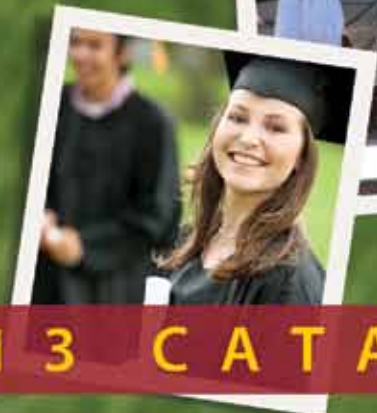
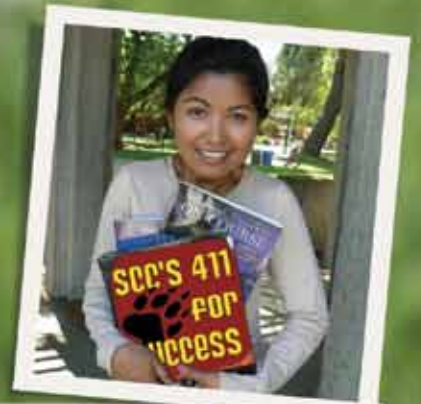


# SACRAMENTO CITY COLLEGE



2012-2013 CATALOG

Computer Information Science

**Degrees:**

- A.S. - Computer Science
- A.S. - Management Information Science
- A.S. - Information Processing
- A.S. - Information Systems Security
- A.S. - Network Administration
- A.S. - Network Design
- A.S. - Web Developer

**Certificates of Achievement:**

- Computer Science
- Management Information Science
- Programming
- Information Processing Specialist
- Information Processing Technician
- Information Systems Security
- Word Processing Technician
- Network Administration
- Network Design
- Advanced CISCO Networking
- PC Support
- Active Server Pages Developer
- Web Developer
- Webmaster, Level 1
- Webmaster, Level 2

**Division of Business**

Deborah Saks, Dean  
Business Building 213  
916-558-2581

**Certificate:**

International Computer Driving License

## Computer Science

Associate in Science Degree  
Certificate of Achievement

**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 analyst, database administrator, computer support, or help desk specialist, Web developer, and application developer. Opportunities in networking include: network support specialist, network administrator and technician, network security specialist, computer forensics specialist, Webmaster, Web developer, and Web site designer.

**Transfer Information**

California State University, Sacramento offers majors in Computer Science and Computer Engineering through the School of Engineering and Computer Science and also Management Information Science as part of the Business Administration degree. Students planning to transfer to California State University, Chico or California State University, Sacramento should include computer-programming languages in C++, Java, or Visual BASIC, assembly language, data structures, discrete structures, one year of analytical geometry and calculus, and physics. Students must also meet university admission requirements and other general education courses as outlined by each university. Consultation with an SCC counselor is advised.

**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.
- use a database to store data associated with programs written in a programming language.
- 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.

**Required Program****Units**

CISC 310 Introduction to Computer Information Science.....	3
CISP 301 Algorithm Design and Implementation.....	4
CISC 323 Linux Operating System .....	1
CISC 324 Intermediate Linux Operating System .....	1
CISP 360 Introduction to Structured Programming .....	4
CISA 323 Database Management using Microsoft Access .....	2
CISA 324 Database Management using SQL.....	2
CISP 310 Assembly Language Programming for Microcomputers.....	4
CISP 400 Object Oriented Programming with C++ (4).....	4
or CISP 401 Object Oriented Programming with Java (4)	
CISP 430 Data Structures.....	4
A minimum of 6 units from the following:.....	6 <sup>1</sup>
CISC 351 Introduction to Local Area Networks (1)	
CISC 355 Introduction to Data Communications (1.5)	
CISN 303 Network Administration - Linux Server (3)	
CISP 350 Database Programming (3)	
CISP 370 Beginning Visual Basic (4)	
CISP 401 Object Oriented Programming with Java (4)	
CISP 440 Discrete Structures for Computer Science (3)	
CISP 452 Introduction to Systems Programming (3)	
CISP 457 Computer Systems Analysis and Project Management (3)	
CISS 300 Introduction to Information Systems Security (1)	
CISS 301 Ethical Hacking (2)	
CISS 310 Network Security Fundamentals (3)	
CISW 320 Introduction to Web Site Development (3)	
CISW 325 Intermediate Web Site Development (4)	
CISW 410 Middleware Web Scripting (4)	

**Total Units Required****35**

<sup>1</sup>SCC transfer students to California State University, Sacramento, who are majoring in Computer Science or Computer Engineering should take CISP 440 and CISP 452. Computer Engineering students should also take ENGR 400. Students majoring in Business Administration with an MIS concentration should take CISP 370. SCC transfer students to the University of California, Davis who are majoring in Computer Science should take CISP 440.

**Suggested Electives**

BUS 100, 300, 330; ENGR 300, ESLW 340, MATH 400, 401, 420; MGMT 306, PHIL 310, PHYS 410, 420; STAT 300

**Associate in Science (A.S.) Degree**

The Associate in Science Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

**Management Information Science****Associate in Science Degree****Certificate of Achievement****Program Information**

The Management Information Science degree is designed for students preparing for careers in business to effectively use and manage computers. The focus of the program is to develop student proficiency in a variety of computer applications and operating systems so that they may produce timely and accurate information. Elective courses give an opportunity to develop further skills in computer programming, database management, networking, Web development, and information systems security. This program will enhance students' skills so that they may transfer to a four-year university or qualify for entry-level positions in a variety of careers.

**Career Opportunities**

Computer skills and experience are needed for technical support staff, end-user consultants, network administrators, database specialists, information systems managers/specialists, programmers/analysts, software specialists, systems analysts, technical writers, information systems security specialists and webmasters. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow 22.9% annually and will continue to exceed the number of available and trained workers.

**Note to Transfer Students**

If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a SCC counselor to select and plan courses for your major. Schools vary widely in terms of the required preparation.

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

- solve business problems by utilizing various types of microcomputer application software.
- design algorithms that can be implemented by writing computer programs to solve typical business problems.
- construct and implement computer programs by applying the steps of the program development model working individually or in a team.
- design professional documents for a variety of situations using appropriate productivity software, working individually or in a team.
- demonstrate working knowledge of principles in computer networking, data management, information systems security, web development, or more indepth programming depending on the electives chosen.
- adapt to technological changes and innovations in the computer industry and use techniques, skills, and tools necessary to meet needs.
- locate information stored on the Internet, determine the validity of online resources, download and store files, and use the correct syntax for citing Internet resources

**Required Program****Units**

CISA 305 Beginning Word Processing .....	2
CISA 310 Introduction to Electronic Spreadsheets .....	1
CISA 323 Database Management using Microsoft Access .....	2
CISA 340 Presentation Graphics.....	2
CISC 320 Operating Systems (1) .....	1
or CISC 323 Linux Operating System (1)	
CISC 305 Introduction to the Internet .....	1
CISC 310 Introduction to Computer Information Science.....	3
CISP 301 Algorithm Design and Implementation.....	4
CISP 360 Introduction to Structured Programming (4) .....	4
or CISP 320 COBOL Programming (4)	
or CISP 370 Beginning Visual Basic (4)	

A minimum of 4 units from the following:..... 4

CISP 320 COBOL Programming (4)	
CISP 370 Beginning Visual Basic (4)	
CISP 400 Object Oriented Programming with C++ (4)	
CISP 401 Object Oriented Programming with Java (4)	

A minimum of 4 units from the following:..... 4

CISA 306 Intermediate Word Processing (2)	
CISA 311 Intermediate Electronic Spreadsheets (1)	
CISA 324 Database Management using SQL (2)	
CISC 110 Using ePortfolios (1)	
CISC 321 Intermediate Operating Systems (1)	
CISC 324 Intermediate Linux Operating System (1)	
CISC 355 Introduction to Data Communications (1.5)	
CISC 360 Microcomputer Support and Maintenance (4)	

A minimum of 6 units from the following:.....	6
CISC 306 Introduction to Web Page Creation (1)	
CISC 355 Introduction to Data Communications (1.5)	
CISN 300 Network Systems Administration (3)	
CISN 303 Network Administration - Linux Server (3)	
CISN 306 Advanced Network Systems Administration (3)	
CISN 308 Internetworking with TCP/IP (3)	
CISP 310 Assembly Language Programming for Microcomputers (4)	
CISP 320 COBOL Programming (4)	
CISP 350 Database Programming (3)	
CISP 370 Beginning Visual Basic (4)	
CISP 400 Object Oriented Programming with C++ (4)	
CISP 401 Object Oriented Programming with Java (4)	
CISP 430 Data Structures (4)	
CISP 440 Discrete Structures for Computer Science (3)	
CISP 452 Introduction to Systems Programming (3)	
CISP 457 Computer Systems Analysis and Project Management (3)	
CISS 300 Introduction to Information Systems Security (1)	
CISS 301 Ethical Hacking (2)	
CISS 310 Network Security Fundamentals (3)	
CISW 321 Web Site Development using Dreamweaver (3)	
CISW 320 Introduction to Web Site Development (3)	
CISW 325 Intermediate Web Site Development (4)	
CISW 400 Client-side Web Scripting (4)	
CISW 410 Middleware Web Scripting (4)	
CISW 420 Server-side Web Scripting (4)	

**Total Units Required** **34**

#### Other Electives

ACCT 301, 311; BUS 310, ECON 302, 304; ENGWR 300 or 480;  
MATH 120, 400, 401; MGMT 306; STAT 300 or 480

#### Associate in Science (A.S.) Degree

The Associate in Science Degree in Management Information Science may be obtained by completion of the required program, plus sufficient general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

#### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Programming

### Certificate of Achievement

#### Program Information

The programming certificate provides the basic proficiencies required of computer programmers for entry-level software technician positions or further study in Computer Science.

#### Career Opportunities

Although programmer and programmer-analyst opportunities will decrease by approximately 3% by 2018, other programming-related positions will increase. According to the Bureau of Labor Statistics (2008-2018) figures, demand for software designers, systems analysts, database administrators and software testers will grow 34% annually and will continue to exceed the number of available and trained workers.

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

- analyze information processing requirements using Structured or object oriented software development methodologies.
- design structured or object oriented software systems.
- build structured or object oriented software systems.
- evaluate software systems for conformance to system requirements.
- serve as a member of a software development team.

### Required Program

### Unit

BUS 310 Business Communications (3).....	3
or ENGWR 300 College Composition (3)	
or ENGWR 480 Honors College Composition (3)	
or ENGWR 101 College Writing (3)	
CISP 301 Algorithm Design and Implementation.....	4
CISP 360 Introduction to Structured Programming .....	4
CISP 400 Object Oriented Programming with C++ (4).....	4
or CISP 401 Object Oriented Programming with Java (4)	
CISP 430 Data Structures.....	4
CISP 457 Computer Systems Analysis and Project Management.....	3

**Total Units Required** **22**

#### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Information Processing

### Associate in Science Degree

#### 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, and information processing specialists. Based on Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow approximately 11.0% and will continue to exceed the number of available and trained workers.

#### Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

Course work to obtain the Word Processing Technician Certificate, the Information Processing Technician Certificate, and the Information Processing Specialist Certificate is required.

**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.
- explain how the individual, society, and human heritage impacts 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 fields 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

**Required Program****Units**

CISC 300 Computer Familiarization (1).....	1 - 3
or CISC 310 Introduction to Computer Information Science (3)	
CISA 305 Beginning Word Processing .....	2 <sup>1</sup>
CISA 305 Beginning Word Processing .....	2 <sup>2</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>3</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>4</sup>
CISC 110 Using ePortfolios.....	1
CISA 340 Presentation Graphics.....	2
CISC 305 Introduction to the Internet .....	1
CISA 310 Introduction to Electronic Spreadsheets .....	1
CISC 320 Operating Systems.....	1 <sup>5</sup>
CISA 311 Intermediate Electronic Spreadsheets .....	1
CISA 323 Database Management using Microsoft Access .....	2
ET 145 Basic Computer System Repair I (1).....	4 - 7
and ET 146 Basic Computer System Repair II (3)	
and ET 147 Basic Computer System Repair III (3)	
or CISC 360 Microcomputer Support and Maintenance (4)	

A minimum of 2 units from the following:..... 2  
 CISC 498 Work Experience in Computer Information Science - Core (1 - 4)

**Total Units Required****24 - 29**<sup>1</sup> MS-WORD<sup>2</sup> COREL WordPerfect - Windows or LINUX<sup>3</sup> MS-WORD<sup>4</sup> COREL WordPerfect - Windows or LINUX<sup>5</sup> Windows or UNIX/LINUX**Suggested Electives**

CISC 306, 324, 351; CISS 300, ET 490

**Associate in Science (A.S.) Degree**

The Associate in Science Degree in Information Processing may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

**Information Processing Specialist****Certificate of Achievement****Program Information**

This certificate builds upon a previous background in the use of microcomputer application programs. As the student advances in an office-related career path, technical expertise in all aspects of information processing is expected. In addition to advanced software courses in spreadsheet and database management, this certificate also provides the student with hands-on training in hardware support and maintenance.

**Career Opportunities**

Many students who are currently employed in mid-level office positions are interested in opportunities for advancement to lead or resource person. These positions require a high proficiency with office software applications as well as the ability to identify and troubleshoot micro-computer problems.

Such positions include: first line supervisors, administrative analysts, information resource personnel, or lead administrative specialists. Based on Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow approximately 11.0% annually and will continue to exceed the number of available and trained workers.

**Enrollment Eligibility**

To be eligible for enrollment in the program, the student must meet the following criteria:

Course work to obtain the Word Processing Technician Certificate and the Information Processing Technician Certificate is required.

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

- design, implement, manage, and evaluate data management systems involving custom programming to solve complex business problems.
- analyze and integrate data from various application programs for individual and group on-the-job projects.
- set up, test, and implement complex macros and programming for on-the-job usage.
- demonstrate understanding of basic hardware components and the organization, installation, and repair of microcomputers.
- evaluate different hardware and software specification standards and implement problem-solving strategies or techniques using various diagnostic tools.
- analyze on-the-job needs, identify software and hardware related problems, and effectively communicate solutions to end users.

**Required Program****Units**

CISC 300 Computer Familiarization (1).....	1 - 3
or CISC 310 Introduction to Computer Information Science (3)	
CISA 305 Beginning Word Processing .....	2 <sup>1</sup>
CISA 305 Beginning Word Processing .....	2 <sup>2</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>3</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>4</sup>
CISC 110 Using ePortfolios.....	1
CISA 340 Presentation Graphics.....	2
CISC 305 Introduction to the Internet .....	1
CISA 310 Introduction to Electronic Spreadsheets .....	1
CISA 323 Database Management using Microsoft Access .....	2
CISC 320 Operating Systems.....	1 <sup>5</sup>
CISA 311 Intermediate Electronic Spreadsheets .....	1
ET 145 Basic Computer System Repair I (1).....	4 - 7
and ET 146 Basic Computer System Repair II (3)	
and ET 147 Basic Computer System Repair III (3)	
or CISC 360 Microcomputer Support and Maintenance (4)	

A minimum of 2 units from the following:..... 2  
 CISC 498 Work Experience in Computer Information  
 Science - Core (1 - 4)

**Total Units Required** **24 - 29**

<sup>1</sup> MS-WORD

<sup>2</sup> COREL WordPerfect - Windows or LINUX

<sup>3</sup> MS-WORD

<sup>4</sup> COREL WordPerfect - Windows or LINUX

<sup>5</sup> Windows or UNIX/LINUX

#### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Information Processing Technician

### Certificate of Achievement

#### 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 require 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 (2008-2018) figures, job demands in these areas will grow an average of 11.4% annually and will continue to exceed the number of available and trained workers.

#### Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

Course work to obtain the Word Processing Technician Certificate is required.

#### 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.

#### Required Program

#### Units

CISC 300 Computer Familiarization (1).....	1 - 3
or CISC 310 Introduction to Computer Information Science (3)	
CISA 305 Beginning Word Processing .....	2 <sup>1</sup>
CISA 305 Beginning Word Processing .....	2 <sup>2</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>3</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>4</sup>
CISC 110 Using ePortfolios.....	1
CISA 340 Presentation Graphics.....	2
CISC 305 Introduction to the Internet .....	1
CISA 310 Introduction to Electronic Spreadsheets .....	1
CISC 320 Operating Systems.....	1 <sup>5</sup>
CISA 323 Database Management using Microsoft Access .....	2

A minimum of 2 units from the following:..... 2  
 CISC 498 Work Experience in Computer Information  
 Science - Core (1 - 4)

**Total Units Required** **19 - 21**

<sup>1</sup> MS-WORD

<sup>2</sup> COREL WordPerfect - Windows or LINUX

<sup>3</sup> MS-WORD

<sup>4</sup> COREL WordPerfect - Windows or LINUX

<sup>5</sup> Windows or UNIX/LINUX

#### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Word Processing Technician

### Certificate of Achievement

#### Program Information

This word processing certificate introduces students to microcomputer concepts and skills in the two most widely used word processing software packages currently used in the United States. This certificate allows students to bring basic computer knowledge and word processing skills to entry level positions. It provides students with electronic documentation of all past and current educational and professional accomplishments and experiences to fit individual job requirements in business companies, private non-profit organizations, government agencies, and legal firms. It also enables students to have direct work experience utilizing word processing software skills.

#### Career Opportunities

Word processing skills are in high demand by nearly every organization, company, or agency. Entry-level clerical, secretarial, and receptionist positions traditionally use software packages designed for word processing of memos and correspondence, reports, and manuals.

With the increased demand for and integration of technology in the work place, the demand for employees competent in manipulating text has evolved to other computer-related office positions. Particularly in the current job market, basic text processing skills are essential. Such positions include: office assistants and clerks, information and records clerks, and correspondence clerks. Based on recent Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow an average of 14.4% annually and will continue to exceed the number of available and trained workers.

Additionally, areas such as web site design, accounting or bookkeeping, banking, and supervisory/managerial positions require some skills in text processing as integral parts of the job.

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

- demonstrate competency in basic Windows operating system terminology and commands, file management and storage, and data input.
- demonstrate competency in two state-of-the-art word processing software systems.
- recognize and identify word processing terminology, styles, libraries, and settings.
- describe and analyze word processing concepts and theories to interpret and operate appropriate applications.
- explain and use all formatting components within presentation quality documents (including all format commands and codes, tables, different tab and indent settings).
- design and complete presentation quality business materials without the use of the help feature or templates.
- analyze and apply appropriate word processing features (e.g., line and page numbering, headers/footers) to complete typical business reports and documents.
- organize and complete a multi-page business document incorporating advanced document features (e.g., graphics, outlining, macro, and merge).

<b>Required Program</b>	<b>Units</b>
CISC 300 Computer Familiarization (1) ..... or CISC 310 Introduction to Computer Information Science (3)	1 - 3
CISA 305 Beginning Word Processing .....	2 <sup>1</sup>
CISA 305 Beginning Word Processing .....	2 <sup>2</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>3</sup>
CISA 306 Intermediate Word Processing .....	2 <sup>4</sup>
CISC 110 Using ePortfolios.....	1
A minimum of 2 units from the following:.....	2
CISC 498 Work Experience in Computer Information Science - Core (1 - 4)	

**Total Units Required** **12 - 14**

<sup>1</sup> MS-WORD  
<sup>2</sup> COREL WordPerfect - Windows or LINUX  
<sup>3</sup> MS-WORD  
<sup>4</sup> COREL WordPerfect - Windows or LINUX

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better.

**Information Systems Security**

**Associate in Science Degree**

**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.

**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.

**Career Opportunities**

Networking/security skills and experience are needed for technical support staff, administrators, designers, troubleshooters, and information systems security specialists. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow a phenomenal 37.1% annually, and will continue to exceed the number of available and trained workers.

<b>Required Program</b>	<b>Units</b>
CISC 320 Operating Systems (1) ..... or CISC 323 Linux Operating System (1)	1
CISN 300 Network Systems Administration (3) ..... or CISN 303 Network Administration - Linux Server (3)	3
CISN 302 Intermediate Network Systems Administration (3) .....	3
CISS 300 Introduction to Information Systems Security .....	1
CISS 310 Network Security Fundamentals.....	3
CISS 320 Implementing Network Security and Counter Measures .....	3
CISS 330 Implementing Internet Security and Firewalls .....	3
CISS 341 Implementing Windows Operating System Security (3) ..... or CISS 342 Implementing Linux Operating System Security (3)	3
CISS 350 Disaster Recovery .....	3
CISS 360 Computer Forensics and Investigation .....	3

A minimum of 3 units from the following: .....

CISC 310 Introduction to Computer Information Science (3)	3
CISC 355 Introduction to Data Communications (1.5)	1.5
CISC 351 Introduction to Local Area Networks (1)	1
CISC 360 Microcomputer Support and Maintenance (4)	4
CISN 308 Internetworking with TCP/IP (3)	3
CISN 374 Messaging Server Administration (3)	3
CISN 340 CISCO Networking Academy (CCNA) <sup>™</sup> : Data Communication and Networking (3)	3
CISC 324 Intermediate Linux Operating System (1)	1
CISS 301 Ethical Hacking (2)	2
CISN 315 Advanced Network Administration (2)	2
CISN 303 Network Administration - Linux Server (3)	3
CISN 341 CISCO Networking Academy (CCNA) <sup>™</sup> : Networking Theory and Routing Technologies (3)	3

**Total Units Required** **29**

**Suggested Electives**

BUS 310, ENGWR 300 or 480, ESLW 340

**Associate in Science (A.S.) Degree**

The Associate in Science degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

## Information Systems Security

### Certificate of Achievement

#### 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

Networking/security skills and experience are needed for technical support staff, administrators, designers, troubleshooters, and information systems security specialists. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow a phenomenal 37.1% annually, and will continue to exceed the number of available and trained workers.

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

- define best practices for configuring network operating system services to provide optimum security.
- 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.
- compare and contrast the benefits of firewalls vs. intrusion detection devices and software.
- construct file system permissions and share permissions to allow only the minimum levels of access needed by users to use network resources.

#### Required Program

#### Units

CISC 320 Operating Systems (1) ..... 1 or CISC 323 Linux Operating System (1)	1
CISN 300 Network Systems Administration (3) ..... 3 or CISN 303 Network Administration - Linux Server (3) or CISN 304 Networking Technologies (3)	3
CISS 310 Network Security Fundamentals..... 3	3
CISS 320 Implementing Network Security and..... 3 Counter Measures	3
CISS 330 Implementing Internet Security and Firewalls ..... 3	3
CISS 341 Implementing Windows Operating System ..... 3 Security (3) or CISS 342 Implementing Linux Operating System Security (3)	3
A minimum of 6 units from the following: ..... 6	6
CISS 300 Introduction to Information Systems Security (1)	
CISS 301 Ethical Hacking (2)	
CISS 341 CISCO Networking Academy (CCNA) <sup>tm</sup> : Networking Theory and Routing Technologies (3)	
CISS 350 Disaster Recovery (3)	
CISS 360 Computer Forensics and Investigation (3)	

#### Total Units Required

22

#### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Network Administration

### Associate in Science Degree

### Certificate of Achievement

#### Program Information

The Network Administration Degree and Certificate of Achievement provides the 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 Administration Degree and Certificate of Achievement prepare students for entry-level positions in computer network administration.

#### Career Opportunities

Networking skills and experience are needed for network technical support staff, network administrators, network designers, network troubleshooters, and information systems security specialists. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow a phenomenal 53.4% annually and will continue to exceed the number of available and trained workers

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

- demonstrate competency in Windows operating system terminology and commands, account management, and file management and storage.
- construct and implement computer network systems by applying the steps of the network design model working individually or in a team.
- demonstrate working knowledge of principles in computer networking and data management, or information systems security, or web server administration, depending on the electives chosen.
- define best practices for configuring network operating system services.
- analyze and apply directory services group policy settings at the Organizational Unit (OU), domain, site or local machine level.

#### Required Program

#### Units

CISC 320 Operating Systems (1) ..... 1 or CISC 323 Linux Operating System (1)	1
CISN 300 Network Systems Administration (3) ..... 3	3
CISN 302 Intermediate Network Systems Administration ..... 3	3
CISN 306 Advanced Network Systems Administration (3) ..... 3	3
CISN 307 Windows Active Directory Services..... 3	3
CISN 308 Internetworking with TCP/IP ..... 3	3
CISS 300 Introduction to Information Systems Security (1)..... 1 - 2 or CISS 301 Ethical Hacking (2)	1 - 2
A minimum of 10 units from the following: ..... 10	10
CISS 310 Introduction to Computer Information Science (3)	
CISS 324 Intermediate Linux Operating System (1)	
CISS 351 Introduction to Local Area Networks (1)	
CISS 355 Introduction to Data Communications (1.5)	
CISN 340 CISCO Networking Academy (CCNA) <sup>tm</sup> : Data Communication and Networking (3)	
CISN 341 CISCO Networking Academy (CCNA) <sup>tm</sup> : Networking Theory and Routing Technologies (3)	
CISN 346 Network Design and Projects (3.5)	
CISN 303 Network Administration - Linux Server (3)	
CISN 304 Networking Technologies (3)	
CISN 315 Advanced Network Administration (2)	
CISN 320 Designing Windows Directory Services (3)	
CISN 374 Messaging Server Administration (3)	
CISS 301 Ethical Hacking (2)	
CISS 310 Network Security Fundamentals (3)	
CISS 320 Implementing Network Security and Counter Measures (3)	
CISS 330 Implementing Internet Security and Firewalls (3)	
CISS 360 Computer Forensics and Investigation (3)	
CISS 350 Disaster Recovery (3)	

#### Total Units Required

27 - 28

**Suggested Electives**

BUS 310, ENGWR 300 or 480, ESLW 340, STAT 480

**Associate in Science (A.S.) Degree**

The Associate in Science Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

**Network Design****Associate in Science Degree****Certificate of Achievement****Program Information**

The Network Design Degree and Certificate of Achievement provides the 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**

Networking skills and experience are needed for network technical support staff, network administrators, network designers, network troubleshooters, and information systems security specialists. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow a phenomenal 53.4% annually and will continue to exceed the number of available and trained workers.

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

- develop best practices for configuring Internet Protocol (IP) addresses.
- evaluate and implement technologies to support IP routing protocols such as Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP), and Open Shortcut Path First (OSPF).
- construct and configure access lists.
- compare and contrast types of network media.
- demonstrate working knowledge of principles in computer networking and data management, 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

**Required Program****Units**

CISC 320 Operating Systems (1) .....	1
or CISC 323 Linux Operating System (1)	
CISN 340 CISCO Networking Academy (CCNA) <sup>™</sup> : .....	3
Data Communication and Networking Fundamentals	
CISN 341 CISCO Networking Academy (CCNA) <sup>™</sup> : .....	3
Networking Theory and Routing Technologies	
CISN 342 CISCO Networking Academy (CCNA) <sup>™</sup> : .....	3
Advanced Routing and Switching	
CISN 343 CISCO Networking Academy (CCNA) <sup>™</sup> : .....	3
Wide Area Network and Project-Based	
CISN 346 Network Design and Projects.....	3.5
CISN 336 Wireless Technologies.....	3
CISN 308 Internetworking with TCP/IP .....	3
CISS 310 Network Security Fundamentals.....	3
A minimum of 6 units from the following:.....	6
CISC 310 Introduction to Computer Information Science (3)	
CISN 300 Network Systems Administration (3)	
CISN 303 Network Administration - Linux Server (3)	
CISN 304 Networking Technologies (3)	
CISN 320 Implementing Network Security and Counter Measures (3)	

**Total Units Required****31.5****Associate in Science (A.S.) Degree**

The Associate in Science Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

**Advanced CISCO Networking****Certificate of Achievement****Program Information**

The Advanced CISCO Networking Certificate recognizes the advanced skills needed for job enhancement and promotion in today's networking and Internet environment. It focuses on advanced knowledge and skills required for supervisory, management, and troubleshooting computer network operations. It prepares students for promotional positions in computer network design.

**Career Opportunities**

Networking skills and experience are needed for network technical support staff, network administrators, network designers, network troubleshooters, and information systems security specialists. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow a phenomenal 53.4% annually and will continue to exceed the number of available and trained workers.

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

- develop best practices for configuring scalable IP addresses.
- construct and configure complex access control lists.
- design and test edge router connectivity into a BGP network.
- evaluate and implement advanced multilayer switching configuration.

Required Program	Units
CISN 350 CISCO Networking Academy (CCNP) <sup>™</sup> : ..... 3 Advanced Router Configuration	
CISN 351 CISCO Networking Academy (CCNP) <sup>™</sup> : ..... 3 Remote Access (3) or CISN 336 Wireless Technologies (3)	
CISN 352 CISCO Networking Academy (CCNP) <sup>™</sup> : ..... 3 Multi-Layer Switching	
CISN 353 CISCO Networking Academy (CCNP) <sup>™</sup> : ..... 3 Internetwork Troubleshooting	
CISN 342 CISCO Networking Academy (CCNA) <sup>™</sup> : ..... 3 Advanced Routing and Switching	
CISN 343 CISCO Networking Academy (CCNA) <sup>™</sup> : ..... 3 Wide Area Network and Project-Based	
<b>Total Units Required</b>	<b>18</b>

### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required courses with grades of "C" or better.

## PC Support

### Certificate of Achievement

#### Program Information

With the rapid expansion of computers into all aspects of society, there is a growing need for technicians with a broad range of knowledge in computer applications to install, maintain, and support computers and the networks that they utilize. Students earning this certificate are prepared to acquire entry-level positions in computer support. Employers hiring students earning this certificate will immediately benefit from the skills the students bring to their jobs.

#### Career Opportunities

Career opportunities for students earning the PC Support Certificate include entry level positions in the following areas: Technical Salesperson, Help Desk Support Technician, Systems Analyst, Data Entry Personnel, Assistant Documentation Specialist and Assistant Trainer. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow 22.9% annually and will continue to exceed the number of available and trained workers.

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

- compose clear, grammatically-correct documents related to business.
- design electronic spreadsheets useful in making decisions.
- design, install, and maintain a local area network.
- design presentation graphics.
- construct and implement web pages, including links, graphics, and text.
- demonstrate understanding of the basic components of data communications.
- analyze and troubleshoot computer hardware and software problems.
- apply database software to organize information for decision-making.
- demonstrate competency in basic operating systems terminology, commands, and functions.
- demonstrate competence in the Internet related to searches, email, and security.
- demonstrate competence in formatting text using word processing software.

Required Program	Units
BUS 310 Business Communications (3)..... 3 - 4 or ENGWR 300 College Composition (3) or ENGWR 480 Honors College Composition (3) or ESLW 340 Advanced Composition (4)	
CISC 310 Introduction to Computer Information Science..... 3	
CISC 320 Operating Systems..... 1	
CISA 305 Beginning Word Processing ..... 2	
CISA 310 Introduction to Electronic Spreadsheets ..... 1	
CISA 323 Database Management using Microsoft Access..... 2	
CISC 355 Introduction to Data Communications ..... 1.5	
CISC 351 Introduction to Local Area Networks..... 1	
CISC 305 Introduction to the Internet ..... 1	
CISA 340 Presentation Graphics..... 2	
CISC 306 Introduction to Web Page Creation (1)..... 1-3 or CISW 320 Introduction to Web Site Development (3)	
CISS 300 Introduction to Information Systems Security (1)..... 1 - 2 or CISS 301 Ethical Hacking (2)	
CISC 360 Microcomputer Support and Maintenance (4)..... 4 or [ET 145 Basic Computer System Repair I (1) and ET 146 Basic Computer System Repair II (3)]	
<b>Total Units Required</b>	<b>23.5 - 27.5</b>

### Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

## Web Developer

### Associate in Science Degree

#### Certificate of Achievement

#### Program Information

Web Developers are proficient at creating Web site structure and interactivity. The Web Developer degree requires students to use database tools and custom applications to design, code, and test interactive Web sites. There is emphasis on learning the programming and scripting languages that connect a database to a Web site.

#### Career Opportunities

This Web Developer Degree prepares students to become Web Developer, Webmaster, Systems Analyst, Web Systems Analyst, IT Analyst, ICT Analyst, Web Database Administrator, Back-end Developer, Web Programmer.

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

- manage a multi-level Web site hosted on a Web server.
- utilize multiple programs simultaneously in order to develop Web sites.
- recommend a Web scripting language, current markup language or Web authoring software, and cascading style sheets to develop complex Web sites that are uploaded via File Transfer Protocol (FTP) to a Web server.
- research and implement current, valid World Wide Web Consortium (W3C) standards including technical recommendations for markup languages, the Web Accessibility Initiative (WAI), the Web Mobility Initiative (WMI), and other recommendations as they are introduced.
- plan a structured approach to Web site development that identifies the information dissemination needs of a client and organizes the content effectively and efficiently in order to communicate to an identified audience; then develop and implement an appropriate Web solution.
- utilize client-side scripting in order to manipulate interactive objects like navigation bars, forms, rollovers, other event handling, and the control of windows, frames, and layers.
- develop Web solutions that include form validation and processing, server-side programming with hypertext-preprocessor (PHP), active server pages (ASP), CGI scripting with Perl, and

- database-driven Web development.
- demonstrate proficiency in the process of Web project management on a real-world Web site including design specification, research, production, modification, time estimation, and presentation.
- design, implement, manage, and evaluate data management systems involving custom programming to solve complex business problems.
- estimate the hours needed or cost to develop and deliver the solution to a complex business problem.
- write code in a currently used Web scripting language.

<b>Required Program</b>	<b>Units</b>
CISW 320 Introduction to Web Site Development.....	3 <sup>1</sup>
CISC 323 Linux Operating System (1).....	1
CISC 324 Intermediate Linux Operating System.....	1
CISA 324 Database Management using SQL.....	2 <sup>2</sup>
CISP 401 Object Oriented Programming with Java.....	4 <sup>3</sup>
CISP 350 Database Programming.....	3 <sup>4</sup>
CISW 325 Intermediate Web Site Development.....	4 <sup>5</sup>
CISW 350 Imaging for the Web (1).....	1 - 3
or GCOM 330 Digital Imaging 1 (3)	
CISW 370 Designing Accessible Web Sites.....	1
CISW 400 Client-side Web Scripting.....	4
CISW 304 Cascading Style Sheets (2).....	2
or CISW 440 XML: Introduction to Extensible Markup Language (2)	
CISW 410 Middleware Web Scripting (4).....	4
or CISW 420 Server-side Web Scripting (4)	
CISW 470 Web Projects.....	3
<b>Total Units Required</b>	<b>33 - 35</b>

<sup>1</sup> CISW300 can be used to fulfill this requirement.  
<sup>2</sup> CISA 323 is a prerequisite for this course.  
<sup>3</sup> CISP 301 and CISP 360 are prerequisites for this course.  
<sup>4</sup> taken at SCC  
<sup>5</sup> CISW 310 can be used to fulfill this requirement.

**Suggested Electives**  
 BUS 210, 212, 218; CISP 301, 360, 457; PHIL 310

**Associate in Science (A.S.) Degree**  
 The Associate in Science degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total.

**Certificate of Achievement**  
 The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better.

**Active Server Pages Developer  
 Certificate of Achievement**

**Program Information**  
 This certificate is designed to prepare students to develop, design, manage, and create Websites using Active Server Pages (ASP).

**Career Opportunities**  
 Web design/web skills and experience are needed for webmaster/web administrator jobs as well as many IT specialists and support positions. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow at 13.0% annually and will continue to exceed the number of available and trained workers.

- Upon completion of this program, the student will be able to:**
- apply file management techniques to the management of multi-level Web sites hosted on a Web server.
  - utilize multiple programs simultaneously in order to develop Web sites.
  - utilize markup languages, including XHTML, web authoring software, and cascading style sheets to develop multi-level Web sites that are uploaded via File Transfer Protocol (FTP) to a Web server.
  - plan a structured approach to Web site development that identifies the information dissemination needs of a client and organizes the content effectively and efficiently in order to communicate to an identified audience; then develop and implement an appropriate Web solution.
  - demonstrate basic skills in form validation and processing, server-side programming with Active Server Pages (ASP) and database-driven Web development.
  - demonstrate proficiency in the process of Web project management on a real-world Web site including design specification, research, production, modification, and presentation.
  - design, implement, manage, and evaluate data management systems involving custom programming to solve complex business problems.

<b>Required Program</b>	<b>Units</b>
CISW 320 Introduction to Web Site Development.....	3
CISW 325 Intermediate Web Site Development.....	4
CISW 370 Designing Accessible Web Sites.....	1
CISW 410 Middleware Web Scripting.....	4
CISW 411 Middleware Scripting Database Web Applications.....	2
CISW 470 Web Projects.....	3
<b>Total Units Required</b>	<b>17</b>

**Certificate of Achievement**  
 The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better.

**Webmaster, Level 1  
 Certificate of Achievement**

**Program Information**  
 Webmasters are proficient at blending the art of Web page coding with the visual arts to create pages that are content rich and visually pleasing. They are skilled with page layout, image creation and manipulation, and Web page scripting. In addition, they administer the Web sites and keep them secure. The Webmaster, Level 1 certificate requires learning to use current markup languages and industry standard software for Web content development and presentation, following the international standards as recommended by the World Wide Web Consortium. This certificate prepares the student for employment as a member of a Web professional team.

**Career Opportunities**  
 This certificate prepares student to become a Webmaster, Web Team Member, Information System Analyst, Information Technology Analyst, or Web Designer.

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

- apply file management techniques to the management of multi-level Web sites hosted on a Web server.
- utilize multiple programs simultaneously in order to develop Web sites.
- explain the global infrastructure that supports the Internet and the World Wide Web and how communication through the Web is accomplished.
- demonstrate an understanding of the visual design concepts related to designing a Web site for a specific audience using a storyboard and wire frames.
- create optimized graphic and media elements that effectively enhance a Web site without impacting bandwidth.
- utilize markup languages, including XHTML, web authoring software, and cascading style sheets (CSS) to develop multi-level Web sites that are uploaded via File Transfer Protocol (FTP) to a Web server.
- research and implement current World Wide Web Consortium (W3C) standards including technical recommendations for markup languages, the Web Accessibility Initiative (WAI), the Web Mobility Initiative (WMI), and other recommendations as they are introduced.
- plan a structured approach to Web site development that identifies the information dissemination needs of a client and organizes the content effectively and efficiently in order to communicate to an identified audience, and then develop and implement an appropriate Web solution.
- utilize client-side scripting and Cascading Style Sheets in order to manipulate interactive objects like navigation bars, forms, rollovers, other event handling, and the control of windows, frames, and layers.
- demonstrate basic skills in form validation and processing, server-side programming with hypertext pre-processor (PHP), CGI scripting with Perl, and database-driven Web development.
- demonstrate proficiency in the process of Web project management on a real-world Web site including design specification, research, production, modification, and presentation.
- explain the history of electronic commerce including the theory and practice of marketing via the World Wide Web.
- demonstrate proficiency in Web business principles including organic and paid search marketing and optimization, Web marketing, business processes, contract negotiations, change orders and general business planning.
- understand fundamental legal issues as they relate to Web development copyright and privacy policies.
- develop an awareness of Web security issues.

**Required Program****Units**

CISC 305 Introduction to the Internet (1) .....	1-3
or CISC 310 Introduction to Computer Information Science (3)	
or CISC 355 Introduction to Data Communications (1.5)	
CISC 320 Operating Systems (1) .....	1 - 1.5
or CISC 323 Linux Operating System (1)	
or GCOM 101 Introduction to the Macintosh (1.5)	
MKT 330 Internet Marketing .....	3
CISW 320 Introduction to Web Site Development.....	3 <sup>1</sup>
CISW 350 Imaging for the Web (1) .....	1 - 3
or GCOM 330 Digital Imaging (3)	
GCOM 360 Introduction to Web and Interactive Technologies .....	3
CISW 370 Designing Accessible Web Sites .....	1
CISW 304 Cascading Style Sheets .....	2
CISW 321 Web Site Development using Dreamweaver .....	3
CISW 325 Intermediate Web Site Development (4) .....	4 <sup>2</sup>
or CISW 400 Client-side Web Scripting (4)	
CISW 470 Web Projects .....	3
<b>Total Units Required</b>	<b>25 - 29.5</b>

<sup>1</sup> CISW 300 can be used to fulfill this requirement.

<sup>2</sup> CISW 310 can be used to fulfill this requirement.

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

**Webmaster, Level 2****Certificate of Achievement****Program Information**

Webmasters are practitioners of communication via the World Wide Web who are proficient in the technical aspects of Web site design and development, as well as the implementation and administration of Web servers. The Webmaster, Level 2 certificate requires learning standards-based Web site development and basic skills related to servers, routers, security, network management, and systems maintenance. This certificate prepares the student for free-lance or entry-level employment as a Webmaster or Web server administrator.

**Career Opportunities**

This certificate prepares students to become Webmaster, Web Team Member, Information System Analyst, Information Technology Analyst, or Web server administrator.

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

- apply file management techniques to the management of multi-level Web sites hosted on a Web server.
- explain the global infrastructure that supports the Internet and the World Wide Web and how communication through the Web is accomplished.
- explain the history of electronic communication including the theory and practice of doing business via the World Wide Web.
- utilize markup languages, including XHTML, web authoring software, and cascading style sheets to develop complex Web sites that are uploaded via File Transfer Protocol (FTP) to a Web server.
- research and implement current World Wide Web Consortium (W3C) standards including technical recommendations for markup languages, the Web Accessibility Initiative (WAI), the Web Mobility Initiative (WMI), and other recommendations as they are introduced.
- plan a structured approach to Web site development that identifies the information dissemination needs of a client and organizes the content effectively and efficiently in order to communicate to an identified audience; then develop and implement an appropriate Web solution.
- demonstrate basic skills in form validation and processing, server-side programming with hypertext pre-processor (PHP), CGI scripting with Perl, and database-driven Web development.
- demonstrate proficiency in the process of Web project management on a real-world Web site including design specification, research, production, modification, and presentation.
- administer a server in a client/server network including managing network security with user and group accounts, creating directory structures and network shares, monitoring and troubleshooting network resources, and establishing policies and procedures for server operations.
- administer a Web server using appropriate protocols for the Internet and intranets including the installation, configuration, management and tuning of Web servers; WWW and FTP services; security features; on-line transaction processing; and Web site optimization.
- analyze risks to a Web server and implement a workable security policy that protects information assets from potential intrusion, damage or theft, including countermeasures to deploy to thwart potential attacks.
- install and maintain a firewall to prevent unauthorized access to a Web server, manage secure access to key services while maintaining your organization's security, and implement firewall-to-firewall Virtual Private Networks (VPNs).

**Required Program**

**Units**

CISC 320 Operating Systems (1).....	1 - 3
or GCOM 101 Introduction to the Macintosh (1.5)	
or CISC 310 Introduction to Computer Information Science (3)	
CISC 323 Linux Operating System.....	1
CISC 355 Introduction to Data Communications.....	1.5
CISW 320 Introduction to Web Site Development (3).....	3 <sup>1</sup>
or CISW 321 Web Site Development using Dreamweaver (3)	
CISW 325 Intermediate Web Site Development (4).....	4 <sup>2</sup>
or CISW 410 Middleware Web Scripting (4)	
or CISW 420 Server-side Web Scripting (4)	
CISN 300 Network Systems Administration (3).....	3
CISN 303 Network Administration - Linux Server.....	3
CISN 308 Internetworking with TCP/IP .....	3
CISS 310 Network Security Fundamentals.....	3
CISS 330 Implementing Internet Security and Firewalls.....	3

**Total Units Required**

**25.5 - 27.5**

<sup>1</sup> CISW 300 can be used to fulfill this requirement.

<sup>2</sup> CISW 310 can be used to fulfill this requirement.

**Certificate of Achievement**

The Certificate of Achievement may be obtained by completion of the required program with grades of "C" or better.

**International Computer Driving License Certificate**

**Program Information**

This certificate is designed for students in any field who want to pass all seven examinations that are part of the International Computer Driving License (ICDL). In these courses, students will learn the terminology used in the world of computers and the World Wide Web. Then students will learn how to create files using a word processor, a spreadsheet, a database, a digital presentation package, and a Web page creation tool. Students who complete these courses should be prepared to take all seven examinations from ICDL.

**Career Opportunities**

Computer skills and experience are needed for office and administrative assistants, information technicians, insurance agents, retail clerks, and office clerks. According to the Bureau of Labor Statistics (2008-2018) figures, job demands in these areas will grow 11.0% annually 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 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.
- create presentations with common presentation software.
- identify Internet laws, guidelines, security and privacy issues.
- explain and show how to use the World Wide Web for sending and receiving mail, searching for information, using on-line directories, and transferring files from/to the Web to/from the personal computer.
- create a word processing document, a spreadsheet that calculates values, a memo or report, a report from a database, and a Web page using the appropriate software tools.
- explain what the most common software tools are called and what use they have including listing the most common filename extensions.

**Required Program**

**Units**

CISC 310 Introduction to Computer Information Science.....	3
CISA 305 Beginning Word Processing .....	2
CISA 310 Introduction to Electronic Spreadsheets .....	1
CISA 340 Presentation Graphics.....	2
CISC 305 Introduction to the Internet .....	1
CISA 323 Database Management using .....	2
Microsoft Access	

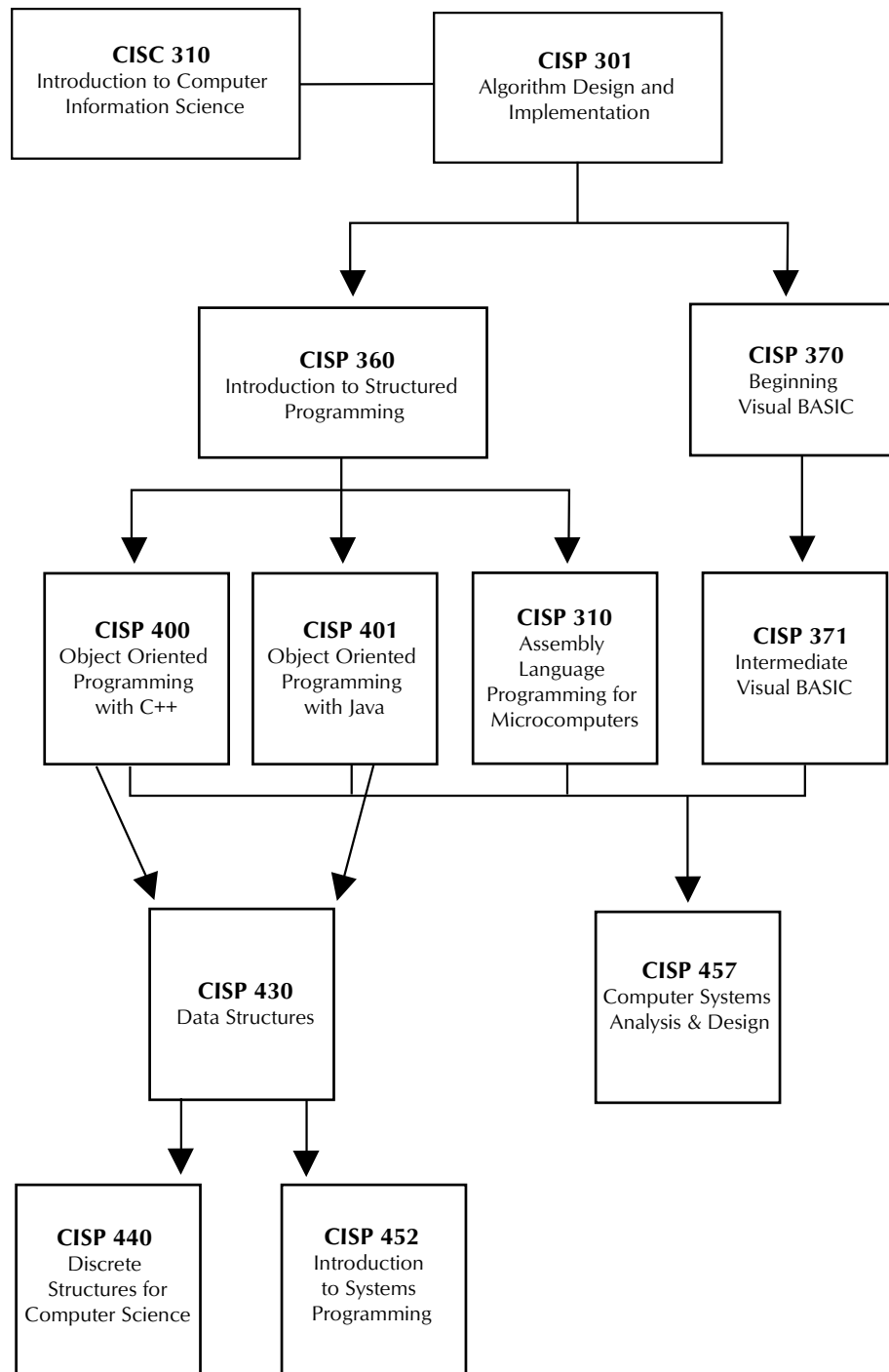
**Total Units Required**

**11**

**Certificate**

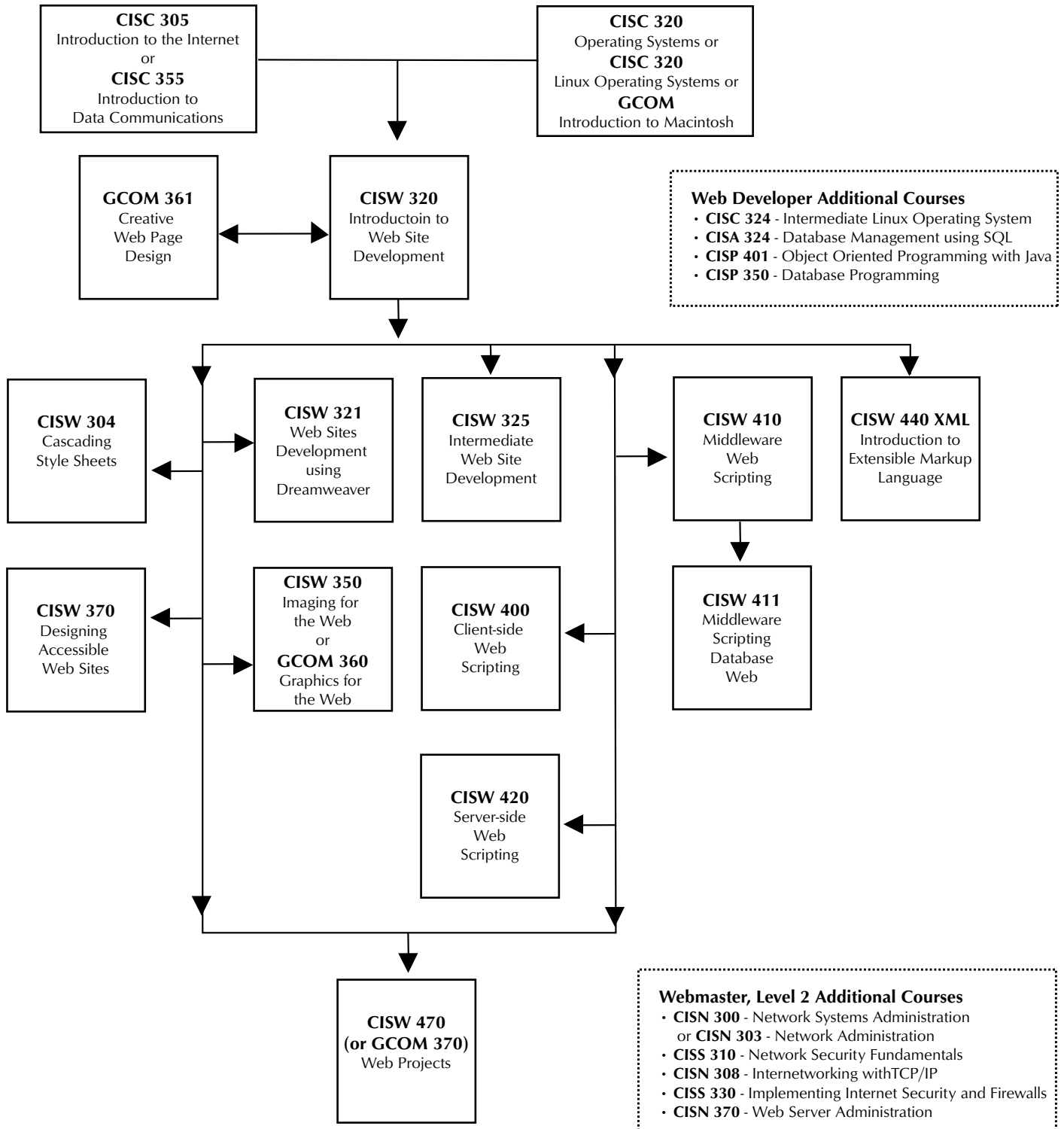
The Certificate may be obtained by completion of the required courses with grades of "C" or better.

## Computer Information Science Sequence of Modern Programming Language Courses



- CIS and MIS majors should enroll in both CISC 310 and CISP 301 at the same time.
- Transfer students should check with their counselor for degree requirements.

## Computer Information Science Sequence of Web Courses



Note: There is also another sequence of Web Design courses in Graphic Communication.  
All students should consult with a counselor to select the best courses to meet their academic goals.

## Computer Info Science - Applications (CISA)

### **CISA 305 Beginning Word Processing 2 Units**

*Prerequisite:* CISC 300 or 310 with a grade of "C" or better  
*Advisory:* BUSTEC 300.1 or BUSTEC 100.1 with a grade of "C" or better or keyboarding at 28 wpm.

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

The course introduces the student, through hands-on operation, to the use of word processing on microcomputers. The course includes basic word processing operations such as terminology and screen formats, dialog boxes, text editing, text formatting, text enhancements, sorting, tables, merging functions, saving and retrieving, and printing text. The course may be taken four times for credit on a different software package, version, or operating system -- provided no version or package is repeated.

### **CISA 306 Intermediate Word Processing 2 Units**

*Prerequisite:* CISA 305 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course builds upon previous training in the use of word processing programs. The course includes a brief review of basic editing and text concepts, and then covers intermediate software features such as document processing functions, macro programming functions, complex document styles and commands, and table and graphics applications. The course incorporates all word processing features into the production of one final presentation/job portfolio. The course may be taken four times for credit on a different software package, version, or operating system -- provided no version or package is repeated.

### **CISA 308 Exploring Word Processing and Presentation Software 1 Unit**

*Prerequisite:* None.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces word processing and presentation software. The basic features and skills of creating, editing, formatting, inserting tables and graphics into, and enhancing word documents and PowerPoint presentations are covered. This course meets the requirement for MIS 3 at CSUS. This course does not meet the requirements for SCC CIS certificates or degrees.

### **CISA 310 Introduction to Electronic Spreadsheets 1 Unit**

*Prerequisite:* None.

*Advisory:* BUSTEC 100.1 or BUSTEC 300.1 with a grade of "C" or better or touch-typing at 28 wpm, and CISC 300 or CISC 310 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces the use of electronic spreadsheet programs. The course includes designing a spreadsheet, developing formulas for automatic calculations, using special functions, developing lists, and producing printed reports. Graphic capabilities are presented. The course may be taken four times for credit on a different software package, version, or operating system -- provided no version or package is repeated.

### **CISA 311 Intermediate Electronic Spreadsheets 1 Unit**

*Prerequisite:* CISA 310 with a grade of "C" or better

*Advisory:* BUSTEC 100.1 or BUSTEC 300.1 with a grade of "C" or better or touch-typing at 28 wpm, and CISC 300 and CISC 310 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course covers intermediate and advanced features in electronic spreadsheet software. Topics include using multiple worksheets and workbooks, web tools, scenario management, solver, imported data, the lookup function, and macros. The course may be taken four times for credit on a different software package, version, or operating system -- provided no package or version is repeated.

### **CISA 323 Database Management using Microsoft Access 2 Units**

*Prerequisite:* CISC 300 or 310 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course introduces database management systems in a single-user environment. Students will learn to use a Windows-based application, including the full development of an original database. Topics include database objects, data types, data integrity, relational tables, complex queries, forms, reports, sharing data with other Windows applications, and data maintenance. Students who have completed both CISA 320 and CISA 321 may not receive credit for this course.

### **CISA 324 Database Management using SQL 2 Units**

*Prerequisite:* CISA 323 with a grade of "C" or better; or CISA 320 and CISA 321 with grades of "C" or better

*Advisory:* CISC 310 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course will extend the capabilities of students who have completed a first course in microcomputer database management, with emphasis on database design, reporting, application building, and utilization of files created using other software. Using Structured Query Language (SQL) in multiple relational database environments, students will design and implement practical database applications. Topics include relational database design, data normalization, administering databases on a server, and creating queries using select statements.

### **CISA 340 Presentation Graphics 2 Units**

*Prerequisite:* None.

*Advisory:* BUSTEC 300.1 or BUSTEC 100.1 or touch typing at 28 wpm, and CISC 300 or CISC 310 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course presents an in-depth look at using computers as a graphics presentation tool to assist oral, written, and on-screen presentations. Topics include system requirements, graphic software, elements of a good presentation, types of graphics, and designing slide show techniques for visual presentations. Methods on how to edit and format presentations, animation, organizational charts, and clips (graphics, sounds, or video) will also be covered. Designing presentations linked to word processing, spreadsheet, or database programs is included. Students will use a variety of computer hardware and software to produce individual and/or group projects. The course may be taken four times for credit on a different software package version, or operating system -- provided no package or version is repeated.

**CISA 499 Experimental Offering in Computer Information Science - Applications .5-4 Units**

*Prerequisite: None*  
*Course Transferable to CSU*  
*Hours: 54 hours LEC; 36 hours LAB*  
 See Experimental Offering

## Computer Info Science - Core (CISC)

**CISC 90 Computer Skills for New Users 1 Unit**

*Prerequisite: None.*  
*Hours: 9 hours LEC; 27 hours LAB*  
 This course introduces the features of the microcomputer to the beginning student. The student will learn how to purchase a computer system, how the computer works, and what computers can do, including a brief overview of Windows operations, word processing, spreadsheets, the use of the Internet, and e-mail. This course does not fulfill the prerequisite requirement for any Computer Information Science course in applications, programming, web page, or networking. This course is non-degree, non-certificate applicable. This course is graded as a Pass/No Pass course only. This course will prepare the student for beginning computer courses.

**CISC 110 Using ePortfolios 1 Unit**

*Prerequisite: None.*  
*Hours: 18 hours LEC*  
 The course covers ePortfolios, which is the electronic equivalent of portfolio applications. It is designed to demonstrate how students can assemble digital content files of any types and structured data forms to build multiple, tailored views of these items and share each of the views with appropriate third parties over the Internet. Students will learn how to use search engines and complete on-line resumes and applications as well as include appropriate work samples, grades and essays, biographical information, in-progress course work, digital media, special versions of different resumes for different jobs, reference letters, transcripts, writing samples, and other work products.

**CISC 295 Independent Studies in Computer Information Science - Core 1-3 Units**

*Prerequisite: None.*  
*Hours: 54 hours LEC*  
 An independent studies project involves an individual student or small group of students in study, research, or activities beyond the regularly offered courses in Computer Information Science. This course may be taken four times for credit provided no topic is repeated.

**CISC 299 Experimental Offering in Computer Information Science-Core .5-4 Units**

*Prerequisite: None*  
*Hours: 72 hours LEC*  
 See Experimental Offerings

**CISC 300 Computer Familiarization 1 Unit**

*Prerequisite: None.*  
*Advisory: BUSTEC 300.1 or BUSTEC 100.1 with a grade of "C" or better or touch typing at 28 wpm.*  
*Course Transferable to CSU*  
*Hours: 18 hours LEC; 18 hours LAB*

This course acquaints students with how computers are used in the home and in business functions. The course emphasizes microcomputers, how they work, how they can be used, and the terminology of the computer world. Microcomputer applications using the Windows environment are presented with hands-on laboratory assignments. This course does not serve as a prerequisite to computer science programming courses, but does serve as a prerequisite/advisory for Computer Information Science application courses. The course is specially designed for students wanting a very general, non-technical, introductory course in computers.

**CISC 305 Introduction to the Internet 1 Unit**

*Prerequisite: None.*  
*Advisory: CISC 300 or CISC 310 with a grade of "C" or better*  
*Course Transferable to CSU*  
*Hours: 18 hours LEC*

This course explains how the Internet works, how to connect to the Internet, and how to use Internet services. Laws that guide the use of the Internet will be covered. Other topics include Internet protocols, e-mail, news groups, discussion lists, connecting to a remote server, file transfer protocol (FTP), World Wide Web (WWW), and emerging technologies.

**CISC 306 Introduction to Web Page Creation 1 Unit**

*Prerequisite: CISC 300 or 310 with a grade of "C" or better*  
*Advisory: CISC 305 with a grade of "C" or better*  
*Course Transferable to CSU*  
*Hours: 18 hours LEC; 18 hours LAB*

This course covers the production of Web pages, including formatting, layout, construction, and presentation. A current markup language, such as eXtensible Hyper Text Markup Language (XHTML), is used to format Web pages. Students may also use a Web authoring tool to create Web pages.

**CISC 308 Exploring Computer Environments and the Internet 1 Unit**

*Prerequisite: None.*  
*Course Transferable to CSU*  
*Hours: 18 hours LEC; 18 hours LAB*

This course acquaints the student with the fundamentals of micro-computer hardware, software, and computer networking, focusing on widely used hardware and operating system, IBM personal computers, and the Windows operating systems. The fundamentals of the Internet and Internet tools are introduced. This course meets the requirement for MIS 1 at CSUS. This course does not meet the requirements for SCC CIS certificates and degrees.

**CISC 310 Introduction to Computer Information Science 3 Units**

*Prerequisite: None.*  
*Advisory: CISC 300 with a grade of "C" or better.*  
*General Education: AA/AS Area II(b)*  
*Course Transferable to UC/CSU*  
*Hours: 54 hours LEC*

This course is a survey of the computer science field covering the function and purpose of computer hardware and software, computer programming concepts, productivity software, employment opportunities, and the social impact of the computer.

**CISC 320      Operating Systems      1 Unit**

*Prerequisite:* None.

*Advisory:* CISC 300 or CISC 310 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces the microcomputer operating system. Topics include basic features, file and program management, disk management commands, and menus. This course may be taken four times for credit on different operating systems or versions -- provided no version is repeated.

**CISC 321      Intermediate Operating Systems      1 Unit**

*Prerequisite:* CISC 320 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

The course covers intermediate and advanced commands, effective utility use, advanced batch files/script files, program logic, disk organization, making user-friendly systems, and anticipating and preventing system problems. The course may be taken four times using different operating systems or versions -- provided no version is repeated.

**CISC 323      Linux Operating System      1 Unit**

*Prerequisite:* None.

*Advisory:* CISC 300 with a grade of "C" or better and ability to touch type.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces the Linux operating system for microcomputers. Concepts include the kernel, file structures, daemons, Graphical User Interfaces (GUI), open source, file security, and permissions. Procedures for installing software, basic system administration and utilities, the Bourne Again Shell (BASH), command line interface utilities, and introduction to scripting topics are also covered.

**CISC 324      Intermediate Linux Operating System      1 Unit**

*Prerequisite:* CISC 323 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course is a continuation of CISC 323. Topics include boot loaders, Linux devices, and Command Line Interface (CLI) system management utilities. It covers advanced Bourne Again Shell (BASH) shell scripting, including looping and decision making logic structures. Alternates to the BASH shell and regular expressions and text stream editors are introduced.

**CISC 351      Introduction to Local Area Networks      1 Unit**

*Prerequisite:* None.

*Advisory:* CISC 320 and CISC 355 with grades of "C" or better

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces local area networks and provides hands-on training in Local Area Network (LAN) applications and administration. Topics include planning, installing, and maintaining a LAN, responsibilities of the system administrator, and human implications.

**CISC 355      Introduction to Data Communications      1.5 Units**

*Prerequisite:* None.

*Advisory:* CISC 300 or CISC 320 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 27 hours LEC

This course introduces business data communications. It covers media, telecommunications, protocols, interfaces, and packet switching. The Internet will be used for locating, viewing, printing, and downloading information.

**CISC 360      Microcomputer Support and Maintenance      4 Units**

*Prerequisite:* None.

*Advisory:* CISC 320 and CISC 351 with grades of "C" or better

*Course Transferable to CSU*

*Hours:* 36 hours LEC; 108 hours LAB

This course is an introduction to technical support and maintenance of microcomputers. It includes lecture and hands-on application of help desk concepts and responsibilities, hardware and software troubleshooting in a networked environment, system documentation, and technical communication skills. Seventy-two hours of internship are required as part of the laboratory component of the course.

**CISC 495      Independent Studies in Computer Information Science - Core      1-3 Units**

*Prerequisite:* None.

*Course Transferable to UC/CSU*

*Hours:* 54 hours LEC

This is an independent studies course. The topics are to be arranged between the instructor and the student. UC transfer credit will be awarded only after the course has been evaluated by the enrolling UC campus. The units completed for this course cannot be counted towards the minimum 60 units required for admissions. This course may be taken four times for credit provided no topic is repeated.

**CISC 498      Work Experience in Computer Information Science - Core      1-4 Units**

*Prerequisite:* None.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 300 hours LAB

This course provides students with opportunities to develop marketable skills in preparation for employment or advancement within their current jobs. Course content includes understanding the application of education to the workforce; completion of required forms, which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. During the course of the semester, the student is required to fulfill an 18 hour orientation and 75 hours of related paid work experience or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. The course may be taken up to 4 times when there is new or expanded learning on the job for a maximum of 16 units.

**CISC 499 Experimental Offering in Computer Information Science-Core .5-4 Units**

*Prerequisite: None*

*Course Transferable to UC/CSU*

*Hours: 54 hours LEC; 36 hours LAB*

See Experimental Offerings. UC transfer credit will be awarded only after the course has been evaluated by the enrolling UC campus. The units completed for this course cannot be counted towards the minimum 60 units required for admissions.

## Computer Info Science - Network (CISN)

**CISN 299 Experimental Offering in Computer Information Science - Network .5-4 Units**

*Prerequisite: None*

*Hours: 72 hours LEC*

See Experimental Offerings

**CISN 300 Network Systems Administration 3 Units**

*Prerequisite: None.*

*Advisory: CISC 320 (Windows or Linux) with a grade of "C" or better.*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 48 hours LEC; 28 hours LAB*

This course covers the administration of a server in a client/server network. Topics include designing a basic network, installing, and configuring a network share, setting up and managing network printers, backing up servers, monitoring and troubleshooting network resources, and establishing policies and procedures for network operations. This course covers materials required for the Microsoft Networking examinations. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 302 Intermediate Network Systems Administration 3 Units**

*Prerequisite: CISN 300 with a grade of "C" or better*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 48 hours LEC; 28 hours LAB*

This course continues the further study of systems administration in a client/server network. Topics include configuring the server environment, implementing system policies, implementing and managing fault-tolerant disk volumes, managing applications, managing connectivity for different network and client operating systems, managing remote servers, implementing directory replication and file synchronization, and advanced troubleshooting techniques. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 303 Network Administration - Linux Server 3 Units**

*Prerequisite: None.*

*Advisory: CISC 323 with a grade of "C" or better*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 36 hours LAB*

This course provides coverage of Linux Network Administration. Topics covered include connecting to a network; utilizing network utilities; planning, accessing, and managing file systems; planning and implementing login and file system security; administering and maintaining the user and printer environment; protecting network data; and installing network applications. This course covers material required for software manufacturer's certification. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 304 Networking Technologies 3 Units**

*Prerequisite: CISC 320 with a grade of "C" or better*

*Advisory: CISC 355 with a grade of "C" or better*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 48 hours LEC; 28 hours LAB*

This course provides a comprehensive survey of local and wide area networks, technologies, protocols, and connectivity. Topics covered include network topologies, the Open Systems Interconnection seven-layer model for communication, communication protocols and standards, access methods, and data translation and transmission equipment and media. This course is intended to prepare students for the COMPTIA N+ industry certification. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 306 Advanced Network Systems Administration 3 Units**

*Prerequisite: CISN 300 with a grade of "C" or better*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 48 hours LEC; 28 hours LAB*

This course covers the administration of a server in an enterprise network. Topics include designing an enterprise network, optimizing network servers for enterprise-related roles, managing enterprise users, groups and resources, planning and implementing connectivity to other networks within the enterprise, server and network optimization, and troubleshooting techniques at the enterprise level. This course covers material required for the Microsoft Networking examinations. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 307 Windows Active Directory Services 3 Units**

*Prerequisite: CISC 320 with a grade of "C" or better*

*Course Transferable to CSU*

*Hours: 48 hours LEC; 28 hours LAB*

This course covers installing, configuring, and administering Microsoft Windows Active Directory services. It also focuses on implementing Group Policy and understanding the Group Policy tasks required to manage users and computers. Group Policies are used to configure and manage the user desktop environment, configure and manage software, and implement and manage security settings. Installation and configuration of Domain Naming System (DNS) and Windows Internet Naming System (WINS) is covered, as well as publishing, replication, and the backup of the directory services data base. This course covers material required for the Microsoft Networking examinations. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 308      Internetworking with TCP/IP      3 Units**

*Prerequisite:* CISN 300 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 48 hours LEC; 28 hours LAB

This course covers the further implementation of the TCP/IP protocol suite in an enterprise network. Topics include installing, configuring, and testing TCP/IP, planning and implementing sub-networks, managing IP address assignments and IP routing, installing, and configuring DNS, TCP/IP network printing, troubleshooting the network with TCP/IP utilities, and planning for IPv6. This course covers material required for the Microsoft Networking examinations. Recertification is required when the operating system has been updated. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 315      Advanced Network Administration      2 Units**

*Prerequisite:* CISN 303 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 36 hours LEC; 18 hours LAB

This course covers topics necessary for an experienced network administrator to monitor, maintain, and improve the performance of an existing Local Area Network (LAN). This course covers part of the material required for software manufacturer's certification. This course may be taken twice for credit based on industry certification time limits.

**CISN 320      Designing Windows Directory Services      3 Units**

*Prerequisite:* CISN 307 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 45 hours LEC; 27 hours LAB

This course provides students with further knowledge and skills necessary to design a Microsoft Windows directory services infrastructure in an enterprise network. At the end of the course, students will be able to describe guidelines for gathering business and administrative information from an organization and explain how to use the information to design an Active Directory structure for an enterprise; design an Active Directory naming strategy; develop a plan to secure and delegate administrative authority over Active Directory objects based on the administrative model of an organization; identify business needs and scenarios that may require modifications of the Active Directory schema; create an Active Directory design based on administrative Group Policy requirements defined by business needs; design a site topology for a multi-domain organization; and design an Active Directory replication plan based on the site topology design.

**CISN 336      Wireless Technologies      3 Units**

*Prerequisite:* CISN 341 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 20 hours LAB

This course on wireless networking focuses on the design, planning, implementation, operation, and troubleshooting of wireless networks. It covers a comprehensive overview of technologies, security, and design best practices with particular emphasis on hands-on skills in set up and troubleshooting; 802.11a and 802.11b technologies, products, and solutions; site surveys; resilient WLAN design, installation, and configuration; WLAN security and vendor interoperability strategies. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 340      CISCO Networking Academy (CCNA)<sup>™</sup>: Data Communication and Networking      3 Units**

*Prerequisite:* None.

*Advisory:* CISC 300 or CISC 310, and CISC 320 with grades of "C" or better.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 20 hours LAB

This course is designed to introduce students to data communication and networking fundamentals. The course covers networking addressing which includes calculations and conversions between binary, decimal, and hexadecimal numbering systems. It also surveys data communication hardware and software components and basic networking concepts. Topics covered include data communication, the OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the first course in preparation for CISCO CCNA certification examination. SCC is a certified CISCO Networking Academy, and all courses are taught by CISCO Certified Academy Instructors (CCAI). This course may be taken up to four times for credit based on industry certification time limits.

**CISN 341      CISCO Networking Academy (CCNA)<sup>™</sup>: Networking Theory and Routing Technologies      3 Units**

*Prerequisite:* CISN 340 with a grade of "C" or better

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 20 hours LAB

This course covers networking theory and routing technologies, including OSI Model, beginning router configurations, and routed and routing protocols. This is the second course in preparation for CISCO CCNA certification examination. It continues and expands the study of binary, decimal, and hexadecimal numbering systems to change variable length sub-net mask. SCC is a certified CISCO Networking Academy, and all courses are taught by CISCO Certified Academy Instructors (CCAI). This course may be taken up to four times for credit based on industry certification time limits.

**CISN 342      CISCO Networking Academy (CCNA)<sup>™</sup>: Advanced Routing and Switching      3 Units**

*Prerequisite:* CISN 341 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 20 hours LAB

This course provides advanced routing and switching technologies. Topics include advanced router configurations, network management, advanced network design, LAN switching, and VLANs. This is the third course in preparation for CISCO CCNA certification examination. SCC is a certified CISCO Networking Academy, and all courses are taught by CISCO Certified Academy Instructors (CCAI). This course may be taken up to four times for credit based on industry certification time limits.

**CISN 343 CISCO Networking Academy (CCNA)<sup>™</sup>: Wide Area Network and Project-Based 3 Units**

*Prerequisite: CISN 342 with a grade of "C" or better  
Course Transferable to CSU*

*Hours: 54 hours LEC; 20 hours LAB*

This course develops knowledge and skills to design and configure advanced wide area network (WAN) projects using CISCO IOS command set. This is the fourth course in preparation for CISCO CCNA certification examination. SCC is a certified CISCO Networking Academy, and all courses are taught by CISCO Certified Academy Instructors (CCAI). This course may be taken up to four times for credit based on industry certification time limits.

**CISN 346 Network Design and Projects 3.5 Units**

*Prerequisite: CISN 341 with a grade of "C" or better  
General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 27 hours LAB*

This course covers various state-of-the-art topics to design CISCO network infrastructures to support network services and solutions. Individual topics may include: introduction to voice design concepts; design principles; network structure and IP addressing design concepts; basic campus switching design and WAN design considerations; routing protocol design considerations; introduction to security design concepts; and network management design concepts. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 350 CISCO Networking Academy (CCNP)<sup>™</sup>: Advanced Router Configuration 3 Units**

*Prerequisite: CISN 343 with a grade of "C" or better or valid CISCO Certified Network Associate (CCNA) certification*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 20 hours LAB*

This course develops knowledge and skills in advanced outer configuration using CISCO IOS command set. Topics include advanced IOS command set, network design, scalable routing protocols (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), and Border Gateway protocol (BGP). This is the first course in a series of four advanced courses in preparation for CISCO certification examination. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 351 CISCO Networking Academy (CCNP)<sup>™</sup>: Remote Access 3 Units**

*Prerequisite: CISN 343 with a grade of "C" or better or valid CISCO Certified Network Associate (CCNA) certification*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 20 hours LAB*

This course develops knowledge and skills in building remote access networks. Topics include design, configuration, enabling on-demand connections, enabling permanent connections, scaling remote access networks and remote access network setup, and management. This is the second course in a series of four advanced courses in preparation for the CISCO certification examination. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 352 CISCO Networking Academy (CCNP)<sup>™</sup>: Multi-Layer Switching 3 Units**

*Prerequisite: CISN 343 with a grade of "C" or better or valid CISCO Certified Network Associate (CCNA) certification*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 20 hours LAB*

This course develops knowledge and skills in multi-layer switched networks. Topics include how routing and switching technologies work together, building campus networks using multi-layer switching technologies, using VLAN, improving IP performance, and securing the campus network model. This is the third course in a series of four advanced courses in preparation for the CISCO certification examination. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 353 CISCO Networking Academy (CCNP)<sup>™</sup>: Internetwork Troubleshooting 3 Units**

*Prerequisite: CISN 343 with a grade of "C" or better or valid CISCO Certified Network Associate (CCNA) certification*

*Course Transferable to CSU*

*Hours: 54 hours LEC; 20 hours LAB*

This course develops knowledge and skills in fundamental hardware maintenance and troubleshooting routers and switches. Topics include managing and maintaining networks, troubleshooting tools and methodology, routing and routed protocol troubleshooting, campus switch and VLAN troubleshooting and WAN troubleshooting. This is the fourth course in a series of four advanced courses in preparation for the CISCO certification examination. This course may be taken up to four times for credit based on industry certification time limits.

**CISN 374 Messaging Server Administration 3 Units**

*Prerequisite: CISN 300 with a grade of "C" or better.*

*Course Transferable to CSU*

*Hours: 45 hours LEC; 27 hours LAB*

This course covers the installation and administration of messaging servers. Topics include the installation, configuration, management, and tuning of mail and messaging services on both servers and clients, mail access protocols, security issues, and Internet connectivity.

**CISN 378 Database Administration for Microsoft SQL Server 3 Units**

*Prerequisite: CISN 300 with a grade of "C" or better*

*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*

*Hours: 45 hours LEC; 27 hours LAB*

This course provides students with the knowledge and technical skills required to install, configure, administer, and troubleshoot the client/server database management system of Microsoft SQL Server. The students will also learn to manage files and databases; choose and configure a login security method; plan and implement database permissions; secure SQL Server in an enterprise network; perform and automate administrative tasks; create custom administrative tools; monitor and optimize SQL Server performance; and replicate data from one SQL Server to another.

**CISN 499 Experimental Offering in Computer Information Science-Network .5-4 Units**

*Prerequisite: None*

*Course Transferable to CSU*

*Hours: 72 hours LEC*

See Experimental Offerings



**CISP 440 Discrete Structures for Computer Science 3 Units**

*Prerequisite:* CISP 430 and MATH 370 with grades of "C" or better  
*General Education:* AA/AS Area II(b); CSU Area B4; IGETC Area 2  
*Course Transferable to UC/CSU*  
*Hours:* 54 hours LEC

This course introduces the essential discrete structures used in computer science with emphasis on their applications. Topics to be covered include: elementary formal logic and set theory, elementary combinatorics, recursive programming and algorithm analysis, digital logic and switching and combinatorial circuits, and computer arithmetic. Computer programming assignments will be included.

**CISP 452 Introduction to Systems Programming 3 Units**

*Prerequisite:* CISP 430 with a grade of "C" or better  
*General Education:* AA/AS Area II(b)  
*Course Transferable to UC/CSU*  
*Hours:* 54 hours LEC

This course is an introduction to Systems Programming concepts using the C language. The course covers features of the C language commonly used in Systems Programming. Topics include C preprocessor macros, file systems, shells and shell script programming, make files and Source Code Control Systems (SCCS), and program relocation and linking concepts. Knowledge of the C language and data structures is required.

**CISP 457 Computer Systems Analysis and Project Management 3 Units**

*Prerequisite:* CISP 301 with a grade of "C" or better; and any one of the following: CISP 320, CISP 360, CISP 370, CISP 400, or CISP 401 with grade of "C" or better.  
*Course Transferable to CSU*  
*Hours:* 54 hours LEC

This course covers the methods used to analyze, design, and implement a computer system that meets client business needs. The methodology emphasizes the skills needed by a systems analyst throughout the steps of a system development life cycle. These steps include system feasibility, analysis, design, implementation, documentation, and evaluation.

**CISP 499 Experimental Offering in Computer Information Science-Programming .5-4 Units**

*Prerequisite:* None  
*Course Transferable to UC/CSU*  
*Hours:* 90 hours LEC

See Experimental Offerings. UC transfer credit will be awarded only after the course has been evaluated by the enrolling UC campus. The units completed for this course cannot be counted towards the minimum 60 units required for admissions.

**Computer Information Science - Security (CISS)****CISS 300 Introduction to Information Systems Security 1 Unit**

*Prerequisite:* None.  
*Course Transferable to CSU*  
*Hours:* 18 hours LEC; 18 hours LAB

This course provides an introduction to network-based and Internet-based security applications and standards. Topics include cryptography, security protocols, network security applications, encryption, hash functions, digital signatures, viruses, and key exchange.

**CISS 301 Ethical Hacking 2 Units**

*Prerequisite:* None.  
*Advisory:* CISC 320 (Operating Systems) with a grade of "C" or better.  
*Course Transferable to CSU*  
*Hours:* 27 hours LEC; 27 hours LAB

This course explores ways in which security for a stand-alone personal computer (PC) and a network-connected PC can be compromised. It introduces basic security concepts, principles, and "best practices." It also explores ways in which the security of a PC can be checked and evaluated. Principles of ethical hacking are discussed. Internal and external security threats are discussed, including viruses, worms, Trojans, scripts, and other malicious e-mail content. Network vulnerabilities, common exploits, and basic counter measures are also covered.

**CISS 310 Network Security Fundamentals 3 Units**

*Prerequisite:* None.  
*Advisory:* CISP 340 or CISP 300 or CISP 304 with a grade of "C" or better  
*Course Transferable to CSU*  
*Hours:* 45 hours LEC; 27 hours LAB

This course provides the fundamental knowledge needed to analyze risks to the system and implement a workable security policy that protects information assets from potential intrusion, damage, or theft. Students will learn which countermeasures to deploy to thwart potential attacks. This course will also prepare students for CompTIA's Security+ Exam. This course may be taken up to four times for credit based on industry certification time limits.

**CISS 320 Implementing Network Security and Counter Measures 3 Units**

*Prerequisite:* CISS 310 with a grade of "C" or better  
*Course Transferable to CSU*  
*Hours:* 45 hours LEC; 27 hours LAB

In this course, students will learn how to evaluate, implement, and manage secure remote-access technologies in order to prevent systems from attack. Topics include risk analysis, choosing and setting up Virtual Private Networks and Intrusion Detection systems. This course may be taken up to four times for credit based on industry certification time limits.

**CISS 330 Implementing Internet Security and Firewalls 3 Units**

*Prerequisite:* CISS 310 with a grade of "C" or better  
*Course Transferable to CSU*  
*Hours:* 54 hours LEC; 18 hours LAB

Students will learn how to allow access to key services while maintaining an organization's security, as well as how to implement firewall-to-firewall Virtual Private Networks (VPNs). This course may be taken up to four times for credit based on industry certification time limits.

## Computer Info Science - Web (CISW)

### CISS 341 Implementing Windows Operating System Security 3 Units

*Prerequisite:* None.

*Advisory:* CISC 320 and CISS 310; with grades of "C" or better  
Course Transferable to CSU

*Hours:* 45 hours LEC; 27 hours LAB

This course will provide in-depth explanations of operating system security features as well as step-by-step configuration guides for proper operating system configuration. It also provides the knowledge and skills students will need to know in order to maintain the integrity, authenticity, availability, and privacy of data. This course may be taken up to four times for credit based on industry certification time limits.

### CISS 342 Implementing Linux Operating System Security 3 Units

*Prerequisite:* None.

*Advisory:* CISC 323 and CISS 310 with grades of "C" or better  
Course Transferable to CSU

*Hours:* 45 hours LEC; 27 hours LAB

This course provides the knowledge and skills you need to establish security for the Linux platform. It will present in-depth explanations of operating system security features as well as step-by-step configuration guides for proper operating system configuration. This course also will cover the knowledge and skills students will need to maintain the integrity, authenticity, availability, and privacy of data. This course may be taken up to four times for credit based on industry certification time limits.

### CISS 350 Disaster Recovery 3 Units

*Prerequisite:* None.

*Advisory:* CISS 310 with a grade of "C" or better  
Course Transferable to CSU

*Hours:* 54 hours LEC

This course presents methods to identify vulnerabilities and implement appropriate countermeasures to prevent and mitigate failure risks for the business enterprise. This course covers but is not limited to an understanding of what disaster recovery is, development of a disaster recovery plan, and development and implementation of Policies and Procedures. This course may be taken up to four times for credit based on industry certification time limits.

### CISS 360 Computer Forensics and Investigation 3 Units

*Prerequisite:* None.

*Advisory:* CISC 320 and CISS 310 with grades of "C" or better  
Course Transferable to CSU

*Hours:* 45 hours LEC; 27 hours LAB

This course is an introduction to the methods used to properly conduct a computer forensics investigation beginning with a discussion of ethics, while mapping to the objectives of the International Association of Computer Investigative Specialists (IACIS) certification. Topics include, but are not limited to, an overview of computer forensics as a profession; the computer investigation process; understanding operating systems boot processes and disk structures; data acquisition and analysis; technical writing; and a review of familiar computer forensics tools. This course may be taken up to four times for credit based on industry certification time limits.

### CISW 299 Experimental Offering in Computer Information Science - Web .5-4 Units

*Prerequisite:* None

*Hours:* 72 hours LEC

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### CISW 304 Cascading Style Sheets 2 Units

*Prerequisite:* CISW 300 or 320 with a grade of "C" or better  
Course Transferable to CSU

*Hours:* 27 hours LEC; 27 hours LAB

This course continues the study of technical aspects of standards-based Web design for experienced students and Web professionals. Topics include the separation of content from presentation, dynamic user interaction, and designing for alternative devices, using Cascading Style Sheets (CSS) in combination with Extensible Hypertext Markup Language (XHTML).

### CISW 320 Introduction to Web Site Development 3 Units

*Prerequisite:* CISC 320 or 323 with a grade of "C" or better; or equivalent experience using files and folders on a Personal Computer (PC).

*Advisory:* CISC 305 with a grade of "C" or better or experience using the World Wide Web.

Course Transferable to CSU

*Hours:* 54 hours LEC

This course is an introduction to the technical aspects of Web site development for students and Web professionals. Topics include creating Web pages with markup languages, including XHTML, cascading style sheets (CSS), the use of images and other media on the Web, interactive tools like forms and image maps, file management for the Web, and uploading files via File Transfer Protocol (FTP) to a Web server. Emphasis will be on the study and implementation of current World Wide Web Consortium (W3C) standards and a structured approach to Web site development in which students will identify the information dissemination needs of a client and then develop and implement an appropriate Web solution. This course was formerly known as CISW 300 and students who have completed CISW 320 or CISW 300 in the past four years may not receive credit for this course. Students may be asked to repeat this course after the release of newer versions of HTML, XHTML and/or CSS.

### CISW 321 Web Site Development using Dreamweaver 3 Units

*Prerequisite:* CISW 300, CISW 320, or GCOM 361 with a grade of "C" or better; or equivalent experience

Course Transferable to CSU

*Hours:* 36 hours LEC; 54 hours LAB

This course covers the use of Dreamweaver, a visual Web-authoring tool, to develop and implement Web sites. The topics covered include: creating Web pages that contain text, images, multimedia, links, tables, forms, Cascading Style Sheets and image maps, developing effective Web site structures, using Web site management tools, Web site documentation, making site-wide updates to a Web site, and extending Dreamweaver. Students will work individually and as a member of a team to plan, implement, test, and evaluate Web sites.

**CISW 325 Intermediate Web Site Development 4 Units**

*Prerequisite:* CISW 300 or 320 with a grade of "C" or better; Students must have experience hand coding Web pages with Hypertext Markup Language (HTML), Extensible Hypertext Markup Language (XHTML) and Cascading Style Sheets (CSS) for content, structure and presentation in compliance with W3C standards and recommendations.

*Advisory:* CISP 301 with a grade of "C" or better or experience writing programs in any high level programming language.

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 54 hours LAB

This course introduces the systematic development of interactive Web sites to experienced students and Web professionals. Topics include dynamic HTML, form validation and processing, client-side programming with JavaScript, server-side programming with hypertext pre-processor (PHP) or CGI scripting with Perl, and database-driven Web development. This course was formerly known as CISW 310 and students who have received credit for CISW 310, Advanced Web Publishing, may not receive credit for this class.

**CISW 350 Imaging for the Web 1 Unit**

*Prerequisite:* CISC 306, CISW 300, or CISW 320 with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course covers designing graphics for the Web, not intended for Graphic Communication students. Industry standard graphic software is used to create original graphics as well as to manipulate found imagery. Topics include developing graphic elements for a Website using a visual theme, creating buttons and intuitive navigational elements, making background textures and images, understanding Web file formats, scanning, and simple animation. This course may be taken twice for credit on a different platform or graphics software package. This course is not open to students who have completed GCOM 360 or CISW 351.

**CISW 370 Designing Accessible Web Sites 1 Unit**

*Prerequisite:* CISW 300, CISW 320, or GCOM 361 with a grade of "C" or better; or equivalent experience designing Web pages with Extensible Hypertext Markup Language (XHTML).

*Course Transferable to CSU*

*Hours:* 18 hours LEC

This course provides an overview of the methods that are used to design accessible Websites, including access tools for people with disabilities. Current legal requirements for accessible Websites, especially the Americans with Disabilities Act (ADA), are emphasized.

**CISW 400 Client-side Web Scripting 4 Units**

*Prerequisite:* CISW 300 or 320 with a grade of "C" or better; or equivalent experience hand coding Web pages.

*Advisory:* CISP 301 with grades of "C" or better or equivalent experience writing programs in any high level programming language.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 54 hours LAB

This course emphasizes the creation of dynamic and interactive Web sites using a client-side scripting language such as Javascript or AJAX. Topics include the Document Object Model that defines structured Web pages, core features of the client-side scripting language, event handling, control of windows and frames, functions, and form validation. This course may be taken twice with a different client-side Web scripting language.

**CISW 405 ActionScript for Flash 3 Units**

*Prerequisite:* GCOM 363 with a grade of "C" or better

*Advisory:* CISP 301 with a grade of "C" or better or any high level programming language.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC

This course introduces Macromedia Flash users to programming with ActionScript, including using ActionScript to animate, process data, create dynamic content, and manipulate components. The course emphasizes the object-oriented capabilities of Macromedia Flash and cover how to use ActionScript objects, methods, events, properties, and functions, with an eye toward ActionScript best practices.

**CISW 410 Middleware Web Scripting 4 Units**

*Prerequisite:* CISW 320 or CISW 300 with a grade of "C" or better AND CISP 301 or one programming course with a grade of "C" or better or any programming experience.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 54 hours LAB

This course emphasizes the creation of interactive Websites using a middleware Web scripting environment such as PHP, ASP, or ASP.NET. Topics include core features of the middleware Web scripting language, embedding server commands in HTML pages, control structures, functions, arrays, form validations, cookies, environmental variables, email applications, the .NET environment, and database driven Web applications. This course may be taken three times in a different middleware Web scripting environment.

**CISW 411 Middleware Scripting Database Web Applications 2 Units**

*Prerequisite:* CISW 320 and CISW 410 with grades of "C" or better.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course includes interactive database applications for the Web using a database and middleware scripting language. Topics include organizing data, developing tables for databases, creating middleware scripts that add, delete, sort, edit, and merge the data in the database. Maintaining database integrity and using DHTML or other code to streamline certain client side functions such as form validation are covered. Students may bring their own real Web applications to use as a project. This course may be taken two times for credit using different languages or projects.

**CISW 420 Server-side Web Scripting 4 Units**

*Prerequisite:* CISW 320 or CISW 300 with a grade of "C" or better.

*Advisory:* CISW 325 with a grade of "C" or better, or CISP 301 with a grade of "C" or better, or experience writing programs in any high level programming language.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 54 hours LEC; 54 hours LAB

This course emphasizes the creation of interactive Websites using a server-side scripting language such as Perl or Java. Topics include core features of the server-side scripting language, control structures, functions, arrays, form validations, regular expressions, cookies, environmental variables, email applications, and database-driven Web applications. This course may be taken twice with a different server-side scripting language.

**CISW 440 XML: Introduction to Extensible Markup Language 2 Units**

*Prerequisite:* CISW 320 or CISW 300 with a grade of "C" or better.

*Advisory:* CISA 323 or CISP 350 with a grade of "C" or better.

*General Education:* AA/AS Area II(b)

*Course Transferable to CSU*

*Hours:* 36 hours LEC

Extensible Markup Language (XML) is a universal method for representing information that is especially well suited for distribution over the Internet. This course will address the most fundamental XML questions - what XML is, why it is needed, and how it can be used. Students will learn the most current, practical XML technologies available at the present time. This course may be taken two times for credit on different versions of XML.

**CISW 470 Web Projects 3 Units**

*Prerequisite:* One of the following: CISW 325, CISW 410, CISW 420, GCOM 361, GCOM 362, GCOM 363, or equivalent with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 36 hours LEC; 54 hours LAB

This course focuses on Web project management on a real-world Website. Emphasis will be placed on the project development life cycle including design specification, research, production, modification, and presentation. Students will learn how to prepare a cost estimate for the project. Web projects utilized in the class will be multifaceted, approaching the complexity that individuals would be expected to encounter in the Web development industry. (Students may bring their own Web Projects to class.)

**CISW 499 Experimental Offering in Computer Information Science-Web .5-4 Units**

*Prerequisite:* None

*Course Transferable to CSU*

*Hours:* 54 hours LEC

See Experimental Offerings