

# Computer Information Science

## CISA, CISC, CISN, CISP, CISS, CISW

Associate in Science Degree

Certificate of Achievement

Certificate of Completion

Computer Science, Degree and Certificate of Achievement

Management Information Science, Degree and Certificate of Achievement

Database Management, Certificate of Achievement

Programming, Certificate of Achievement

Information Processing, Degree

Information Processing Specialist, Certificate of Achievement

Information Processing Technician, Certificate of Achievement or Certificate of Completion, Level 3

Word Processing Technician, Certificate of Completion, Level 2 or 3

Information Systems Security, Degree and Certificate of Achievement

Department of Computer Information Science

Division of Business

Shirley Short, Dean

Business Building 213

916-558-2581

Network Administration, Degree and Certificate of Achievement

Network Design, Degree and Certificate of Achievement

Advanced CISCO Networking, Certificate of Achievement

Microcomputer Technician, Degree and Certificate of Achievement

PC Support, Certificate of Achievement

Web Developer, Degree and Certificate of Achievement

Active Server Pages Developer, Certificate of Achievement

International Computer Driving License, Certificate of Completion, Level 2

Webmaster, Level 1, Certificate of Achievement

Webmaster, Level 2, Certificate of Achievement

### Career Opportunities

Technical positions include: application developer, computer programmer, database administrator, database developer, database manager, database support assistant, information technology developer, information technology specialist, programmer, software designer, software tester, and systems analyst. Opportunities in networking and security include computer forensics specialist, computer operator, information security systems specialist, network administrator, network designer, network security specialist, network support specialist, network systems engineer, network technical support staff, and network troubleshooter. In the area of web site design and development, positions include: information systems analyst, information technology analyst, web database administrator, web designer, web developer, web server administrator, web systems analyst, web team member, and webmaster. Office related job openings include administrative assistant, assistant documentation specialist, business office employee, data entry personnel, information processing specialist, information technician, microcomputer applications specialist, office clerk, office manager, office supervisor, office worker, and retail clerk.

### Transfer Information

CSU, Sacramento, offers a major in Computer Science through the School of Engineering and Computer Science. These five classes must be completed before students can be admitted as Computer Science or Computer Engineering majors at CSUS: CISP 400 (C++) or CISP 401 (Java), CISP 430 (Data Structures), CISP 310

(Assembly Language), CISP 440 (Discrete Structures), and CISP 452 (Introduction to Systems Programming). Students should plan to take the prerequisites (CISC 310 and CISP 301 concurrently and then CISP 360) with enough time to complete the required courses before transfer. Computer Engineering majors should also take ENGR 400 (Circuits) and general chemistry prior to transfer. It is recommended that students complete Calculus and Physics before transfer and meet with a counselor before the end of the first year at SCC.

CSU, Sacramento, offers a major or minor in Management Information Science as part of the Business Administration degree. Students planning to transfer to CSU, Sacramento School of Business Administration should complete their MIS 001, 002, 003 in the form of our CISA 308, CISA 310, CISC 308 to be admitted to the School of Business. MIS Majors should also complete CISP 370 (VB.NET) before transferring. Students should plan to take the prerequisites (CISC 310 and CISP 301 concurrently) with enough time to complete the required courses before transfer.

Students planning to transfer to CSU, Chico, should include computer-programming languages in C++, Java, assembly language, data structures, one year of calculus, and physics.

Students must also meet university admission requirements and other general education courses as outlined by each university.

# 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 analysts, database administrators, computer support, or help desk specialists, Web developers, and application developers.

Opportunities in networking include network support specialists, network administrators and technicians, network security specialist, computer forensics specialist, Webmasters, Web developers, and Web site designers.

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

- analyze development projects and divide them into smaller production tasks.
- build a project while utilizing the project development model.
- manage a programming project, both individually and as a member of a team, from initial concept through design, programming, debugging, testing, and deployment.
- evaluate a program to determine how it will meet the needs of its intended audience.
- design, write, test, debug, and implement computer programs in a structured language, a low-level language, and an object-oriented language.
- create programs utilizing both Windows and Linux operating systems.

## 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) or CISP 401 Object Oriented Programming with Java (4) .....	4
CISP 430 Data Structures .....	4
A minimum of 6 units from the following:.....	6 <sup>1</sup>
CISC 305 Introduction to the Internet (1)	
CISC 351 Introduction to Local Area Networks (1)	
CISC 355 Introduction to Data Communications (1.5)	
CISN 303 Network Administration - Linux Server (3)	
CISW 320 Introduction to Web Site Development (3)	
CISW 325 Intermediate Web Site Development (4)	
CISP 320 COBOL Programming (4)	
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 Design (3)	

CISS 300 Introduction to Information Systems Security (1)  
CISS 301 Ethical Hacking (2)  
CISS 310 Network Security Fundamentals (3)  
CISW 410 Middleware Web Scripting (4)  
CISC 305 Introduction to the Internet (1)

## Total Units Required

35

<sup>1</sup>SCC transfer students to California State University, Sacramento, College of Engineering and Computer Science who are majoring in Computer Science or Computer Engineering should take CISP 440 and CISP 452 before starting their junior year at CSUS. CSUS Computer Engineering students should also take ENGR 400. SCC transfer students to CSUS, College of Business with MIS major or minor should take CISP 370 before transferring. SCC transfer students to University of California, Davis who are majoring in Computer Science should take CISP 440 before transferring.

## Suggested Electives

BUS 100, BUS 300, BUS 330, CISC 110, ENGWR 300, ESLW 340, MATH 400, MATH 401, MATH 420, MGMT 306, PHYS 410, PHYS 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 option is designed for students preparing for careers in business while using and managing computers effectively. The focus of the program is to develop student proficiency in a variety of computer applications and operating systems so that they can produce timely and accurate information. Elective courses give an opportunity to develop further skills in computer programming, data management, networking, Web development, and information systems security. It 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 Operator, End-user Consultant, Programmer, Microcomputer Applications Specialist, Network Administrator, Technical Writer, Web Master, Web Developer, and Web Site Designer.

## 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 a computer program 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 342 Structured Programming with FORTRAN (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 Design (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; MATH 120, 400, 401; MGMT 306, STAT 300.

**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.

## Database Management

**Certificate of Achievement**

**Program Information**

Database administrators need to manipulate existing or new databases such as inventories, lists, directories, etc. for the corporate world. With the explosion of technology, other computer-related positions are now requiring skills in one or more database packages. This certificate provides the basic knowledge and skills needed for positions in database administration and support.

**Career Opportunities**

Database skills are in high demand by nearly every organization and company. Employment opportunities include database support assistant, administrative assistant, customer or client service representatives, data entry clerk, Web developer, database manager, database administrator, and database developer.

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

- demonstrate working knowledge of relational database technologies for desktop, enterprise, and Internet platforms.
- demonstrate working knowledge of database theory and principles.
- assess and document information system requirements.
- employ modular programming concepts in program development.
- design and code elementary programs encountered in business and government.
- identify interactive web publishing situations requiring database solutions.
- create interactive web database applications.

Required Program	Units
CISA 310 Introduction to Electronic Spreadsheets.....	1
CISA 323 Database Management using Microsoft Access .....	2
CISA 324 Database Management using SQL.....	2
CISC 320 Operating Systems (1) or CISC 323 Linux Operating System (1).....	1
CISP 301 Algorithm Design and Implementation.....	4
CISP 350 Database Programming.....	3
CISP 370 Beginning Visual Basic.....	4
CISW 320 Introduction to Web Site Development.....	3
CISW 410 Middleware Web Scripting (4) or CISW 420 Server-side Web Scripting (4).....	4
<b>Total Units Required</b>	<b>24</b>

### 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

Programmer, Programmer-Analyst, Software Designer, Systems Analyst, Database Administrator, and Software Tester.

#### 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) or ENGWR 300 College Composition (3) or ENGWR 100 College Writing (3).....	3
CISP 301 Algorithm Design and Implementation.....	4
CISP 360 Introduction to Structured Programming.....	4
CISP 400 Object Oriented Programming with C++ (4) or CISP 401 Object Oriented Programming with Java (4).....	4
CISP 430 Data Structures.....	4
CISP 457 Computer Systems Analysis and Design.....	3
<b>Total Units Required</b>	<b>22</b>

### 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: health information technician, customer or client service representatives, and customer support specialists. Based on recent Bureau of Labor Statistics (2002-2012) figures, job demands in these areas will grow from a low of 24% to a high of 47%, and will continue to exceed the number of available and trained workers.

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

- develop the creativity, critical thinking, ethical behavior, and self-understanding that are essential to the attainment of personal goals.
- develop an appreciation for the individual, society, and human heritage and be aware of the impact of their work on society and the environment.
- communicate effectively through speaking, writing, and the use of professional tools.
- recognize and appreciate the need for and pursue life-long learning and continual professional development.
- develop an integrated overview of the diverse field of human knowledge in natural science, social science, humanities, language and rationality, and living skills.
- demonstrate an understanding of professional ethics and responsibilities, and the impact of the professional on society.
- demonstrate an understanding of global, ethical, and societal concerns relating to the impact of computers.
- adapt to technological changes and innovations in computers and use the techniques, skills, and tools necessary to meet needs.
- analyze needs, design solutions, and implement necessary microcomputer applications or processes to on-the-job problems in a team environment using appropriate diagnostic tools.

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>	
CISA 310 Introduction to Electronic Spreadsheets..... 1	
CISA 311 Intermediate Electronic Spreadsheets ..... 1	
CISC 320 Operating Systems ..... 1 <sup>5</sup>	
CISA 340 Presentation Graphics..... 2	
CISC 305 Introduction to the Internet..... 1	
CISC 110 Using ePortfolios ..... 1	
CISA 323 Database Management using Microsoft Access ..... 2	
ET 145 Basic Computer System Repair I (1) 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)..... 4-7	
<b>Total Units Required</b>	<b>20 - 27</b>

<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 of Achievement 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 microcomputer problems.

Such positions include: first line supervisors, administrative analysts, information resource personnel, or lead administrative specialists. Based on recent Bureau of Labor Statistics (2002-2012) figures, job demands in these areas will grow approximately 6.6% and will continue to exceed the number of available and trained workers.

### 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 strategy or techniques using various diagnostic tools.
- analyze on-the-job needs, identify software and hardware related problems, and effectively communicate solutions to end users.

**Enrollment Limitation:** Required Certificate Information Processing Technician. (Courses required for the Word Processing Technician Certificate are included in the following list of required courses for this certificate.)

### Required Courses

Required Courses	Units
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	
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) 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)..... 4-7	
<b>Total Units Required</b>	<b>20-27</b>

<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

Certificate of Completion

## Program Information

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

This certificate is designed for students interested in job advancement requiring additional computer skills.

## Career Opportunities

Students who are currently employed in entry-level office-related jobs (many of which use word processing skills) are interested in opportunities for advancement. These positions usually require competencies in additional microcomputer applications courses in the Windows operating system, spreadsheet, database management, graphic presentations, and the use of the Internet.

Such positions include: health information technician, customer or client service representatives, and customer support specialists. Based on recent Bureau of Labor Statistics (2002-2012) figures, job demands in these areas will grow from a low of 24% to a high of 47%, and will continue to exceed the number of available and trained workers.

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

- demonstrate proficiency in Windows operating system commands, programs, file and folders management, storage, and utilities.
- identify on-the-job problems, projects, presentations, and assignments and design appropriate software solutions or tools.
- evaluate effectiveness of software solutions and implement suitable software changes, enhancements, or improvements.
- design and implement data management systems involving queries, data entry, screen, forms, tables, reports, and labels.
- explain and use asynchronous and synchronous communication tools.
- identify Internet laws, guidelines, security and privacy issues and determine specific on-the-job applications.

**Enrollment Limitation:** Required Certificate Information Processing Technician. (Courses required for the Word Processing Technician Certificate are included in the following list of required courses for this certificate.)

## Required Courses

## Units

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
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
<b>Total Units Required</b>	<b>17 - 19</b>

- <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 Completion, Level 2 or Level 3

This word processing certificate introduces students to microcomputer concepts and skills in two major 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 also 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.

## 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 explosion and integration of technology in the work place, the demand for employees competent in manipulating text has evolved over to other computer-related office positions. Such positions include office assistants and clerks, information and records clerks, and correspondence clerks. Based on recent Bureau of Labor Statistics (2002-2012) figures, job demands in these areas will grow an average of 7% annually and will continue to exceed the number of available and trained workers.

Additionally, areas such as web site design, accounting or book-keeping, 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 Window operating system terminology and commands, file management and storage, and data input.
- 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 use of 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).

Required Courses	Units
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
<b>Total Units Required</b>	<b>10-12 Units</b>

<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 Completion

The Certificate of Completion may be obtained by completion of the required courses 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

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

Required Program for the Degree	Units
CISC 320 Operating Systems (1).....	1
or CISC 323 Linux Operating System (1)	
CISN 300 Network Systems Administration (3).....	3
or CISN 303 Network Administration - Linux Server (3)	
CISN 302 Intermediate Network Systems Administration .....	3
CISN 306 Advanced Network Systems Administration (3).....	3
or CISN 307 Windows Active Directory Services (3)	
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).....	3
or CISS 342 Implementing Linux Operating System Security (3)	
CISS 350 Disaster Recovery.....	3
CISS 360 Computer Forensics and Investigation .....	3
A minimum of 3 units from the following:.....	3
CISC 310 Introduction to Computer Information Science (3)	
CISC 355 Introduction to Data Communications (1.5)	
CISC 351 Introduction to Local Area Networks (1)	
CISC 360 Microcomputer Support and Maintenance (4)	
CISN 306 Advanced Network Systems Administration (3)	
CISN 308 Internetworking with TCP/IP (3)	
CISN 322 Designing a Secure Windows Network (3)	
CISN 374 Messaging Server Administration (3)	
CISN 378 Database Administration for Microsoft SQL Server (3)	
CISN 324 Designing Windows Networking Services (3)	
CISN 340 CISCO Networking Academy (CCNA)Tm: Data Communication and Networking Fundamentals (3)	
CISN 370 Web Server Administration (3)	
CISC 324 Intermediate Linux Operating System (1)	
CISS 300 Introduction to Information Systems Security (1)	
CISS 301 Ethical Hacking (2)	
CISN 315 Advanced Network Administration (2)	
<b>Total Units Required</b>	<b>31</b>

#### Suggested Electives

BUS 310, ENGWR 300, 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**

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

**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 for the Certificate of Achievement      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 Counter Measures..... 3	3
CISS 330 Implementing Internet Security and Firewalls..... 3	3
CISS 341 Implementing Windows Operating System Security (3)..... 3 or CISS 342 Implementing Linux Operating System Security (3)	3

A minimum of 6 units from the following: ..... 6  
 CISN 322 Designing a Secure Windows Network (3)  
 CISS 360 Computer Forensics and Investigation (3)  
 CISS 350 Disaster Recovery (3)  
 CISS 355 Information Systems Security and Assurance Principles (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 Career Certificate recognize the basic skills needed in the networking environment. Focus is on the knowledge and skills required for day-to-day operation and management of computer networks. The Network Administration Degree and Career Certificate prepare students for entry-level positions in computer network administration.

**Career Opportunities**

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

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

- 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 or CISN 303 Network Administration - Linux Server (3) or CISN 304 Networking Technologies (3)	3
CISN 302 Intermediate Network Systems Administration ..... 3	3
CISN 306 Advanced Network Systems Administration (3)..... 3 or 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

A minimum of 13 units from the following: ..... 13  
 CISC 310 Introduction to Computer Information Science (3)  
 CISC 324 Intermediate Linux Operating System (1)  
 CISC 351 Introduction to Local Area Networks (1)  
 CISC 355 Introduction to Data Communications (1.5)  
 CISN 340 CISCO Networking Academy (CCNA)Tm: Data Communication and Networking Fundamentals (3)  
 CISN 341 CISCO Networking Academy (CCNA)Tm: 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 305 Managing a Windows Network Environment (3)  
 CISN 315 Advanced Network Administration (2)  
 CISN 320 Designing Windows Directory Services (3)  
 CISN 322 Designing a Secure Windows Network (3)  
 CISN 324 Designing Windows Networking Services (3)  
 CISN 370 Web Server Administration (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)

**Total Units Required      27**

**Suggested Electives**

BUS 310, ENGWR 300, 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.

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

**Career Opportunities**

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

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

- develop best practices for configuring IP addresses.
- evaluate and implement technologies to support IP routing protocols such as RIP, IGRP, and OSPF.
- construct and configure access lists.
- compare and contrast types of network media.
- demonstrate working knowledge of principles in computer networking and data management, or information systems security, or web server administration, depending on the electives chosen.
- demonstrate competency in Windows operating system terminology and commands, account management, and file management and storage.

**Required Program**

**Units**

CISC 320 Operating Systems (1).....	1
or CISC 323 Linux Operating System (1)	
CISN 340 CISCO Networking Academy (CCNA)Tm: Data Communication and Networking Fundamentals.....	3
CISN 341 CISCO Networking Academy (CCNA)Tm: Networking Theory and Routing Technologies.....	3
CISN 342 CISCO Networking Academy (CCNA)Tm: Advanced Routing and Switching.....	3
CISN 343 CISCO Networking Academy (CCNA)Tm: Wide Area Network and Project-Based Learning.....	3
CISN 346 Network Design and Projects (3.5).....	3-3.5
or CISN 336 Wireless Technologies (3)	
CISN 308 Internetworking with TCP/IP .....	3
CISN 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 324 Designing Windows Networking Services (3)	
<b>Total Units Required</b>	<b>28-28.5</b>

**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**

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

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

- develop best practices for configuring 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)Tm: Advanced Router Configuration.....	3
CISN 351 CISCO Networking Academy (CCNP)Tm: Remote Access.....	3
CISN 352 CISCO Networking Academy (CCNP)Tm: Multi-Layer Switching.....	3
CISN 353 CISCO Networking Academy (CCNP)Tm: Internetwork Troubleshooting.....	3
<b>Total Units Required</b>	<b>12</b>

**Certificate of Achievement**

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

**Microcomputer Technician**

**Associate in Science Degree  
Certificate of Achievement**

**Recommended High School Preparation**

Courses in electricity, electronics, English, algebra, physics, chemistry and computers.

**Program Costs**

In addition to the normal student expenses (for textbooks, personal equipment and supplies), laboratory materials fees may be required. Students will be responsible for providing some of their own parts and a basic Electronics tool kit. These will be available as ready-made sets in the College Store. For specific class required materials and texts, check with the Electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

### Career Opportunities

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

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

- use the operating system on a personal computer to manipulate files and folders.
- use the operating system on a personal computer to configure hardware and applications.
- explain common computer terminology used in computer information science and electronics technology.
- diagnose common computer errors that occur because of hardware, software, or network problems.
- predict common computer error solutions in hardware, software, or network systems.
- resolve common computer errors that occur in hardware, software, or network systems.

#### Required Program

	Units
CISC 310 Introduction to Computer Information Science .....	3
CISP 301 Algorithm Design and Implementation.....	4
CISP 363 Structured Programming with BASIC.....	2
CISC 320 Operating Systems (1).....	1
or CISC 323 Linux Operating System (1)	
CISA 310 Introduction to Electronic Spreadsheets.....	1
CISA 311 Intermediate Electronic Spreadsheets .....	1
CISA 323 Database Management using Microsoft Access .....	2
ET 145 Basic Computer System Repair I (1).....	4
and ET 146 Basic Computer System Repair II (3) or CISC 360 Microcomputer Support and Maintenance (4)	
ET 340 Basic Microprocessors.....	5
ET 390 Microprocessor Systems - Troubleshooting .....	3
ET 490 Advanced Student Projects Laboratory .....	2
CISC 355 Introduction to Data Communications (1.5).....	1.5-3
or CISN 300 Network Systems Administration (3) or CISN 303 Network Administration - Linux Server (3)	
A minimum of 4 units from the following:.....	4
ET 300 DC Theory and Circuit Fundamentals (2.5) and ET 301 AC Theory and Circuit Fundamentals (2.5)	
ET 306 Electronics Fabrication and Soldering Techniques (2)	
ET 310 Mathematics for DC Circuit Fundamentals, Part I (1.5) and ET 311 Mathematics for AC Circuit Fundamentals, Part II (1.5)	
ET 320 Semiconductor Theory (5)	
EDT 310 Computer Aided Drafting (3)	
EDT 352 Electrical and Electronics Drafting Design (4)	
CISN 300 Network Systems Administration (3)	
CISC 351 Introduction to Local Area Networks (1)	
CISN 303 Network Administration - Linux Server (3)	
CISN 304 Networking Technologies (3)	

#### Total Units Required

**33.5 - 35**

### 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.

## 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 receiving 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.

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

- compose clear, grammatically-correct documents related to business using word processing software.
- 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.
- prepare 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.

#### Required Program

	Units
BUS 310 Business Communications (3).....	3 - 4
or ENGWR 300 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
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)	
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)]	

#### Total Units Required

**20.5-23.5**

### 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. The certificate was previously called Web Programming.

## Career Opportunities

Web Developer, Web Site Specialist, Webmaster, Systems Analyst, Web Systems Analyst, IT Analyst, Web Database Administrator, Back-end Developer.

## 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 the current version of HTML, 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, and 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, and presentation.
- design, implement, manage, and evaluate data management systems involving custom programming to solve complex business problems.

## Required Courses

## Units

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
CISP 401 Object Oriented Programming with Java.....	4
CISP 350 Database Programming.....	3
CISW 325 Intermediate Web Site Development.....	4 <sup>2</sup>
CISW 370 Designing Accessible Web Sites.....	1
CISW 400 Client-side Web Scripting.....	4
CISW 410 Middleware Web Scripting (4).....	4
or CISW 420 Server-side Web Scripting (4)	
CISW 440 XML: Introduction to Extensible Markup Language.....	2
CISW 470 Web Projects.....	3

## Total Units Required

32

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

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

## 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

Webmaster, Web Developer, IT Specialist, IT Developer, Technology Specialist, Web 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.
- 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, and 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.

Required Program	Units
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 Completion

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

## International Computer Driving License

### Certificate of Completion, Level 2

#### Program Information

Designed for students in any field who want to pass all seven examinations that are part of the International Computer Driving License (ICDL). These courses prepare students by teaching them the terminology used in the world of computers and the World Wide Web. Then it teaches students 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

Office Worker, Administrative Assistant, Business Office Employee, Information Technician, Insurance Agent, Retail Clerk, Office Clerk

#### 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 323 Database Management using .....	2
Microsoft Access	
CISA 340 Presentation Graphics.....	2
CISC 305 Introduction to the Internet.....	1
<b>Total Units Required</b>	<b>11</b>

### Certificate of Completion

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

## Webmaster, Level 1

### 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 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 development team.

#### Career Opportunities

Webmaster, Web Team Member, Information System Analyst, Information Technology Analyst, 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.
- create 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 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 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.

**Required Program**

**Units**

CISC 305 Introduction to the Internet (1) or CISC 355 Introduction to Data Communications (1.5).....	1-1.5
CISC 320 Operating Systems (1) or CISC 323 Linux Operating System (1) or GCOM 101 Introduction to the Macintosh (1.5).....	1-1.5
MKT 330 Internet Marketing .....	3
CISW 320 Introduction to Web Site Development.....	3 <sup>1</sup>
CISW 350 Imaging for the Web (1) or GCOM 360 Graphics for the Web (3) .....	1-3
GCOM 361 Creative Web Page Design .....	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) or CISW 400 Client-side Web Scripting (4) .....	4 <sup>2</sup>
CISW 470 Web Projects (3) or GCOM 370 Web Projects (3).....	3
<b>Total Units Required</b>	<b>25-28</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 entry-level employment as a Webmaster or Web server administrator.

**Career Opportunities**

Webmaster, Web Team Member, Information System Analyst, Information Technology Analyst, 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, and 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**

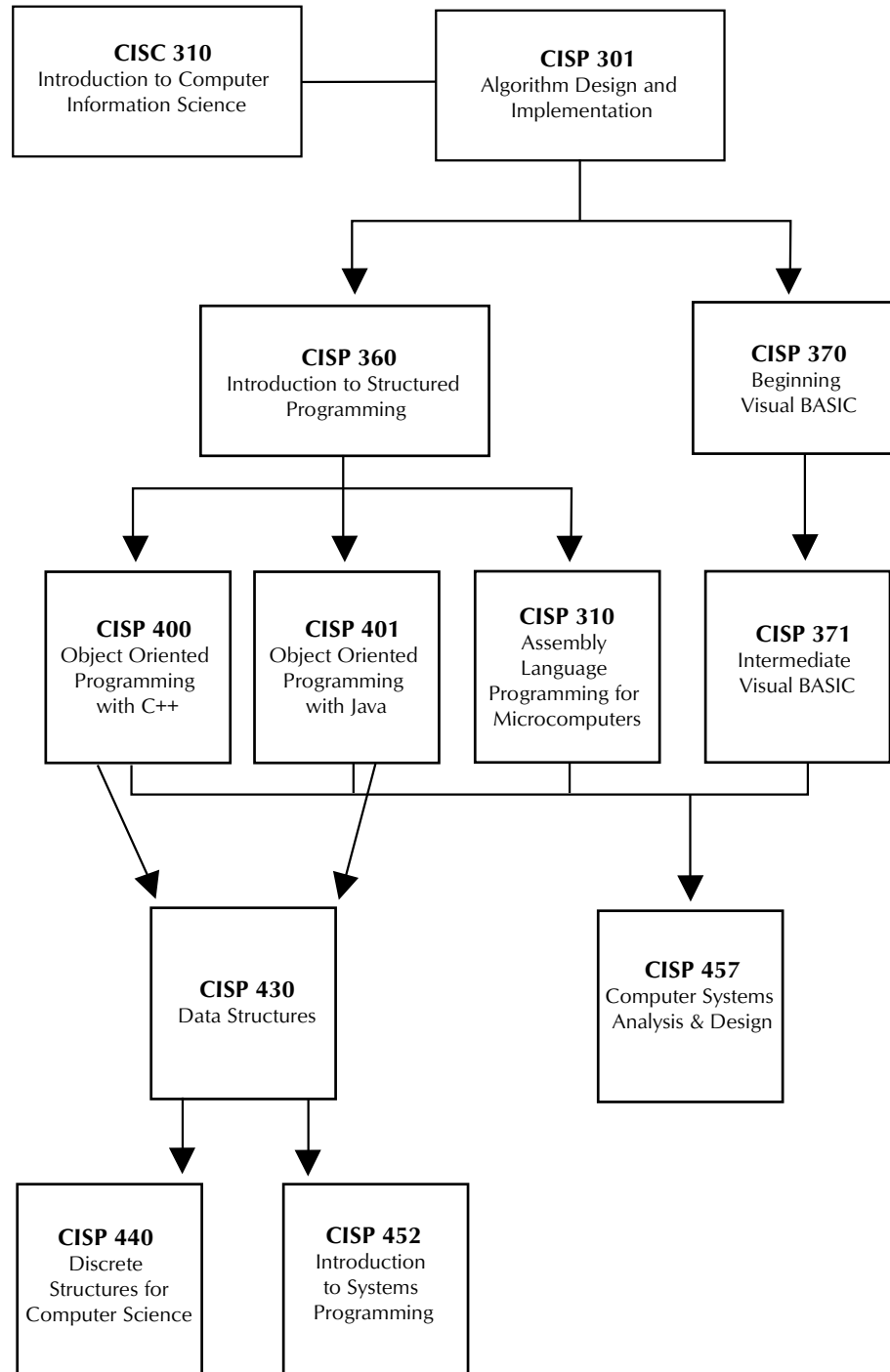
CISC 320 Operating Systems (1).....	1-1.5
or GCOM 101 Introduction to the Macintosh (1.5)	
CISC 323 Linux Operating System .....	1
CISC 355 Introduction to Data Communications.....	1.5
CISW 320 Introduction to Web Site Development (3).....	3
or CISW 321 Web Site Development using Dreamweaver (3)	
CISN 300 Network Systems Administration (3).....	3
or CISN 303 Network Administration - Linux Server (3)	
CISW 325 Intermediate Web Site Development (4).....	4
or CISW 410 Middleware Web Scripting (4) or CISW 420 Server-side Web Scripting (4)	
CISS 310 Network Security Fundamentals.....	3
CISN 308 Internetworking with TCP/IP .....	3
CISS 330 Implementing Internet Security and Firewalls.....	3
CISN 370 Web Server Administration .....	3
<b>Total Units Required</b>	<b>25.5-26</b>

**Certificate of Achievement**

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

# Computer Information Science

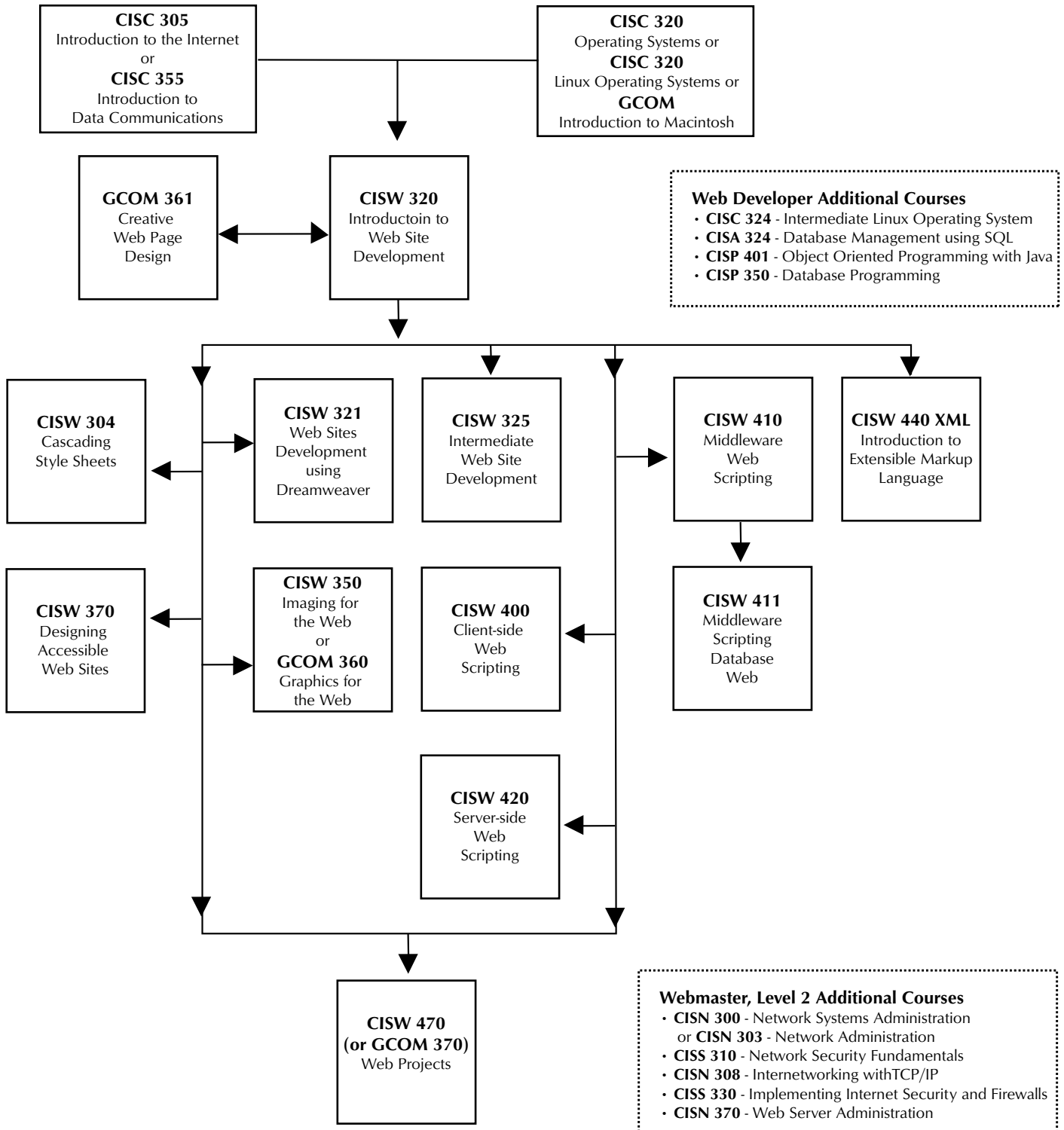
## Sequence of Modern Programming Language Courses



- 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 Communications. 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:* Completion of 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 two times for credit on a different software package or operating system.

### 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, then covers intermediate software features such as document processing functions, macro programming functions, complex document styles and commands, and table and graphics application. The course incorporates all word processing features into the production of one final presentation/job portfolio. The course may be taken two times for credit on a different software package or operating system.

### 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 the student to word processing and presentation software. The basic features and skills of creating, editing, formatting, inserting tables and graphics, 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:* Completion of CISC 300 or CISC 310 and BUSTEC 100.1 or BUSTEC 300.1 with a grade of "C" or better or touch-typing at 28 wpm. Touch-typing skill will make spreadsheet preparation easier.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course introduces the student to 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 three times for credit on a different software package or operating system.

### CISA 311 Intermediate Electronic Spreadsheets 1 Unit

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

*Advisory:* Completion of CISC 300 or CISC 310 and BUSTEC 100.1 or BUSTEC 300.1 with a grade of "C" or better or touch-typing at 28 wpm. Touch-typing skill will make spreadsheet preparation easier.

*Course Transferable to CSU*

*Hours:* 18 hours LEC; 18 hours LAB

This course will extend the capabilities of students who have started to use electronic spreadsheet software. Topics and laboratory assignments will include using multiple worksheets and workbooks, web tools, scenario management, solver, imported data, the lookup function, and macros. The course may be taken three times for credit on a different software package or operating system.

### 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 with the same version of software may not receive credit for this course. This course may be taken three times for credit with a different version of the software.

### 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: Completion of 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. Students will learn how to edit and format presentations, animation, organizational charts, and clips (graphics, sounds, or video). 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 class will include both lecture and hands-on experience.

**CISA 495 Independent Studies: 1-3 Units**  
**Computer Information Science Applications**

*Prerequisite: None*  
*Course Transferable to CSU*  
*Hours: 54 hours LAB*  
 See Independent Studies

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

*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 beginning computer student, through hands-on operation, to the features of the microcomputer. 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 designated 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 include 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 1-3 Units**  
**Computer Information Science-Core**

*Prerequisite: None*  
*Hours: 54 hours LEC*  
 See Independent Studies

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

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

**CISC 300 Computer Familiarization 1 Unit**

*Prerequisite: None.*  
*Advisory: Completion of BUSTEC 300.1 or BUSTEC 100.1 with a grade of "C" or better or touch typing at 28 wpm.*  
*General Education: AA/AS Area II(b)*  
*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 will emphasize microcomputers, how they work, how they can be used, and the terminology of the computer world. Microcomputer applications using the Windows environment will be presented, and hands-on laboratory assignments will be given. 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 wishing 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, 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, 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:* Completion of 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 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

The 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 system. 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 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 students to the microcomputer operating system. The student will become familiar with basic features, file and program management, disk management commands, and menus. This course may be taken three times for credit for different operating systems.

**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 the study of 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 three times using different operating systems or versions.

**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 kernels, file structures, daemons, shells, GUIs, procedures for installing software, creation of user accounts, shell commands, scripts, and file security.

**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. It covers advanced shell scripting. C Shell, K Shell, BASH, and other varieties will be compared. It also includes decision-making logic, looping, nesting, and other scripting tools will be used.

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

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

*Advisory:* Completion of CISC 320 with a grade 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. Lab activities will be completed using local area network.

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

*Prerequisite:* None

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

*Course Transferable to CSU*

*Hours:* 27 hours LEC

This course will introduce business data communications. Students will learn about media, telecommunications, protocols, interfaces, and packet switching. Independent assignments will include research using the Internet for locating, viewing, printing, and downloading information.

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

*Prerequisite:* CISC 300 or CISC 310 and 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 CSU*  
*Hours: 54 hours LAB*  
 See Independent Studies

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

*Prerequisite: None*  
*Course Transferable to CSU*  
*Hours: 72 hours LEC*  
 See Work Experience

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

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

**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 Offering

**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 when recertification is required.

**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 covers advanced system 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 when recertification is required.

**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 introductory coverage of Linux Network Administration. Topics covered include connecting to a network; utilizing network file 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.

**CISN 304 Networking Technologies 3 Units**

*Prerequisite: CISC 310, 320, and 355 with grades 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 when recertification is required.

### CISN 305    **Managing a Windows Network Environment**    **3 Units**

*Prerequisite: Successful completion of CISN 302 with a grade of "C" or better.*

*Course Transferable to CSU*

*Hours: 45 hours LEC; 27 hours LAB*

This course provides students with knowledge and skills necessary to administer, manage, support, and troubleshoot information systems that incorporate medium to large Windows networks. The student will learn to create, configure, and manage file, print, and web resources; manage data storage; create shared resources and configure access rights; monitor and manage network security; configure and troubleshoot TCP/IP on servers and client computers; monitor and troubleshoot server health and performance; deploy software by using Group Policy; and implement and troubleshoot Terminal Services.

### 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 when recertification is required.

### 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 when recertification is required.

### 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 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, when recertification is required.

### 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 twice for credit on a different operating system.

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

*Prerequisite: CISN 306 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 skills necessary to design a Microsoft Windows directory services infrastructure in an enterprise network. Topics include: implementing group policies, Windows Internet Naming System (WINS), Domain Name Systems (DNS), Dynamic Host Configuration Protocol (DHCP), Routing and Remote Access (RRAS) and server placement in a network infrastructure. Also included are the design of an Active Directory structure for an enterprise; the development a plan to secure and delegate administrative authority over Active Directory; the design of a site topology for a multi-domain organization; and the design of an Active Directory replication plan based on the site topology design.

### CISN 322    **Designing a Secure Windows Network**    **3 Units**

*Prerequisite: CISN 306 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 skills necessary to design a security framework for small, medium, and enterprise networks using Microsoft Windows technologies. Emphasis is on secure access to local network users, to remote users and remote offices, and between private and public networks. Topics include: group policy, site topology, Virtual Private Networks (VPNs), e-commerce, printer security, and security for non-Microsoft clients.

**CISN 324    Designing Windows                    3 Units**  
**Networking Services**

*Prerequisite:* CISN 308 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 skills necessary to create a networking services infrastructure design that supports the required network applications. Each module provides a solution based on the needs of the organization. The course includes designing and planning for Dynamic Host Configuration Protocol (DHCP), Domain Name Service (DNS) Internet Protocol (IP) address configuration, routing solutions using Open Shortest Path First (OSPF) and Internet Group Management Protocol (IGMP), Internet connectivity design using Network Address Translation, Internet connectivity using Microsoft Proxy Server 3.0, remote access connectivity; and a management strategy for networking services.

**CISN 336    Wireless Technologies                    3 Units**

*Prerequisite:* CISN 141 or 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 introductory course to 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 four times for credit for recertification due to industry standards. Formerly CISN 136.

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

*Prerequisite:* None.  
*Advisory:* CISC 320 and one of CISC 300 or CISC 310 with grades of "C" or better.  
*General Education:* AA/AS Area II(b)  
*Course Transferable to CSU*  
*Hours:* 54 hours LEC; 18 hours LAB  
 This course is designed to introduce students to data communication and networking fundamentals. The course 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 four times for credit for recertification due to industry standards. Formerly CISN 140.

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

*Prerequisite:* CISN 140 or 340 with a grade of "C" or better  
*General Education:* AA/AS Area II(b)  
*Course Transferable to CSU*  
*Hours:* 54 hours LEC; 18 hours LAB  
 This course provides an introduction to 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. SCC is a certified CISCO Networking Academy and all courses are taught by CISCO Certified Academy Instructors (CCAI). This course may be taken four times for credit for recertification due to industry standards. Formerly CISN 141.

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

*Prerequisite:* CISN 141 or 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 four times for credit for recertification due to industry standards. Formerly CISN 142.

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

*Prerequisite:* CISN 142 or 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 four times for credit for recertification due to industry standards. Formerly CISN 143.

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

*Prerequisite:* CISN 141 or 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 four times for credit for recertification due to industry standards. Formerly CISN 146.

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

*Prerequisite: CISN 143 with a grade of "C" or better; or 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 four times for credit for recertification due to industry standards. Formerly CISN 150.

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

*Prerequisite: CISN 143 with a grade of "C" or better; or 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 four times for credit for recertification due to industry standards. Formerly CISN 151.

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

*Prerequisite: CISN 143 with a grade of "C" or better; or 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 four times for credit for recertification due to industry standards. Formerly CISN 152.

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

*Prerequisite: CISN 143 with a grade of "C" or better; or 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 four times for credit for recertification due to industry standards. Formerly CISN 153.

**CISN 370 Web Server Administration 3 Units**

*Prerequisite: CISN 300 or 303 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 covers Web server installation and administration for the Internet and Intranets. Topics include the installation, configuration, management and tuning of Web servers; WWW and FTP services; security features; on-line transaction processing; and Web site optimization.

**CISN 374 Messaging Server 3 Units**  
**Administration**

*Prerequisite: CISN 102 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 3 Units**  
**Microsoft SQL Server**

*Prerequisite: CISN 302 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 .5-4 Units  
Computer Information Science-  
Network**

*Prerequisite: None*  
*Course Transferable to CSU*  
*Hours: 72 hours LEC*  
See Experimental Offering

## Computer Info Science - Programming (CISP)

**CISP 301 Algorithm Design and 4 Units  
Implementation**

*Prerequisite: None.*  
*Advisory: CISC 310; At least one year of high school algebra or  
MATH 100*

*General Education: AA/AS Area II(b)*  
*Course Transferable to CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

This course provides an introduction to the analysis, design, and implementation of software solutions to business-related problems. An overview of the following topics will also be included: main and cache memory, data representation, two's-complement addition and subtraction, instruction processing by the central processing unit, computer programming languages, and the software development process.

**CISP 310 Assembly Language 4 Units  
Programming for Microcomputers**

*Prerequisite: CISP 301 and 360 with grades of "C" or better*  
*General Education: AA/AS Area II(b)*

*Course Transferable to UC/CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

This is an introductory course in assembly language for the Intel family of microprocessors. Students will write and debug programs that use control structures, subprocedures, bit operations, interrupts, arrays, and recursion. Upon completion of the course, students will have a much better understanding of the internal operations of computers.

**CISP 320 COBOL Programming 4 Units**

*Prerequisite: CISP 301 with a grade of "C" or better.*

*Course Transferable to CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to the COBOL programming language. Course elements include top-down design and structured programming methods. Laboratory assignments cover a variety of input/output techniques including data validation, arithmetic operations, output editing, array processing, control-break concepts, and the creation and update of sequential files.

**CISP 342 Structured Programming 4 Units  
with FORTRAN**

*Prerequisite: CISP 301 with a grade of "C" or better*  
*Advisory: MATH 120 with a grade of "C" or better.*  
*General Education: AA/AS Area II(b)*

*Course Transferable to UC/CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

FORTRAN (formula translation) is an automatic coding system that allows the engineer, scientist or technician to utilize a computer for problem solving. Structured programming will be emphasized, dividing big jobs into smaller tasks to make them easier to solve. The student will design, code, test, and debug many FORTRAN programs.

**CISP 350 Database Programming 3 Units**

*Prerequisite: CISA 323 with a grade of "C" or better*  
*Advisory: proficiency in any high-level programming language*  
*General Education: AA/AS Area II(b)*

*Course Transferable to CSU*  
*Hours: 36 hours LEC; 54 hours LAB*

This is an introductory course to programming in database. The topics include analysis and design, modular programming, screen displays and menus, and multiple databases. This course may be taken three times for credit on a different software package or version.

**CISP 360 Introduction to Structured 4 Units  
Programming**

*Prerequisite: CISP 301 with a grade of "C" or better*  
*General Education: AA/AS Area II(b)*

*Course Transferable to UC/CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to structured programming and objects. Topics include program design, use of variables and constants, operators, control structures, functions, standard libraries, pointers, arrays, and input/output (including file I/O).

**CISP 363 Structured Programming 2 Units  
with BASIC**

*Prerequisite: CISP 301 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 is an introduction to structured programming with Beginner's All-purpose Symbolic Instruction Code (BASIC). Topics include program design, use of variables, flow control, constants, libraries, arrays, functions, arguments, and input/output.

**CISP 370 Beginning Visual Basic 4 Units**

*Prerequisite: CISP 301 with a grade of "C" or better*  
*General Education: AA/AS Area II(b)*

*Course Transferable to UC/CSU*  
*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to object oriented/event driven programming in a Windows environment. Topics include buttons, boxes, graphics, data handling, error handling, control, and form handling. This course will enable students to understand object oriented programming concepts such as form, methods, projects, and modules and to design useful Windows layouts.

**CISP 371 Intermediate Visual Basic 4 Units**

*Prerequisite: CISP 370 with a grade of "C" or better*

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

*Course Transferable to UC/CSU*

*Hours: 54 hours LEC; 54 hours LAB*

This course covers the study of intermediate and advanced object oriented programming using Visual BASIC. The student will learn about multiple document interface (MDI), advanced error handling, creating classes, collections and client-server architecture. Topics include: data access, application programming interface (API), and application configuration management.

**CISP 400 Object Oriented Programming with C++ 4 Units**

*Prerequisite: CISP 360 with a grade of "C" or better.*

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

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

*Course Transferable to UC/CSU*

*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to object oriented programming using C++. Topics include differences between C and C++ including declarations, constants, operators, function calling by value and reference, strict type checking; function members and overloading; inheritance and multiple inheritance; derived classes, protected members, and virtual functions.

**CISP 401 Object Oriented Programming with Java 4 Units**

*Prerequisite: CISP 360 with a grade of "C" or better*

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

*Course Transferable to UC/CSU*

*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to Object Oriented Programming using the Java language. The student will learn how to design and implement object oriented applications. Topics will include: objects, classes, UML, function overloading, inheritance, static and dynamic class relationships, polymorphism, components, event driven programming, class associations, testing and debugging.

**CISP 430 Data Structures 4 Units**

*Prerequisite: CISP 400 or 401 with a grade of "C" or better*

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

*Course Transferable to UC/CSU*

*Hours: 54 hours LEC; 54 hours LAB*

This course is an introduction to the design and implementation of complex data structures used in large computer applications. List, stack, queue and tree data structures are implemented using pointers and recursion. Topics include software requirements specification, algorithm analysis, debugging and testing, searching and sorting techniques, and object oriented programming methodology.

**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*

*Advisory: C structured programming language experience*

*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 Design 3 Units**

*Prerequisite: CISP 301 with a grade of "C" or better; and any one of the following: CISP 320, CISP 321, CISP 342, CISP 360, CISP 370, CISP 371, CISP 400, or CISP 401 with grade of "C" or better.*

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

*Course Transferable to CSU*

*Hours: 54 hours LEC; 18 hours LAB*

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 system 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 CSU*

*Hours: 90 hours LEC*

See Experimental Offering

## Computer Information Science - Security (CISS)

### CISS 300 Introduction to Information Systems Security 1 Unit

*Prerequisite:* None.

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

*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. Some experience and/or courses in networking is recommended prior to taking this course.

### CISS 301 Ethical Hacking 2 Units

*Prerequisite:* None.

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

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

*Course Transferable to CSU*

*Hours:* 27 hours LEC; 27 hours LAB

This course introduces basic security concepts, principles and "best practices" and explores ways in which security for a stand-alone PC and a network-connected PC can be compromised. It provides 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 countermeasures are discussed.

### CISS 310 Network Security Fundamentals 3 Units

*Prerequisite:* None

*Advisory:* CISN 140 or CISN 300 or CISN 304 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 45 hours LEC; 27 hours LAB

Organizations today are linking their information systems across enterprise-wide networks and Virtual Private Networks, as well as increasing their exposure to the Internet. Each connection magnifies the vulnerability to unauthorized access. 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.

### 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

With the growing reliance on e-commerce, network-based services and the Internet, organizations are faced with an ever-increasing responsibility to protect their systems from attack. Internet Detection Systems (IDS) are the latest and most powerful tools for identifying and responding to network- and host-based intrusions. Students will research network and operating system exploits, and deploy the proper countermeasures. Virtual Private Networks (VPN) are countermeasures which provide a significant cost savings by allowing remote users and multiple sites to securely communicate across a public network. A thorough understanding of the many standards and technologies available is essential for a successful VPN implementation. In this course, students will gain the knowledge required to evaluate, implement and manage secure remote-access technologies.

### 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

With the increased connectivity to the Internet and the wide availability of automated cracking tools, organizations can no longer simply rely on operating system security to protect their valuable corporate data. The firewall has emerged as a primary tool used to prevent unauthorized access. 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 will aid students in preparing for Check Point Security's "Check Point Certified Security Administrator" (CCSA) certification.

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

*Prerequisite:* None.

*Advisory:* CISC 320 and CISS 310; with a grade of "C" or better

*Course Transferable to CSU*

*Hours:* 45 hours LEC; 27 hours LAB

As organizations increasingly come to rely on Windows-based networks, it is essential that system administrators have a complete understanding of the security models integral to Windows Server and Workstation. 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 4 times for recency.

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

*Prerequisite:* None.

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

*Hours:* 45 hours LEC; 27 hours LAB

The Linux family of operating systems is prized by developers and other IT professionals for its flexibility and openness. Vulnerabilities in standard configurations, however, can make Linux systems susceptible to security threats. For the many organizations that depend upon Linux systems, protection against intrusion is an absolute requirement. 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 4 times for recency.

### 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 4 times for recency.

### CISS 355      **Information Systems Security    3 Units and Assurance Principles**

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

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

*Course Transferable to CSU*

*Hours:* 54 hours LEC

This course provides the foundation for understanding the key issues associated with protecting information assets; determining the levels of protection and response to security incidents; and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. The purpose of the course is to provide the student with an overview of the field of Information Systems Security and Assurance. Students will be exposed to a wide-spectrum of Security activities, methods, methodologies, and procedures. Coverage will include inspection and protection of information assets, detection of and reaction to threats to information assets, and examination of pre- and post-incident procedures, technical and managerial responses and an overview of the Information Systems Security Planning and Staffing functions.

### CISS 360      **Computer Forensics and      3 Units Investigation**

*Prerequisite:* None.

*Advisory:* CISC 320 and CISS 310; with a grade 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 covered 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 4 times for recency.

## Computer Info Science - Web (CISW)

### 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      3 Units Development**

*Prerequisite:* CISC 320 or 323 with a grade of "C" or better; or equivalent experience

*Advisory:* CISC 305 or CISC 306 with a grade of "C" or better  
*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, an introduction to scripting, 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. Students who have completed CISW 300 since Fall 2004 may not receive credit for this course.

**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, links, tables, frames, forms, Cascading Style Sheets and image maps, enhancing Web pages with Flash text, Flash buttons and the built-in scripting language, developing effective Web site structures, using Web site management tools, Web site documentation, making global 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 320 with a grade of "C" or better; or the ability to create Websites by hand coding using XHTML and cascading stylesheets.

*Advisory:* CISP 301 with a grade of "C" or better.

*Course Transferable to CSU*

*Hours:* 72 hours LEC

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 hyper-text pre-processor (PHP), CGI scripting with Perl, and database-driven Web development.

**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 is an introduction to 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 Web site 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. 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 Web sites for people with disabilities. Current legal requirements for accessible Web sites, 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

*Advisory:* Completion of CISC 310 and CISP 301 with grades of "C" or better

*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. 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 teaches students 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 and CISP 301 or one programming course 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 Web sites 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 Web sites 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:* Either CISA 320, 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

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 on different versions of XML.

**CISW 470 Web Projects 3 Units**

*Same As:* GCOM 370

*Prerequisite:* Completion of one of the following: CISW 300, CISW 320, CISW 325, CISW 400, 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. 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.) This course may be taken two times with different projects. Credit can be given for either CISW 470 or GCOM 370, but not both.

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

*Prerequisite:* None

*Course Transferable to CSU*

*Hours:* 54 hours LEC

See Experimental Offering