (CompTIA) Security+ exam, Microsoft Certified Systems Engineer (MCSE) exams, and several of the Certified Information Systems Security Professional (CISSP) certification exams.

**Career Opportunities**

Information Security Systems Specialist, Computer Technician, Network Administrator, Network Systems Engineer.

**Upon completion of this program, the student will be able to:**

• develop best practices for configuring network operating system services to provide optimum security.

• compare and contrast the benefits of firewalls vs. intrusion detection devices and software.

• analyze organizational needs and implement internal security policies for the enterprise.

• evaluate and implement the required security programs and policies to protect the enterprise against viruses, Trojans, worms, rootkits, and spyware.

• construct file system permissions and share permissions to allow only the minimum levels of access needed by users to use network resources.

• prioritize and establish a disaster recovery plan for the enterprise.

• explain and configure a network firewall to provide optimum security from external threats and exploits.

• construct and apply group policies and file system permissions to secure files and network resources.

**Network Administration – Certificate, Associates**

**Program Information**

Information systems security has become a critical knowledge area for those interested in a career as an information technology pro­fessional. This degree provides the information and skills necessary for network administration professionals to implement security from internal and external threats for an enterprise network. It cov­ers client and server security on different operating systems, disas­ter recovery planning, and forensics. This program also provides preparation for several computer information security certification exams, including the Computer Technology Industry Association (CompTIA) Security+ exam, Microsoft Certified Systems Engineer (MCSE) exams, and several of the Certified Information Systems Security Professional (CISSP) certification exams.

**Career Opportunities**

Information Security Systems Specialist, Computer Technician, Network Administrator, Network Systems Engineer.

**Upon completion of this program, the student will be able to:**

• develop best practices for configuring network operating system services to provide optimum security.

• compare and contrast the benefits of firewalls vs. intrusion detection devices and software.

• analyze organizational needs and implement internal security policies for the enterprise.

• evaluate and implement the required security programs and policies to protect the enterprise against viruses, Trojans, worms, rootkits, and spyware.

• construct file system permissions and share permissions to allow only the minimum levels of access needed by users to use network resources.

• prioritize and establish a disaster recovery plan for the enterprise.

• explain and configure a network firewall to provide optimum security from external threats and exploits.

• construct and apply group policies and file system permissions to secure files and network resources.

**Network Design – Certificate, Associates**

**Program Information**

The Network Design Degree and Certificate of Achievement recognize the basic skills needed in the networking environment. Focus is on the knowledge and skills required for day-to-day opera­tion and management of computer networks. The Network Design Degree and Certificate of Achievement prepare students for entry-level positions in computer network design.

**Career Opportunities**

Network technical support staff, network administrators, network designers, network troubleshooters, and information systems secu­rity specialists.

**Upon completion of this program, the student will be able to:**

• develop best practices for configuring IP addresses.

• evaluate and implement technologies to support IP routing protocols such as RIP, IGRP, and OSPF.

• construct and configure access lists.

• compare and contrast types of network media.

• demonstrate working knowledge of principles in computer networking and data management, or information systems security, or web server administration, depending on the electives chosen.

• demonstrate competency in Windows operating system terminology and commands, account management, and file management and storage.

**Microcomputer Technician – Certificate, Associates**

**Program Information**

This degree focuses on the use of the microcomputer and current, commonly used software to solve problems in a business environment. Course work includes microcomputer applications in database management, desktop publishing, electronic spreadsheets, presentation graphics, operating systems, word processing, and at least one programming language.

**Career Opportunities**

This program is designed for Electronics Technology and Comput­er Information Science students pursuing employment in the area of programming and maintaining microcomputer systems.

**Upon completion of this program, the student will be able to:**

• use the operating system on a personal computer to manipulate files and folders.

• use the operating system on a personal computer to configure hardware and applications.

• explain common computer terminology used in computer information science and electronics technology.

• diagnose common computer errors that occur because of hardware, software, or network problems.

• predict common computer error solutions in hardware, software, or network systems.

• resolve common computer errors that occur in hardware, software, or network systems.

**Automated System Technician – Associates, Certificate**

**Program Information**

Designed to prepare students for employment in the programming, testing, repair and maintenance of digital and analog computer controlled systems

**Career Opportunities**

The Engineering Associate in Science degree is designed to meet lower division requirements for various majors in engineering. Completion of the Associate in Science degree should qualify the student to transfer at the upper division level to an engineering program at a four-year institution. The degree has a common en­gineering core requirement as well as specific field requirements. The specific field requirements do vary depending on the four-year institution to which the student will transfer. Thus, requirements for specific universities should be checked before selecting specific field courses.

**Upon completion of this program, the student will be able to:**

• demonstrate safe work practices for automated systems equipment.

• demonstrate the proper use of basic test equipment to include DMM, oscilloscopes, and digital or analog signal sources.

• use a standard schematic diagram of an automated system to identify its digital or analog parts.

• explain common automated systems terminology for digital and analog devices.

• estimate automated system circuit performance using mathematical tools

• analyze and compare calculated automated system circuit performance to actual performance.

• measure common automated system parameters using appropriate test equipment.

• set up and install basic automated system equipment

• design proper preventive maintenance, calibration and system testing procedures for automated equipment

• perform proper preventive maintenance, calibration and system testing on automated equipment.

• diagnose common automated system failures down to the source of the problem.

• solve automated system problems by replacing failed hardware or software parts.

**Electrical Engineer/Computer Engineering – Associates**

**Program Information**

SCC’s program provides the foundation in mathematics, physics, and engineering necessary to transfer to a four-year institution and complete a bachelor’s degree in engineering. Students should consult the institution to which they wish to transfer for the specific lower division requirements. This degree and certificate emphasizes the knowledge and skills required for entry level success in the engineering professions. These include a basic preparation within the scientific fields including physics, mathematics, chemistry, and material sciences. These sciences are applied to technical analysis and graphic communication standards and practices. In addition, projects include environmental and sustainable design issues, product economics, and legal considerations. Current computer technologies and various analytical design and documentation software are emphasized throughout the program.

**Career Opportunities**

The Engineering Associate in Science degree is designed to meet lower division requirements for various majors in engineering. Completion of the Associate in Science degree should qualify the student to transfer at the upper division level to an engineering program at a four-year institution. The degree has a common en­gineering core requirement as well as specific field requirements. The specific field requirements do vary depending on the four-year institution to which the student will transfer. Thus, requirements for specific universities should be checked before selecting specific field courses.

**Upon completion of this program, the student will be able to:**

• Apply the principles of engineering.

• Identify, analyze, and solve technical problems.

• Plan, conduct, analyze, and interpret experiments.

• Communicate about engineering solutions effectively through speaking, writing, and graphics.

**Mechanical Engineering – Associates**

**Program Information**

SCC’s program provides the foundation in mathematics, physics, and engineering necessary to transfer to a four-year institution and complete a bachelor’s degree in engineering. Students should consult the institution to which they wish to transfer for the specific lower division requirements. This degree and certificate emphasizes the knowledge and skills required for entry level success in the engineering professions. These include a basic preparation within the scientific fields including physics, mathematics, chemistry, and material sciences. These sciences are applied to technical analysis and graphic communication standards and practices. In addition, projects include environmental and sustainable design issues, product economics, and legal considerations. Current computer technologies and various analytical design and documentation software are emphasized throughout the program.

**Career Opportunities**

The Engineering Associate in Science degree is designed to meet lower division requirements for various majors in engineering. Completion of the Associate in Science degree should qualify the student to transfer at the upper division level to an engineering program at a four-year institution. The degree has a common en­gineering core requirement as well as specific field requirements. The specific field requirements do vary depending on the four-year institution to which the student will transfer. Thus, requirements for specific universities should be checked before selecting specific field courses.

**Upon completion of this program, the student will be able to:**

• Apply the principles of engineering.

• Identify, analyze, and solve technical problems.

• Plan, conduct, analyze, and interpret experiments.

• Communicate about engineering solutions effectively through speaking, writing, and graphics.

**Electric (Power/Lighting Systems) – Associates, Certificate**

**Program Information**

Designed for students pursuing employment or upgrade in em­ployment in Manual and CAD drafting applications in Architectural or Structural Engineering related offices.

**Career Opportunities**

Designed for students pursuing employment or upgrade in em­ployment in Manual and CAD drafting applications in Architectural or Structural Engineering related offices.

**Upon completion of this program, the student will be able to:**

• prepare architectural, mechanical and electrical plans for buildings that conform with current industry standards

• demonstrate an understanding of the process of architectural design, mechanical design and electrical design by applying design principles to building design projects

**Mechanical (HVAC/Plumbing Systems) – Associates, Certificate**

**Program Information**

Designed for students pursuing employment or upgrade in em­ployment in Manual and CAD drafting applications in Architectural or Structural Engineering related offices.

**Career Opportunities**

Designed for students pursuing employment or upgrade in em­ployment in Manual and CAD drafting applications in Architectural or Structural Engineering related offices.

**Upon completion of this program, the student will be able to:**

• prepare mechanical and plumbing plans for buildings that conform with current industry standards.

• demonstrate an understanding of the process of mechanical and plumbing design by applying design principles to building design projects.

**HVAC Systems Design – Associates, Certificate**

**Program Information**

This program is designed for students pursuing employment or up­grade in training in computer applications of heating, ventilation, and air conditioning (HVAC) systems design.

**Career Opportunities**

This program is designed for students pursuing employment or up­grade in training in computer applications of heating, ventilation, and air conditioning (HVAC) systems design.

**Upon completion of this program, the student will be able to:**

• prepare mechanical designs (HVAC) for buildings that conform with current industry standards.

• demonstrate an understanding of the process of mechanical design (HVAC) by applying design principles to building design projects.