**Computer Science Degree**

This program is a comprehensive exposure to programming languages, algorithms and problem solving in preparation for upper division computer science courses. The Computer Science degree includes substantial course work in mathematics as is required by most university computer science programs.

**Requirements for Degree** 36 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISP 300</td>
<td>Algorithm Design/Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>CISP 310</td>
<td>Assembly Language Programming for Microcomputers</td>
<td>4</td>
</tr>
<tr>
<td>CISP 360</td>
<td>Introduction to Structured Programming</td>
<td>4</td>
</tr>
<tr>
<td>CISP 400</td>
<td>Object Oriented Programming with C++</td>
<td>4</td>
</tr>
<tr>
<td>CISP 430</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CISP 440</td>
<td>Discrete Structures for Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CISP 453</td>
<td>Introduction to Systems Programming in UNIX</td>
<td>4</td>
</tr>
<tr>
<td>MATH 400</td>
<td>Calculus I</td>
<td>5</td>
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<tr>
<td>MATH 401</td>
<td>Calculus II</td>
<td>5</td>
</tr>
</tbody>
</table>

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

**CIS: Computer Networking Management Degree**

The Computer Networking Management degree covers network administration technologies, techniques, and the hardware and software used in today’s business/enterprise networking environment. Major topics covered include installation, configuration, and troubleshooting of network operating systems. The degree stresses the knowledge and skills required for the day-to-day operation, business aspects, security and management of computer networks. This degree has three distinct concentrations with specific courses for each concentration track:

- **Microsoft Windows networking concentration**, focusing on preparing for the Microsoft Certified Systems Engineer (MCSE) and/or the Microsoft Certified Systems Administrator (MCSA) certification.
- **Linux/Unix networking concentration**, focusing on preparing for the administration of commercial Linux/Unix servers and network environments.
- **Cisco router and network administration concentration**, which covers all the objectives of the Cisco Certified Network Associate (CCNA) certification exam.

**Career Opportunities**

The Network Management degree is designed for career/technical students who plan to enter the work force as well as to upgrade the skill set of working IT professionals. The degree and its three concentrations are formulated with advice from business and industry representatives and conform to industry standards. Typical jobs a student could expect to fill would be network technical support representatives, network administrators, network designers, network systems engineer, network troubleshooters, and information systems security specialists.

**Core Requirements for Degree** 25-26 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 101</td>
<td>Fundamentals of College Accounting</td>
<td>3</td>
</tr>
<tr>
<td>or ACCT 301</td>
<td>Financial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>or BUS 300</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 310</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>or ENGR 300</td>
<td>College Composition</td>
<td>3</td>
</tr>
<tr>
<td>CISA 305</td>
<td>Beginning Word Processing</td>
<td>2</td>
</tr>
<tr>
<td>CISA 315</td>
<td>Introduction to Electronic Spreadsheets</td>
<td>2</td>
</tr>
<tr>
<td>CISC 320</td>
<td>Operating Systems</td>
<td>1</td>
</tr>
<tr>
<td>CISC 323</td>
<td>Linux Operating System</td>
<td>1</td>
</tr>
<tr>
<td>CISC 350</td>
<td>Introduction to Data Communications</td>
<td>1</td>
</tr>
<tr>
<td>CISC 361</td>
<td>Microcomputer Support Essentials - Preparation</td>
<td>3</td>
</tr>
<tr>
<td>or CISC 370</td>
<td>for A+ Certification</td>
<td></td>
</tr>
<tr>
<td>CISS 310</td>
<td>Network Security Fundamentals</td>
<td>3</td>
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<tr>
<td>and a minimum of 1 unit from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUSTEC 300</td>
<td>Beginning Keyboard/Applications</td>
<td>1</td>
</tr>
<tr>
<td>and a minimum of 5 units from the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISA 126</td>
<td>Outlook: Basics</td>
<td>1</td>
</tr>
<tr>
<td>or BUSTEC 126</td>
<td>Outlook: Basics</td>
<td>1</td>
</tr>
<tr>
<td>and CISA 127</td>
<td>Outlook: Tools</td>
<td>1</td>
</tr>
<tr>
<td>or BUSTEC 127</td>
<td>Outlook: Tools</td>
<td>1</td>
</tr>
<tr>
<td>and CISA 160</td>
<td>Project Management Techniques and Software</td>
<td>3</td>
</tr>
</tbody>
</table>
CISA 320  Introduction to Database Management (1)
and CISA 321  Intermediate Database Management (1)
CISA 340  Presentation Graphics (2)
CISC 306  Introduction to Web Page Creation (1)
CISC 351  Introduction to Local Area Networks (1)
CISN 190  Client Operating Systems (2)
CISN 314  Fiber Optical Networking (3)
CISN 374  Messaging Server Administration (3)
CISS 300  Introduction to Information Systems Security (1)
CISS 301  Ethical Hacking (2)
CISS 350  Disaster Recovery (3)
CISW 310  Advanced Web Publishing (4)

CIS: Computer Networking Management Certificate

The CIS: Computer Networking Management Certificate provides instruction for entry-level and IT professionals aiming for skill enhancement on the specific knowledge and skills required to master one of three industry standard network technologies:

- Microsoft Windows networking concentration, focusing on preparing for the Microsoft Certified Systems Engineer (MCSE) and/or the Microsoft Certified Systems Administrator (MCSA) certification.
- Linux/Unix networking concentration, focusing on preparing for the administration of commercial Linux/Unix servers and network environments.
- Cisco router and network administration concentration, which covers all the objectives of the Cisco Certified Network Associate (CCNA) certification exam.

Core Requirements for Certificate 8 Units
CISC 323  Linux Operating System ................................. 1
CISC 350  Introduction to Data Communications ............... 1
CISC 361  Microcomputer Support and Repair .................. 3
CISN 310  Network Security Fundamentals ........................ 3

CISCO Concentration 21 Units
Core Requirements .................................................. 25-26
CISC 324  Intermediate Linux Operating System ............... 1
CISN 110  Networking Technologies - Preparation for N+ ........... 2
CISN 111  Intermediate Networking Technologies - Preparation for N+ Certification ................................. 2
CISN 119  TCP/IP Protocols ......................................... 3
CISN 120  Beginning Network Administration with Linux .......... 3
CISN 121  Network Administration with Linux: LAN Services ...... 2
CISN 122  Network Administration with Linux: Internet Services ...... 2
CISN 140  CISCO Networking Academy (CCNA): Data Communication and Networking Fundamentals .............. 3
CISN 141  CISCO Networking Academy (CCNA): Networking Theory and Routing Technologies .............................. 3
CISN 142  CISCO Networking Academy (CCNA): Advanced Routing and Switching ............................ 3
CISN 143  CISCO Networking Academy (CCNA): Wide Area Network and Project-Based Learning .................. 3

And a minimum of 3 units from the following: .. 3
CISA 405  Scripting for Applications (3)
CISN 325  Network Security and Firewalls (3)

LINUX Concentration 23 Units
Core Requirements .................................................. 25-26
CISC 324  Intermediate Linux Operating System ............... 1
CISN 110  Networking Technologies - Preparation for N+ ........... 2
CISN 111  Intermediate Networking Technologies - Preparation for N+ Certification ................................. 2
CISN 119  TCP/IP Protocols ......................................... 3
CISN 120  Beginning Network Administration with Linux .......... 3
CISN 121  Network Administration with Linux: LAN Services ...... 2
CISN 122  Network Administration with Linux: Internet Services ...... 2
CISCO Networking Academy (CCNA): Data Communication and Networking Fundamentals .............. 3
CISCO Networking Academy (CCNA): Networking Theory and Routing Technologies .............................. 3
CISCO Networking Academy (CCNA): Advanced Routing and Switching ............................ 3
CISCO Networking Academy (CCNA): Wide Area Network and Project-Based Learning .................. 3

And a minimum of 3 units from the following: .. 3
CISP 400  Object Oriented Programming with C++ (4)
CISP 453  Introduction to Systems Programming in UNIX (4)
CISU 342  Implementing Linux Operating System Security (3)

WINDOWS Concentration 24 Units
Core Requirements .................................................. 25-26
CISN 110  Networking Technologies - Preparation for N+ ........... 2
CISN 111  Intermediate Networking Technologies - Preparation for N+ Certification ................................. 2
CISN 300  Network Systems Administration ........................ 3
CISN 302  Intermediate Network Systems Administration .......... 3
CISN 307  Windows Active Directory Services .................... 3
CISN 308  Internetworking with TCP/IP (3) ......................... 3
CISCO Networking Academy (CCNA): Data Communication and Networking Fundamentals .............. 3
CISCO Networking Academy (CCNA): Networking Theory and Routing Technologies .............................. 3
CISCO Networking Academy (CCNA): Advanced Routing and Switching ............................ 3
CISCO Networking Academy (CCNA): Wide Area Network and Project-Based Learning .................. 3

And a minimum of 3 units from the following: .. 3
CISP 370  Beginning Visual Basic (4)
CISS 341  Implementing Windows Operating System Security (3)

Associate Degree Requirements: The CIS: Computer Networking Management Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.
Career Opportunities
Upon completion of the computer programming degree, a student has the minimum qualifications as an entry-level programmer/developer.

Core Requirements for Degree 10 Units
CISC 310 Introduction to Computer Information Science ................. 3
CISP 300 Algorithm Design/Problem Solving .................................. 3
CISP 453 Introduction to Systems Programming in UNIX (4) ............ 4
or CISA 321 Intermediate Database Management (1) ...........................
and CISP 350 Database Programming (3)

C++ Concentration 22 Units
Core Requirements ........................................................................ 10
CISP 360 Introduction to Structured Programming ......................... 4
CISP 400 Object Oriented Programming with C++ ......................... 4
CISP 430 Data Structures ................................................................ 4

Java Concentration 21 Units
Core Requirements ........................................................................ 10
CISP 360 Introduction to Structured Programming ......................... 4
CISP 401 Object Oriented Programming with Java ......................... 4
CISP 457 Computer Systems Analysis and Design .......................... 3

Visual Basic Concentration 21 Units
Core Requirements ........................................................................ 10
CISP 370 Beginning Visual Basic ..................................................... 4
CISP 371 Intermediate Visual Basic ................................................ 4
CISP 457 Computer Systems Analysis and Design .......................... 3

Cobol Concentration 21 Units
Core Requirements ........................................................................ 10
CISP 320 COBOL Programming ..................................................... 4
CISP 321 Advanced COBOL Programming ...................................... 4
CISP 457 Computer Systems Analysis and Design .......................... 3

Associate Degree Requirements: The CIS: Database Management Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

CIS: Database Management Certificate
The CIS: Database Management certificate involves the study of relational database technology used in the business environment. The emphasis is on selecting the appropriate system platform for database deployment. Course work includes database system design and programming for desktop, enterprise and Internet platforms, structure query language (SQL) programming, introductory principles of modular programming, system design and problem solving, desktop operating systems, and electronic spreadsheets.

Requirements for Certificate 22 Units
CISA 315 Introduction to Electronic Spreadsheets .......................... 2
CISA 320 Introduction to Database Management ............................ 1
CISA 321 Intermediate Database Management .............................. 1
CISC 320 Operating Systems ....................................................... 1
CISP 300 Algorithm Design/Problem Solving ............................... 3
CISP 350 Database Programming ................................................ 3
CISP 370 Beginning Visual Basic .................................................. 4
CISW 300 Web Publishing ............................................................ 3
CISW 410 Middleware Web Scripting ........................................... 4

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

Requirements for Degree 38 Units
BUS 310 Business Communications ............................................. 3
CISA 126 Outlook: Basics ............................................................ 1
or BUSTEC 126 Outlook: Basics .................................................. 1
CISA 127 Outlook: Tools ............................................................. 1
or BUSTEC 127 Outlook: Tools .................................................... 1
CISA 305 Beginning Word Processing ......................................... 2
CISA 306 Intermediate Word Processing ...................................... 2
CISA 315 Introduction to Electronic Spreadsheets ........................... 2
CISA 316 Intermediate Electronic Spreadsheets ............................ 2
CISA 320 Introduction to Database Management .......................... 1
CISA 321 Intermediate Database Management .............................. 1
CISA 330 Desktop Publishing ....................................................... 2
CISA 340 Presentation Graphics ................................................... 2
CISC 306 Introduction to Web Page Creation ................................... 1
CISC 310 Introduction to Computer Information Science .............. 3
CISC 320 Operating Systems ....................................................... 1
CISC 323 Linux Operating System ................................................ 1
CISP 370 Beginning Visual Basic .................................................. 4

And a minimum of 1 unit from the following: ................................ 1
BUSTEC 300 Beginning Keyboarding/Applications (1 - 3)
And a minimum of 5 units from the following: ........................................... 5
ACCT 341  Accounting on the Microcomputer (2) ........................................ 3
BUSTEC 126  Outlook: Basics (1)
CISA 141  Capturing and Publishing Digital Media (2) .......................... 2
CISA 160  Project Management Techniques and Software (3) ............ 2
CISA 171  Introduction to Adobe Acrobat (1) ........................................... 2
CISP 350  Introduction to Data Communications (1) ............................ 2
CISP 351  Introduction to Local Area Networks (1) ............................... 2
CISP 371  Intermediate Visual Basic (4) .................................................. 2
CISP 457  Computer Systems Analysis and Design (3) ............................ 2
CISW 300  Web Publishing (3) ............................................................... 2
CISW 307  Introduction to Web Development and Design (3) ................. 2

And a minimum of 3 units from the following: ........................................... 3
ACCT 343  Computer Spreadsheet Applications for Accounting (2) ......... 1
CISA 331  Intermediate Desktop Publishing (2) ................................. 1
CISP 305  Introduction to the Internet (1) ........................................... 1
CISP 350  Database Programming (3) .................................................. 1
CISP 360  Introduction to Structured Programming (4) ......................... 1
CISP 371  Intermediate Visual Basic (4) ................................................ 1
CISP 457  Computer Systems Analysis and Design (3) ......................... 1
CISW 300  Introduction to Information Systems Security (1) ............... 1
CISW 370  Designing Accessible Web Sites (1) ................................. 1

Taken on the Windows operating system.

Associate Degree Requirements: The CIS: Microcomputer Applications
Associate in Arts (A.A.) Degree may be obtained by completion of the
required program, plus general education requirements, plus sufficient
electives to meet a 60-unit total. See ARC graduation requirements.

CIS: Microcomputer Applications Certificate

This certificate involves the use of the microcomputer and cur-
cent, commonly used software applications to solve problems in
a business environment. Course work includes microcomputer ap-
carations in database management, desktop publishing, electronic
sheets, presentation graphics, operating systems, and word
processing.

Requirements for Certificate 24 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 310  Business Commun.</td>
<td>3</td>
</tr>
<tr>
<td>CISA 305  Beginning Word Processing</td>
<td>2</td>
</tr>
<tr>
<td>CISA 306  Intermediate Word Processing</td>
<td>2</td>
</tr>
<tr>
<td>CISA 315  Introduction to Electronic Spreadsheets</td>
<td>2</td>
</tr>
<tr>
<td>CISA 316  Intermediate Electronic Spreadsheets</td>
<td>2</td>
</tr>
<tr>
<td>CISA 320  Introduction to Database Management</td>
<td>1</td>
</tr>
<tr>
<td>CISA 321  Intermediate Database Management</td>
<td>1</td>
</tr>
<tr>
<td>CISA 330  Desktop Publishing</td>
<td>1</td>
</tr>
<tr>
<td>CISA 340  Presentation Graphics</td>
<td>1</td>
</tr>
<tr>
<td>CISP 305  Introduction to the Internet</td>
<td>1</td>
</tr>
<tr>
<td>CISP 306  Introduction to Web Page Creation</td>
<td>1</td>
</tr>
<tr>
<td>CISP 310  Introduction to Computer Information Science</td>
<td>1</td>
</tr>
<tr>
<td>CISP 320  Operating Systems</td>
<td>1</td>
</tr>
<tr>
<td>CISP 350  Introduction to Data Communications</td>
<td>1</td>
</tr>
</tbody>
</table>

Taken on the Windows operating system.

CIS: PC Support Management Degree

The CIS: PC Support Management degree covers the use and
maintenance of a microcomputer's hardware, software and network
connections in today's business environment. Course work includes
learning basic computer skills in configuration, use, and trouble-
shooting major hardware components, different operating systems,
and applications in a standalone and network environment. Addi-
tionally, the degree introduces basic business and project manage-
ment skills. This program covers all the objectives of the Comput-
ing Technology Industry Association (CompTIA) A+ certification exam.

Requirements for Certificate 31 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 300  Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 310  Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>CISA 160  Project Management Techniques and Software</td>
<td>3</td>
</tr>
<tr>
<td>CISC 310  Introduction to Computer Information Science</td>
<td>3</td>
</tr>
<tr>
<td>CISC 320  Operating Systems</td>
<td>1</td>
</tr>
<tr>
<td>CISC 350  Introduction to Data Communications</td>
<td>1</td>
</tr>
<tr>
<td>CISC 351  Introduction to Local Area Networks</td>
<td>1</td>
</tr>
<tr>
<td>CISC 361  Microcomputer Support Essentials - Preparation for A+ Certification</td>
<td>1</td>
</tr>
<tr>
<td>CISC 362  Microcomputer Support Technical - Preparation for A+ Certification</td>
<td>2</td>
</tr>
<tr>
<td>CISC 363  Microcomputer Support Technical - Preparation for A+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CISS 301  Ethical Hacking</td>
<td>2</td>
</tr>
</tbody>
</table>

Associate Degree Requirements: The CIS: PC Support Management
Associate in Science (A.S.) Degree may be obtained by completion of the
required program, plus general education requirements, plus sufficient
electives to meet a 60-unit total. See ARC graduation requirements.

CIS: PC Support Certificate

The CIS: PC Support Certificate involves learning the use of a
microcomputer's hardware, software and networking used in today's
business environment. Course work includes basic computer skills
in configuration, use, and troubleshooting major hardware com-
ponents, different operating systems, and applications in a standalone
and network environment. This program covers all the objectives
of the Computer Technology Industry Associates (CompTIA) A+
certification exam.

Requirements for Certificate 25 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 310  Business Commun.</td>
<td>3</td>
</tr>
<tr>
<td>CISC 310  Introduction to Computer Information Science</td>
<td>3</td>
</tr>
<tr>
<td>CISC 320  Operating Systems</td>
<td>1</td>
</tr>
<tr>
<td>CISC 350  Introduction to Data Communications</td>
<td>1</td>
</tr>
<tr>
<td>CISC 351  Introduction to Local Area Networks</td>
<td>1</td>
</tr>
<tr>
<td>CISC 361  Microcomputer Support Essentials - Preparation for A+ Certification</td>
<td>1</td>
</tr>
<tr>
<td>CISC 362  Microcomputer and Applications Support</td>
<td>2</td>
</tr>
<tr>
<td>CISC 363  Microcomputer Support Technical - Preparation for A+ Certification</td>
<td>3</td>
</tr>
<tr>
<td>CISS 301  Ethical Hacking</td>
<td>2</td>
</tr>
</tbody>
</table>

Taken on the Windows operating system.

And a minimum of 6 units from the following: ........................................... 6
CISA 126  Outlook: Basics (1)
or BUSTEC 126  Outlook: Basics (1)
and CISA 127  Outlook: Tools (1)
or BUSTEC 127  Outlook: Tools (1)
CISA 305  Beginning Word Processing (2)
CISA 315  Introduction to Electronic Spreadsheets (2)
CISA 320  Introduction to Database Management (1)
CISA 340  Presentation Graphics (2)
CISC 306  Introduction to Web Page Creation (1)
CISC 323  Linux Operating System (1)

Taken on the Windows operating system.
Information Systems Security Degree

This program 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 some of the Certified Information Systems Security Professional (CISSP) certification exams.

Requirements for Degree ........................................ 33 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 310</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>CISC 323</td>
<td>Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CISC 324</td>
<td>Intermediate Linux Operating System</td>
<td>3</td>
</tr>
<tr>
<td>CISN 110</td>
<td>Networking Technologies - Preparation for N+ Certification</td>
<td>2</td>
</tr>
<tr>
<td>CISN 111</td>
<td>Intermediate Networking Technologies - Preparation for N+ Certification</td>
<td>2</td>
</tr>
<tr>
<td>CISN 300</td>
<td>Network Systems Administration</td>
<td>3</td>
</tr>
<tr>
<td>CISN 302</td>
<td>Intermediate Network Systems Administration</td>
<td>3</td>
</tr>
<tr>
<td>CISN 307</td>
<td>Windows Active Directory Services</td>
<td>3</td>
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<tr>
<td>CISN 310</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CISN 325</td>
<td>Network Security and Firewalls</td>
<td>3</td>
</tr>
<tr>
<td>CISN 341</td>
<td>Implementing Windows Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>or CISN 342</td>
<td>Implementing Linux Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>CISN 350</td>
<td>Disaster Recovery</td>
<td>3</td>
</tr>
<tr>
<td>CISN 360</td>
<td>Computer Forensics and Investigation</td>
<td>3</td>
</tr>
<tr>
<td>CISN 311</td>
<td>Networking Technologies - Preparation for N+ Certification</td>
<td>2</td>
</tr>
<tr>
<td>CISN 312</td>
<td>Intermediate Networking Technologies - Preparation for N+ Certification</td>
<td>2</td>
</tr>
</tbody>
</table>

Associate Degree Requirements: The Information Systems Security Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Information Systems Security Certificate

This program provides the information and skills necessary for network administrators to implement security to protect against internal and external threats to an enterprise network, and covers client and server security on different operating systems. This program provides preparation for several certification exams, including the Computer Technology Industry Association (CompTIA) Security+ exam, Microsoft Certified Systems Engineer (MCSE) exams and some of the Certified Information Systems Security Professional (CISSP) certification exams.

Requirements for Certificate ........................................ 23 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 323</td>
<td>Linux Operating System</td>
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</tr>
<tr>
<td>CISC 324</td>
<td>Intermediate Linux Operating System</td>
<td>1</td>
</tr>
<tr>
<td>CISC 300</td>
<td>Network Systems Administration</td>
<td>1</td>
</tr>
<tr>
<td>CISC 302</td>
<td>Intermediate Network Systems Administration</td>
<td>3</td>
</tr>
<tr>
<td>CISC 307</td>
<td>Windows Active Directory Services</td>
<td>3</td>
</tr>
<tr>
<td>CISC 310</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CISC 325</td>
<td>Network Security and Firewalls</td>
<td>3</td>
</tr>
<tr>
<td>CISC 341</td>
<td>Implementing Windows Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>or CISC 342</td>
<td>Implementing Linux Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>And a minimum of 3 units from the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CISN 110</td>
<td>Networking Technologies - Preparation for N+ Certification (2)</td>
<td>3</td>
</tr>
<tr>
<td>CISN 111</td>
<td>Intermediate Networking Technologies - Preparation for N+ Certification (2)</td>
<td>3</td>
</tr>
<tr>
<td>CISN 140</td>
<td>CISCO Networking Academy (CCNA): Data Communication and Networking Fundamentals (3)</td>
<td>3</td>
</tr>
<tr>
<td>CISS 301</td>
<td>Ethical Hacking (2)</td>
<td>3</td>
</tr>
</tbody>
</table>

CIS: Computer Programming Certificate

This certificate provides up-to-date and general knowledge in the field of computer programming, such as syntax, programming methodologies, and structured programming. It also includes topics relating to the work environment of a programmer. Such topics include operating systems and systems analysis.

Career Opportunities

The programming certificate enables people who are already in information technology and computer fields to develop programs.

Core Requirements for Certificate ........................................ 10 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 310</td>
<td>Introduction to Computer Information Science</td>
<td>3</td>
</tr>
<tr>
<td>CISC 320</td>
<td>Operating System</td>
<td>1</td>
</tr>
<tr>
<td>CISP 300</td>
<td>Algorithm Design/Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>CISP 457</td>
<td>Computer Systems Analysis and Design</td>
<td>3</td>
</tr>
</tbody>
</table>

C++ Concentration Requirements ........................................ 22 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISP 360</td>
<td>Introduction to Structured Programming</td>
<td>4</td>
</tr>
<tr>
<td>CISP 401</td>
<td>Object Oriented Programming with Java</td>
<td>4</td>
</tr>
</tbody>
</table>

Java Concentration Requirements ........................................ 22 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISP 350</td>
<td>Database Programming</td>
<td>3</td>
</tr>
<tr>
<td>CISP 360</td>
<td>Introduction to Structured Programming</td>
<td>4</td>
</tr>
<tr>
<td>CISP 401</td>
<td>Object Oriented Programming with Java</td>
<td>4</td>
</tr>
</tbody>
</table>

Visual Basic Concentration Requirements ........................................ 22 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISA 321</td>
<td>Intermediate Database Management</td>
<td>1</td>
</tr>
<tr>
<td>CISP 350</td>
<td>Database Programming</td>
<td>3</td>
</tr>
<tr>
<td>CISP 370</td>
<td>Beginning Visual Basic</td>
<td>4</td>
</tr>
<tr>
<td>CISP 371</td>
<td>Intermediate Visual Basic</td>
<td>4</td>
</tr>
</tbody>
</table>

Computer Information Security Essentials Certificate

This program provides the basic information and skills necessary for network administrators to implement security from internal and external threats to a network. It also provides preparation for the Computing Technology Industry Association (CompTIA) Security+ exam.

Requirements for Certificate ........................................ 12 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 310</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CISC 325</td>
<td>Network Security and Firewalls</td>
<td>3</td>
</tr>
<tr>
<td>CISC 341</td>
<td>Implementing Windows Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>or CISC 342</td>
<td>Implementing Linux Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>CISC 360</td>
<td>Computer Forensics and Investigation</td>
<td>3</td>
</tr>
</tbody>
</table>

Network Administration Essentials - Windows Certificate

This program provides the information and skills necessary for network administration professionals to administer a Windows Active Directory domain-based enterprise network. It also provides preparation for several Microsoft Certified Systems Engineer (MCSE) certification exams.

Requirements for Certificate ........................................ 33 Units

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 310</td>
<td>Network Security Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CISC 325</td>
<td>Network Security and Firewalls</td>
<td>3</td>
</tr>
<tr>
<td>CISC 341</td>
<td>Implementing Windows Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>or CISC 342</td>
<td>Implementing Linux Operating System Security (3)</td>
<td>3</td>
</tr>
<tr>
<td>CISS 301</td>
<td>Ethical Hacking (2)</td>
<td>3</td>
</tr>
</tbody>
</table>
Web Information Science

Web Information Science

Web Publishing Certificate
The web publishing certificate offers a program of study for students seeking jobs in the fields of web-based programming and web application development. The program provides students with the necessary skills and aptitudes for creating and maintaining interactive, database-driven, web applications.

Requirements for Certificate 12 Units
CISN 300  Network Systems Administration ........................................ 3
CISN 302  Intermediate Network Systems Administration .................... 3
CISN 307  Windows Active Directory Services ..................................... 3
CISN 308  Internetworking with TCP/IP ................................................. 3

Other Programs
American River College Catalog 2008-200996

Technical Communication Degree
Requirements for Degree 42.5 Units
ART 320  Design: Fundamentals (3) .................................................. 3
or ARTNM 310  Design: Fundamentals (3) ........................................... 3
ART 323  Design: Color Theory ......................................................... 3
ARTNM 303  Graphic Design: Typography ........................................... 3
CISA 305  Beginning Word Processing ............................................... 2
CISA 306  Intermediate Word Processing ............................................ 2
CISC 320  Operating Systems .............................................................. 1
CISW 300  Web Publishing ................................................................. 3
ENGWR 342  Introduction to Technical/Professional Communication ...... 3
ENGWR 344  Technical/Professional Communication: Writing Reports ...... 1.5
or ENGWR 348  Technical/Professional Communication: Plain English
or ENGWR 350  Technical/Professional Communication: Proposal Writing
ENGWR 352  Technical/Professional Communication: Writing Technical Manuals .................................................. 3

And a minimum of 6 units from the following: ........................................ 6
ENGCW 450  College Literary Magazine (3)
ENGWR 330  Writing for Publication (3)
ENGWR 331  Writing for Publication (3)
ENGWR 354  Introduction to Careers in Technical Communication (1)
ENGWR 356  Writing Formal Reports (1)
ENGWR 358  Writing Training Materials (1)
JOUR 300  Newswriting and Reporting (3)
JOUR 401  College Newspaper Production (2)
SPEECH 321  Interpersonal Communication (3)
or SPEECH 331  Group Discussion (3)

And a minimum of 12 units from the following: ..................................... 12
ARTNM 324  Digital Design (3)
ARTNM 328  Digital Photo Imagery - Photoshop Basics (3)
ARTNM 330  Intermediate Digital Photo Imagery (3)
ARTNM 352  Design for Publication (3)
or CISA 330  Desktop Publishing (2)
and CISA 331  Intermediate Desktop Publishing (2)
ARTNM 354  Digital Prepress (3)
ARTNM 402  Intermediate Web Design (3)
ARTNM 404  Interactive Multimedia Basics (3)
CISA 315  Introduction to Electronic Spreadsheets (2)
CISA 340  Presentation Graphics (2)
CISW 310  Advanced Web Publishing (4)

Associate Degree Requirements: The Technical Communications Associate in Arts (A.A.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Technical Communication Certificate
Requirements for Certificate 20.5-21.5 Units
ARTNM 352  Design for Publication (3) .................................................. 3
or CISA 330  Desktop Publishing (2)
and CISA 331  Intermediate Desktop Publishing (2)
CISA 305  Beginning Word Processing ............................................... 2
CISA 306  Intermediate Word Processing ............................................ 2
ENGWR 342  Introduction to Technical/Professional Communication ...... 3
ENGWR 344  Technical/Professional Communication: Writing Reports ...... 1.5
or ENGWR 348  Technical/Professional Communication: Plain English
or ENGWR 350  Technical/Professional Communication: Proposal Writing
ENGWR 352  Technical/Professional Communication: Writing Technical Manuals .................................................. 3
### CIS - Applications

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISA 305</td>
<td>Beginning Word Processing</td>
<td>2</td>
</tr>
<tr>
<td>CISA 306</td>
<td>Intermediate Word Processing</td>
<td>2</td>
</tr>
<tr>
<td>CISA 308</td>
<td>Exploring Word Processing and Presentation Software</td>
<td>1</td>
</tr>
<tr>
<td>CISA 171</td>
<td>Introduction to Adobe Acrobat</td>
<td>1</td>
</tr>
<tr>
<td>CISA 126</td>
<td>Outlook: Basics</td>
<td>1</td>
</tr>
<tr>
<td>CISA 127</td>
<td>Outlook: Tools</td>
<td>1</td>
</tr>
<tr>
<td>CISA 141</td>
<td>Capturing and Publishing Digital Media</td>
<td>2</td>
</tr>
<tr>
<td>CISA 160</td>
<td>Project Management Techniques and Software</td>
<td>3</td>
</tr>
<tr>
<td>CISA 294</td>
<td>Topics in Computer Information Science - Applications</td>
<td>.5-.5</td>
</tr>
</tbody>
</table>

**CISA 305: Beginning Word Processing**
- **Units:** 2
- **Advisory:** CISC 300
- **Hours:** 18 hours LEC
- This course introduces word processing with emphasis on document production techniques. Students are introduced to the use of basic word processing features such as merge, sort, styles, table of contents, document production, and merge features. The course culminates with the study of intermediate level features such as merge, sort, graphics, macros, style, and templates. This course may be taken twice on a different software package or version.

**CISA 306: Intermediate Word Processing**
- **Units:** 2
- **Advisory:** CISA 305 with grade of “C” or better.
- **Course Transferable to CSU:** Yes
- **Hours:** 27 hours LEC, 27 hours LAB
- This course introduces word processing operations such as creating, editing, file management techniques, and printing text. Emphasis is on formatting and document production techniques to produce professional business documents used in today's workplace. The course culminates with the study of intermediate level features such as merge, sort, graphics, macros, style, and templates. This course may be taken four times on a different software package or version.

**CISA 308: Exploring Word Processing and Presentation Software**
- **Units:** 1
- **Course Transferable to CSU:** Yes
- **Hours:** 18 hours LEC
- This course introduces word processing and presentation software. The basic features and skills of creating, editing, and formatting documents, inserting tables and graphics, and enhancing word documents are covered. PowerPoint presentations are included.

**CISA 171: Introduction to Adobe Acrobat**
- **Units:** 1
- **Hours:** 9 hours LEC, 27 hours LAB
- This course introduces Adobe Acrobat tools for creating, editing, reading, and printing Portable Document Format (PDF) documents. Topics include software navigation, converting other file types to PDF, and customizing output quality. Additional topics include modifying PDF files, placing documents on-line, adding digital signatures and security, creating presentations, manipulating graphics, and managing eBooks.

**CISA 294: Topics in Computer Information Science - Applications**
- **Units:** .5-.5
- **Prerequisite:** To be determined with each topic.
- **Hours:** 72 hours LEC, 54 hours LAB
- This is an individualized course developed in cooperation with industry and/or government to meet specialized training needs. The course may be taken twice for credit.

**American River College Catalog 2008-2009**
CISA 316 Intermediate Electronic Spreadsheets 2 Units
Prerequisite: CISA 315 with a grade of “C” or better.
Course Transferable to CSU
Hours: 27 hours LEC; 27 hours LAB
This course is a continuation of electronic worksheets with emphasis on workbook design and integration, template design, use of complex formulas, and built-in financial and logical functions. The course also includes look-up tables, use of worksheet analysis tools, macros, and data integration. The course may be taken four times for credit on a different software package or version.

CISA 318 Exploring Spreadsheet Software 1 Unit
Course Transferable to CSU
The course introduces widely used spreadsheet software. The basic features and skills of editing and formatting a spreadsheet, using basic formulas and functions, inserting and formatting charts and graphics in a spreadsheet workbook and analyzing and presenting that workbooks are covered.

CISA 320 Introduction to Database Management 1 Unit
Advisory: BUSTEC 300 and CISC 300
General Education: AA/AS Area II(b)
Course Transferable to CSU
Hours: 18 hours LEC, 18 hours LAB
This course introduces the student, through hands-on operation, to the use of database management programs on the microcomputer. It includes designing a database; assessing, searching, and updating files, and designing and producing printed reports. This course may be taken four times for credit on a different software package or version.

CISA 321 Intermediate Database Management 1 Unit
Prerequisite: CISA 320 with grade of “C” or better.
Course Transferable to CSU
Hours: 18 hours LEC, 18 hours LAB
This course continues the study of microcomputer database with emphasis on database design, reporting, application building, and utilization of files created using other software. This course may be taken four times on a different software package or version.

CISA 322 Advanced Database Management 1 Unit
Prerequisite: CISA 321 with a grade of “C” or better in the corresponding software application CISA 322 package.
Course Transferable to CSU
Hours: 18 hours LEC, 18 hours LAB
This course continues the study of microcomputer database with emphasis on database design, reporting, application building, and utilization of files created using other software. The course may be taken four times for credit on a different software package or version.

CISA 330 Desktop Publishing 2 Units
Advisory: CISC 300, CISA 300 and ability to touch type.
Course Transferable to CSU
Hours: 27 hours LEC, 27 hours LAB
The course is designed to present an overview of desktop publishing and a major desktop publishing program. Material presented will include page layout skills needed to produce newsletters, brochures, flyers, reports, and directories on the computer. File and equipment management techniques will be presented. This course may be taken four times on a different software package or version.

CISA 331 Intermediate Desktop Publishing 2 Units
Prerequisite: CISA 330 with a grade of “C” or better.
Course Transferable to CSU
Hours: 27 hours LEC, 27 hours LAB
This course is designed to present an overview of advanced desktop publishing (DTP) skills. Advanced techniques in page layout and design, select and use software programs which interface with DTP, use advanced typographic features, create and integrate image/graphic designs, handle files and directories, and analyze DTP needs and equipment integration will be presented. This course may be taken four times on a different software package or version.

CISA 340 Presentation Graphics 2 Units
Advisory: CISC 300.
Course Transferable to CSU
Hours: 27 hours LEC, 27 hours LAB
This course presents an in-depth look at using presentation software in business environments. Topics include design, slide show techniques, integrating and linking of various software applications and media, animation effects, and the production of presentations using a variety of hardware. This course may be taken four times on a different software package or version.

CISC 100 Computer Fundamentals with Hands-on Lab 2 Units
Hours: 27 hours LEC, 27 hours LAB
This introductory course provides general non-technical knowledge combined with a hands-on lab on how computers work including basic computer terminology and concepts. The focus is slower paced instruction with extensive hands-on reinforcement of instructional concepts. Course topics include an introduction to the operating system software and application software focusing on word processing, spreadsheets, the Internet and email.

CISC 294 Topics in Computer Information Science - Core .5-5 Units
Prerequisite: To be determined with each topic.
Hours: 72 hours LEC, 54 hours LAB
This is an individualized course developed in cooperation with industry and/or government to meet specialized training needs. The course may be taken twice for credit.

CISC 300 Computer Familiarization 1 Unit
Advisory: ENGRD 116 or ESLR 320, and the ability to touch type.
General Education: AA/AS Area II(b); AA/AS Area III(b)
Course Transferable to CSU
Hours: 18 hours LEC
This course provides an overview of computer hardware and software, and an introduction to computer concepts. Topics include hardware components, microprocessors, the operating system, word processing, spreadsheets, and Internet software. The course may be taken twice for credit.

CISC 305 Introduction to the Internet 1 Unit
Advisory: CISC 300 and 320
Course Transferable to CSU
Hours: 18 hours LEC, 18 hours LAB
This course is an introduction to how the Internet works and how to effectively use basic Internet services. Topics include E-mail, E-mail lists, the World Wide Web, search engines, newsgroups, Telnet, File Transfer Protocol (FTP), various forms of asynchronous communications such as Really Simple Syndication (RSS), and Internet security considerations.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Advisory/Prerequisite</th>
<th>Course Transferable to CSU</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 306</td>
<td>Introduction to Web Page Creation</td>
<td>1</td>
<td>CISC 305</td>
<td>Course Transferable to CSU</td>
<td>18</td>
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<tr>
<td>CISC 308</td>
<td>Exploring Computer Environments and the Internet</td>
<td>1</td>
<td>CISC 306, CISA 305, CISA 306, CISA 315, CISA 316, or CISA 320.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 309</td>
<td>Applied Applications Lab</td>
<td>.5</td>
<td>CISC 300, CISA 305, CISA 306, CISA 315, CISA 316, or CISA 320.</td>
<td>Course Transferable to CSU</td>
<td>27</td>
</tr>
<tr>
<td>CISC 310</td>
<td>Introduction to Computer Information Science</td>
<td>3</td>
<td>CISC 300, CISA 305, CISA 306, CISA 315, CISA 316, and CISA 320 by providing supplemental lab instruction. The material reinforces the concepts and techniques presented in these courses. This course may be taken four times. Credit/no credit only.</td>
<td>Course Transferable to UC/CSU</td>
<td>54</td>
</tr>
<tr>
<td>CISC 320</td>
<td>Operating Systems</td>
<td>1</td>
<td>CISC 300 and ability to touch type.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 322</td>
<td>Linux Operating System</td>
<td>1</td>
<td>CISC 300 and ability to touch type.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 324</td>
<td>Intermediate Linux Operating System1</td>
<td>1</td>
<td>CISC 323 with a grade of “C” or better.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 335</td>
<td>Introduction to Data Communications</td>
<td>1</td>
<td>CISC 300 and ability to touch type.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 351</td>
<td>Introduction to Local Area Networks</td>
<td>1</td>
<td>CISC 320 and 350</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 359</td>
<td>Applied Applications Lab</td>
<td>.5</td>
<td>CISC 300, CISA 305, CISA 306, CISA 315, CISA 316, and CISA 320.</td>
<td>Course Transferable to CSU</td>
<td>27</td>
</tr>
<tr>
<td>CISC 360</td>
<td>Microcomputer Support Essentials - Preparation for A+ Certification</td>
<td>3</td>
<td>-</td>
<td>Course Transferable to CSU</td>
<td>42</td>
</tr>
<tr>
<td>CISC 361</td>
<td>Microcomputer Support Essentials - Preparation for A+ Certification</td>
<td>3</td>
<td>-</td>
<td>Course Transferable to CSU</td>
<td>42</td>
</tr>
<tr>
<td>CISC 362</td>
<td>Microcomputer and Applications Support</td>
<td>2</td>
<td>CISC 305, 315, and 320 with grades of “C” or better.</td>
<td>Course Transferable to CSU</td>
<td>18</td>
</tr>
<tr>
<td>CISC 363</td>
<td>Microcomputer Support Technical - Preparation for A+ Certification</td>
<td>3</td>
<td>CISC 361 with a grade of “C” or better</td>
<td>Course Transferable to CSU</td>
<td>42</td>
</tr>
</tbody>
</table>

This course covers the production of web pages, including design, layout, construction, and presentation. A web authoring tool is used to format a web page and Extensible Hypertext Markup Language (XHTML) is introduced. This course may be taken four times for credit on a different software package or version.

This course is a survey of the computer field covering the functional and social impact of the computer.

This course introduces the fundamentals of microcomputer hardware, software and computer networking, focusing on operating systems. The fundamentals of the Internet and Internet tools are introduced.

This course introduces the functionalities of microcomputer hardware, software and computer networking, focusing on operating systems. This course along with CISC 361 prepares students for the Computing Technology Industry Association (CompTIA) A+ certification.

This course introduces operating systems for the PC. Topics include file systems, operating system services, program management, file and directory organization, and hard drive maintenance. It also includes information on protecting your PC from viruses, Trojans, worms, adware, spyware, and other malicious network exploits. Additional topics are DOS commands and batch files. The course may be taken four times on a different Windows operating system version.

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This course is the second of two courses providing a foundation in personal computer (PC) support. Hands-on skills include advanced component installation and configuration, troubleshooting component hardware, and configuring and troubleshooting major operating systems and networking hardware. This course along with CISC 363 prepares students for the Computing Technology Industry Association (CompTIA) A+ Certification exam.
CISN 122 Network Administration with Linux: LAN Services 2 Units
Prerequisite: CISN 120 with a grade of “C” or better.
Advisory: CISN 119.
Hours: 27 hours LEC, 27 hours LAB
This course covers Linux network administration of local area network (LAN) services. Topics focus on server and LAN services including the network file system (NFS), share resources between Linux and Microsoft Windows using Server Message Block (SMBs), network information service (NIS), virtual network computing (VNC), remote network access, the secure shell (SSH) vs. telnet, X-windows as a network service, and dynamic host configuration protocol (DHCP). The course also covers the command scheduler (cron), monitoring and logging system activities and system events (syslog), as well as installing and configuring MySQL Structured Query Language (SQL) database management service.

CISN 120 Beginning Network Administration with Linux: LAN Services 2 Units
Prerequisite: CISN 120 with a grade of “C” or better.
Advisory: CISN 119.
Hours: 18 hours LEC, 300 hours LAB
This course is supervised work experience in Computer Information Science for the purpose of increasing the understanding of the nature and scope of the operation of business, government or service agencies. This course requires that students be employed in a paid or volunteer work experience environment. May be taken twice for a maximum of 8 units.

CISN 119 TCP/IP Protocols 3 Units
Advisory: CISC 350.
Hours: 54 hours LEC
This course covers the TCP/IP protocol suite for the Internet. Information to support and manage TCP/IP is provided.

CISN 118 Internet Protocol Subnetting 1 Unit
Advisory: CISN 110 and MATH 25
Hours: 18 hours LEC
This course introduces Transmission Control Protocol/Internet Protocol (TCP/IP) address assigning and subnetting. Topics include a review of binary, hexadecimal, and decimal numbering systems, classes of Internet Protocol (IP) addresses, Classless Inter-domain Routing (CIDR), and Variable Length Subnet Masks (VLSM). The future of IP addressing, version 4 (IPv4) and version 6 (IPv6), is covered.

CISN 117 Intermediate Networking Technologies - Preparation for N+ Certification 2 Units
Prerequisite: CISN 110 with a grade of “C” or better
Hours: 36 hours LEC
This is an intermediate course in networking software and hardware. Topics include network operating systems setup, analyzing network performance, diagnosing and repairing of network problems, and network security techniques. This course, along with CISN 110, provides preparation for the Computer Technology Industry Association N+ certification test.

CISN 116 Network Administration with Linux: LAN Services 2 Units
Prerequisite: CISN 120 with a grade of “C” or better.
Advisory: CISN 119.
Hours: 27 hours LEC, 27 hours LAB
This course covers Linux network administration of Internet services. Topics focus on server and TCP/IP services including the internet services daemon (XINETD), file transfer protocol (FTP), email, domain name service (DNS), firewall, secure shell, and proxy services. Installing and configuring the Apache Web Server and Webmin (the Linux web based administration tool) are introduced.

CISN 115 Networking Technologies - Preparation for N+ Certification 2 Units
Hours: 36 hours LEC
This is an introductory course in networking software and hardware. Topics include modems, communication protocols, local and wide area networks, intra- and inter-networks, network architectures, topologies, and the Open Systems Interconnect (OSI) model. This course, along with CISN 111, provides preparation for the Computer Technology Industry Association N+ certification test.

CISN 114 Cisco Networking Academy (CCNA)tm: Networking Theory and Routing Technologies 3 Units
Prerequisite: CISN 140 with a grade of “C” or better.
Advisory: CISN 310, OR CISN 300 and 320.
Hours: 54 hours LEC, 18 hours LAB
This course provides an introduction to networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 113 Advanced Routing and Switching 3 Units
Prerequisite: CISN 112 with a grade of “C” or better.
Advisory: CISN 122.
Hours: 54 hours LEC, 18 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. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 112 Network Administration with Linux: Internet Services 2 Units
Prerequisite: CISN 120 with a grade of “C” or better.
Advisory: CISN 119.
Hours: 27 hours LEC, 27 hours LAB
This course covers Linux network administration of local area network (LAN) services. Topics focus on server and LAN services including the network file system (NFS), share resources between Linux and Microsoft Windows using Server Message Block (SMBs), network information service (NIS), virtual network computing (VNC), remote network access, the secure shell (SSH) vs. telnet, X-windows as a network service, and dynamic host configuration protocol (DHCP). The course also covers the command scheduler (cron), monitoring and logging system activities and system events (syslog), as well as installing and configuring MySQL Structured Query Language (SQL) database management service.

CISN 111 Intermediate Networking Technologies - Preparation for N+ Certification 2 Units
Prerequisite: CISN 110 with a grade of “C” or better
Hours: 36 hours LEC
This is an intermediate course in networking software and hardware. Topics include network operating systems setup, analyzing network performance, diagnosing and repairing of network problems, and network security techniques. This course, along with CISN 110, provides preparation for the Computer Technology Industry Association N+ certification test.

CISN 110 Networking Technologies - Preparation for N+ Certification 2 Units
Hours: 36 hours LEC
This is an introductory course in networking software and hardware. Topics include modems, communication protocols, local and wide area networks, intra- and inter-networks, network architectures, topologies, and the Open Systems Interconnect (OSI) model. This course, along with CISN 111, provides preparation for the Computer Technology Industry Association N+ certification test.

CISN 109 Fundamentals of Networking 3 Units
Advisory: CISN 110 and MATH 25
Hours: 18 hours LEC
This course introduces Transmission Control Protocol/Internet Protocol (TCP/IP) address assigning and subnetting. Topics include a review of binary, hexadecimal, and decimal numbering systems, classes of Internet Protocol (IP) addresses, Classless Inter-domain Routing (CIDR), and Variable Length Subnet Masks (VLSM). The future of IP addressing, version 4 (IPv4) and version 6 (IPv6), is covered.

CISN 108 Network Administration with Linux: Internet Services 2 Units
Prerequisite: CISN 107 with a grade of “C” or better.
Advisory: CISN 109.
Hours: 27 hours LEC, 27 hours LAB
This course covers Linux network administration of local area network (LAN) services. Topics focus on server and LAN services including the network file system (NFS), share resources between Linux and Microsoft Windows using Server Message Block (SMBs), network information service (NIS), virtual network computing (VNC), remote network access, the secure shell (SSH) vs. telnet, X-windows as a network service, and dynamic host configuration protocol (DHCP). The course also covers the command scheduler (cron), monitoring and logging system activities and system events (syslog), as well as installing and configuring MySQL Structured Query Language (SQL) database management service.

CISN 107 Beginning Networking Technologies 3 Units
Prerequisite: CISN 106 with a grade of “C” or better
Advisory: CISN 109.
Hours: 27 hours LEC
This course covers the basics of installation and administration of the Linux Network Operating System. Topics include installation of the Linux server, connecting to a network, utilizing network utilities, administering and maintaining network printing, protecting network data, and installing network applications. This course also covers planning, accessing, and managing file systems, planning and implementing login and file system security, administering and maintaining user accounts, upgrading the kernel, and backing up servers.

CISN 106 Networking Fundamentals 3 Units
Advisory: CISN 105.
Hours: 27 hours LEC
This course introduces data communication and networking fundamentals. It surveys data communication hardware and software components and basic networking concepts. Topics 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. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 105 Introduction to Networking Fundamentals 3 Units
Advisory: CISN 101.
Hours: 27 hours LEC
This course introduces networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 104 Networking Technologies - Preparation for N+ Certification 2 Units
Prerequisite: CISN 103 with a grade of “C” or better.
Advisory: CISN 106.
Hours: 27 hours LEC
This is an introductory course in networking software and hardware. Topics include modems, communication protocols, local and wide area networks, intra- and inter-networks, network architectures, topologies, and the Open Systems Interconnect (OSI) model. This course, along with CISN 105, provides preparation for the Computer Technology Industry Association N+ certification test.

CISN 103 Introduction to Networking Technology 3 Units
Advisory: CISN 101.
Hours: 27 hours LEC
This course introduces networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 102 Networking Fundamentals 3 Units
Advisory: CISN 101.
Hours: 27 hours LEC
This course introduces data communication and networking fundamentals. It surveys data communication hardware and software components and basic networking concepts. Topics 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. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 101 Computer Networking Fundamentals 3 Units
Advisory: CISN 100.
Hours: 27 hours LEC
This course introduces networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 100 Introduction to Networking Technologies 3 Units
Advisory: CISN 101.
Hours: 27 hours LEC
This course introduces networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 100 Introduction to Networking Technologies 3 Units
Advisory: CISN 101.
Hours: 27 hours LEC
This course introduces networking theory and routing technologies, including OSI Model, IP addressing, routing concepts, LAN media, and network management and analyses. This is the second course in preparation for Cisco CCNA certification examination. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).
CISN 143  CISCO Networking Academy (CCNA)tm:
Wide-Area Network and Project-Based Learning  3 Units
Prerequisite: CISN 142 with a grade of “C” or better.
Hours: 54 hours LEC; 18 hours LAB
This course provides the 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. ARC is a certified Cisco Networking Academy and all courses are taught by Cisco Certified Academy Instructors (CCAI).

CISN 190  Client Operating Systems  2 Units
Prerequisite: CISN 102.
Hours: 27 hours LEC; 27 hours LAB
This course covers the planning, installation, configuration and administration of Client Operating Systems. Client Operating Systems are an essential component for both the client/server and peer-to-peer network models. Topics covered include planning the Client Operating System implementation; installation and configuration; managing user resources; connectivity of clients in heterogeneous networking environments; monitoring and optimization of the network; and common troubleshooting techniques.

CISN 300  Network Systems Administration  3 Units
Advisory: CISN 320, 350, and 351.
Course Transferable to CSU
Hours: 45 hours LEC; 27 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 operating system, and managing network security with user and group accounts. Additional topics are creating network shares, setting up and managing network printers, backing up servers, monitoring and setting access permissions on network resources, and establishing policies and procedures for network operations. This course may be taken four times on a different Windows version.

CISN 302  Intermediate Network Systems Administration  3 Units
Prerequisite: CISN 300 with a grade of “C” or better.
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB
This course covers advanced system administration in a client/server network. Topics include configuring the server environment, implementing system policies, implementing and managing fault-tolerant disk volumes, and managing applications. Additional topics covered are managing connectivity for different network and client operating systems, as well as managing and implementing remote servers. This course covers material required for one of the Microsoft MCSE Networking certification examinations. This course may be taken four times on a different Windows software version.

CISN 307  Windows Active Directory Services  3 Units
Prerequisite: CISN 302 with a grade of “C” or better.
Course Transferable to CSU
Hours: 45 hours LEC; 27 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 database. This course may be taken up to four times on different Windows operating system versions.

CISP 308  Internetworking with TCP/IP  3 Units
Prerequisite: CISN 302 with a grade of “C” or better.
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB
This course covers installing, configuring, managing, and supporting a network infrastructure using the Microsoft Windows Server products. It focuses on TCP/IP and related services, including Dynamic Host Configuration Protocol (DHCP), Domain Naming System (DNS), Windows Internet Naming Service (WINS), Internet Information Server (IIS), Public Key Infrastructure (PKI) and certificate service, Internet protocol security (IPSec), Network Address Translation (NAT), and remote access. It also covers configuring Windows as a network router, Virtual Private Network (VPN) connectivity and managing a Windows deployment using Remote Installation Services (RIS). This course may be taken four times on different Windows operating system versions.

CISP 314  Fiber Optic Networking  3 Units
Advisory: CISC 350.
Course Transferable to CSU
Hours: 54 hours LEC
This course introduces basic fiber optical technologies including splices, connectors, optical sources, detectors, optical amplifiers, splitters and modulators. Optical switching technology and fiber based standards and protocols are covered along with services such as voice, data and video. Industry procedures and practices are examined.

CISP 317  Messaging Server Administration  3 Units
Prerequisite: CISN 302 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; backup and restore of the messaging database; and Internet connectivity. This course may be taken four times for credit on different software versions.

CISP 300  Algorithm Design/Problem Solving  3 Units
Advisory: CISC 310.
Course Transferable to CSU
Hours: 54 hours LEC
This course introduces the Computer Science major to methods for solving typical computer problems through algorithm design. Topics covered include assessing and analyzing computer problems in a top-down, divide-and-conquer approach that leads to a programming solution. It also includes programming plans and detailed design documents from which source code versions of programs will be created.
CISP 315  Introduction to Computer Architecture and Design  4 Units
Prerequisite: CISP 310 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 fundamental theories of, and their applications in, digital computer design. Topics include machine code decoding, memory bus cycles, memory, arithmetic and logic unit, registers, latches, Boolean algebra, logic gates, state machines, binary representation, pipelining and Boolean equation optimization. Synthesis of the design of a computer in a hardware description language (HDL) is stressed. All topics are related to programming and overall computer system operations.

CISP 320  COBOL Programming  4 Units
Prerequisite: CISP 300, 340, 365, or 370 with a grade of “C” or better
Advisory: CISP 317
General Education: AA/AS Area II(b)
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This is a course in Programming using the language of COBOL to analyze and solve problems found in business and government. The programs use sequential disk files for input. Both printed reports and disk files are demonstrated output options. Updating of sequential files involves the use of multiple files as input and output. Current methods of problem solving including programming structure, top-down design, and modular programming techniques. Topics covered include report formatting, control breaks, and single and double arrays.

CISP 321  Advanced COBOL Programming  4 Units
Prerequisite: CISP 320 with a grade of “C” or better.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers advanced COBOL concepts and programming techniques. The topics include sequential file processing, data editing, indexed sequential file processing, disk sorts, job control language, debugging techniques, table searching, segmentation, and subroutines. Emphasis is on structured design and structured programming utilizing top-down and modular techniques.

CISP 350  Database Programming  3 Units
Advisory: CISA 320 and CISC 310
General Education: AA/AS Area II(b)
Course Transferable to CSU
Hours: 36 hours LEC; 54 hours LAB
This is an introductory course in Structured Query Language (SQL) database programming. Topics include database normalization, sub-queries, joins, import/export, privileges, and Procedural Language (PL)/SQL programming.

CISP 360  Introduction to Structured Programming  4 Units
Prerequisite: CISP 300, 320, 340, or 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 is an introduction to structured programming and objects. Topics include program design, documentation, testing, and debugging, as well as data representation, data types, variables, constants, and operators. It also includes control structures, interactive and file input/output, standard libraries, arrays, pointers, methods (functions), classes and objects.

CISP 370  Beginning Visual Basic  4 Units
Prerequisite: CISP 370 with a grade of “C” or better.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This is an introductory programming course employing the language of Visual BASIC. Concepts and problems relate to a graphic user interface operating system (such as Windows) and object oriented programming. Terms, rules, and program components used in desktop customization will be explored. Applications include control menu boxes, menu bars, and scroll bar development. This course may be taken four times with a different software version. (CAN CSCI 6)

CISP 371  Intermediate Visual Basic  4 Units
Prerequisite: CISP 370 with a grade of “C” or better.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This is the second course in Visual Basic programming. The course examines data and its relationship to the functions that operate on data. Topics include forms, components, properties, classes, objects, static and dynamic relationships, databases, data sets, queries, hierarchies, inheritance, coding, dialog boxes, associations, testing, and debugging. This course may be taken four times with a different version of Visual Basic.

CISP 400  Object Oriented Programming with C++  4 Units
Prerequisite: CISP 360 with a grade of “C” or better
Advisory: CISC 323
General Education: AA/AS Area II(b)
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course introduces Visual Basic for Applications (VBA) programming for the purposes of application automation and customization. It includes basic programming concepts such as variables, control structures and subroutines. The use of elementary user interface controls are also included in this course.

CISP 401  Object Oriented Programming with Java  4 Units
Prerequisite: CISP 360 with a grade of “C” or better.
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to the C++ programming language and object-oriented programming in the Linux/UNIX environment. Topics include program analysis and design, encapsulation, overloading, classes, inheritance, virtual functions, polymorphism, templates, exception handling, and the standard template library. In addition, basic Linux/UNIX commands and make files are covered.

CISP 372  Beginning Visual Basic for Applications Programming  1 Unit
Course Transferable to CSU
Hours: 20 hours LEC; 15 hours LAB
This course introduces Visual Basic for Applications (VBA) programming for the purposes of application automation and customization. It includes basic programming concepts such as variables, control structures and subroutines. The use of elementary user interface controls are also included in this course.
CISP 430  Data Structures  4 Units
Prerequisite: CISP 360 with a grade of "C" or better.
Advisory: CISP 400.
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course applies object-oriented techniques for systematic problem analysis and the managing of program complexity using abstraction. Specifications, design, coding, testing, and documentation of large multi-file programs are covered. It uses advanced language features such as classes, strings, non-text files, pointers, and recursion. Abstract data types such as stacks, queues, lists, binary trees, heaps/priority queues, hash tables, and graphs are examined. Various sorting and searching algorithms are presented and analyzed using Big-O notation. (CAN CSCI 24)

CISP 440  Discrete Structures for Computer Science  3 Units
Prerequisite: MATH 370 with a grade of "C" or better.
Corequisite: CISP 430
General Education: AA/AS Area II(b); CSU Area B4
Course Transferable to UC/CSU
Hours: 54 hours LEC
This course is an introduction to the essential discrete structures used in Computer Science, with emphasis on their applications. Topics covered include elementary formal logic and set theory, elementary combinatorics, recursive programming and algorithm analysis, finite state machines and formal languages, digital logic and switching, combinatorial circuits, and computer arithmetic.

CISP 453  Introduction to Systems Programming in UNIX  4 Units
Prerequisite: CISP 310, 360, and 430 with grades of "C" or better.
Advisory: CISP 423.
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers the features of the C language commonly used in systems programming, and the application of those features to systems programming in a Linux/UNIX environment. Topics include C preprocessor macros, input/output, bit-manipulation facilities; timesharing system concepts; shell script programming; make files and source code control; basic system calls including fork and exec; pointers and dynamic memory allocation; libraries; and relocation and linking concepts including assembler handling of symbol tables.

CISP 457  Computer Systems Analysis and Design  3 Units
Prerequisite: CISP 300 or 370 with a grade of "C" or better.
Advisory: CISA 305 and 340.
Course Transferable to CSU
Hours: 54 hours LEC
This course covers the methods used to analyze, design, and implement a computer system that meets client business needs. The methodology emphasizes the skills needed by a system analyst throughout the steps of a system development life cycle. These steps include system feasibility, analysis, design, implementation, documentation, and evaluation.

CIS - Security

CISS 300  Introduction to Information Systems Security  1 Unit
Advisory: CISS 320, 350, or 351
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 encryption, security protocols, network security applications, digital signatures, protecting computers and the network from viruses, Trojans, spyware, unsolicited E-mail and public and private key exchange.

CISS 301  Ethical Hacking  2 Units
Advisory: CISS 320, 323, 350 or 351.
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
Advisory: CISN 119, 140, and 302.
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB
This course provides the information and skills required to analyze security risks from potential network intrusions to organizations’ network information systems. Topics cover the required content of the Computing Technology Industry Association (CompTIA) Security+ certification exam.

CISS 325  Network Security and Firewalls  3 Units
Prerequisite: CISS 310 with a grade of "C" or better.
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB
This course covers network and Internet security and deployment of industry standard countermeasures, including configuring Virtual Private Network (VPN) connections. Topics include the evaluation, implementation, and management of secure remote-access technologies. Also covered is the configuration of network firewalls such as Microsoft ISA Server, and allowing access to key services while maintaining security. This course provides preparation for the Check Point Security’s “Check Point Certified Security Administrator” (CCSA) certification exam. This course is not open to students who have completed CISS 320 and CISS 330.

CISS 341  Implementing Windows Operating System Security  3 Units
Prerequisite: CISS 320, CIS 351, and CISS 310
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB
This course provides in-depth information on the Microsoft Windows desktop operating system security features, as well as step-by-step configuration for most effective operating system security. The techniques needed in order to maintain the integrity, authenticity, availability, and privacy of the system and user data are covered. This course may be taken 4 times for credit on different versions of the Microsoft operating system.
CISW 300  Web Publishing  3 Units
Advisory: CISW 300 and CISW 305.  
Course Transferable to CSU  
Hours: 36 hours LEC; 54 hours LAB  
This course is an introduction to publishing on the World Wide Web. Topics include creating web pages with the Hyper Text Markup Languages (HTML), organizing a series of pages into a web site, and uploading web pages to a server. The course makes extensive use of the computer tools necessary to insert HTML tags, create images, and view web documents. It also prepares apprentice web designers and publishers to identify the information dissemination needs of a client, design an appropriate web solution, and implement it.

CISW 307  Introduction to Web Development and Design  3 Units
Same As: ARTNM 401  
Course Transferable to CSU  
Hours: 36 hours LEC; 54 hours LAB  
This course covers the strategies for the development and design of web sites. Using an industry standard web authoring tool, the course integrates both artistic and technical concepts. Topics include assembling, designing and publishing web pages using strategies, principles and processes universally practiced by the professionals in this field. This course, in combination with ARTNM 401, may be taken four times for credit on a different software package or version.

CISW 310  Advanced Web Publishing  4 Units
Prerequisite: CISW 300 with a grade of “C” or better  
Course Transferable to CSU  
Hours: 54 hours LEC; 54 hours LAB  
This course builds upon previous web publishing concepts and study. The primary focus of this course is the systematic development of interactive web sites. Topics include cascading style sheets, dynamic HTML, forms, client-side scripting with JavaScript, Common Gateway Interface (CGI) scripting with Perl, and web-database interactivity.

CISW 350  Disaster Recovery  3 Units
Advisory: CIS 310  
Course Transferable to CSU  
Hours: 45 hours LEC, 27 hours LAB  
This course provides methods for identifying vulnerabilities and implementing countermeasures to prevent and mitigate failure risks in the information technology infrastructure for the business enterprise. Topics include disaster recovery, development of a disaster recovery plan, and development and implementation of disaster recovery policies and procedures.

CISW 360  Computer Forensics and Investigation  3 Units
Advisory: CISC 324, CISW 310, and CISW 350  
Course Transferable to CSU  
Hours: 45 hours LEC, 27 hours LAB  
This course introduces the methods used to conduct a computer forensics investigation. Topics include an overview of computer forensics as a profession, the computer investigation process, operating systems’ boot processes and disk structures, data acquisition and analysis, ethics, and a review of standard computer forensics tools. The course topics map to the objectives of the International Association of Computer Investigative Specialists (IACIS) certification.

CISW 370  Designing Accessible Web Sites  1 Unit
Prerequisite: CISW 300 with a grade of “C” or better  
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.

CISS 342  Implementing UNIX/Linux Operating System Security  3 Units
Prerequisite: CISS 310 with a grade of “C” or better.  
Course Transferable to CSU  
Hours: 45 hours LEC, 27 hours LAB  
This course presents in-depth explanations of the UNIX/Linux operating system security features as well as step-by-step configuration guides for proper operating system configuration. Topics include data and system integrity, authenticity, availability, and privacy of data.

CISS 350  Disaster Recovery  3 Units
Advisory: CISS 310  
Course Transferable to CSU  
Hours: 54 hours LEC  
This course provides methods for identifying vulnerabilities and implementing countermeasures to prevent and mitigate failure risks in the information technology infrastructure for the business enterprise. Topics include disaster recovery, development of a disaster recovery plan, and development and implementation of disaster recovery policies and procedures.

CISS 360  Computer Forensics and Investigation  3 Units
Advisory: CISC 324, CISS 310, and CISS 350  
Course Transferable to CSU  
Hours: 45 hours LEC, 27 hours LAB  
This course introduces the methods used to conduct a computer forensics investigation. Topics include an overview of computer forensics as a profession, the computer investigation process, operating systems’ boot processes and disk structures, data acquisition and analysis, ethics, and a review of standard computer forensics tools. The course topics map to the objectives of the International Association of Computer Investigative Specialists (IACIS) certification.

CISS 365  Interactive Multimedia Basics  3 Units
Prerequisite: CISS 350 and/or ARTNM 400  
Course Transferable to CSU  
Hours: 18 hours LEC, 18 hours LAB  
This course introduces the methods used to create simple vector-based graphics, animation, buttons and intuitive navigational elements, making background textures and images, understanding Web file formats, scanning, presenting to a client, and simple animation. May be taken twice for credit on a different platform or graphics software package. Not open to students who have completed ARTNM 400.

CISS 370  Designing Accessible Web Sites  1 Unit
Prerequisite: CISS 300 with a grade of “C” or better  
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 385  E-Commerce**  
3 Units  
Prerequisite: CISC 305 or CISW 300 with a grade of “C” or better.  
Course Transferable to CSU  
Hours: 54 hours LEC  
This course provides both the beginner and the professional with a working knowledge of e-commerce. It emphasizes the theory and practice of marketing in an electronic environment. The personalization and interactivity of commercial web sites as a tool to build strong customer relationships are stressed.

**CISW 400  Client-side Web Scripting**  
4 Units  
Prerequisite: CISW 300 with a grade of “C” or better  
Advisory: CISP 300 and CISW 310  
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 of 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 using a different client-side scripting language.

**CISW 405  ActionScript for Flash**  
3 Units  
Prerequisite: ARTNM 404 or CISW 365 with a grade of “C” or better.  
Advisory: CISP 300 or CISW 400.  
Course Transferable to CSU  
Hours: 36 hours LEC; 54 hours LAB  
This course introduces Macromedia Flash users to programming with ActionScript to animate, process data, and create dynamic content. It emphasizes the object-oriented capabilities of Macromedia Flash, and instructs 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 300 with a grade of “C” or better  
Course Transferable to CSU  
Hours: 54 hours LEC; 54 hours LAB  
This course emphasizes the creation of interactive web sites using a middleware scripting environment such as PHP or Active Server Pages (ASP). Topics include core features of the middleware scripting language, embedding server commands in HTML pages, control structures, functions, arrays, form validations, cookies, environmental variables, email applications, and database-driven web applications. This course may be taken twice using different middleware web scripting environment.

**CISW 411  Middleware Scripting Database Web Applications**  
2 Units  
Prerequisite: CISW 410 with a grade of “C” or better.  
Advisory: CISW 310.  
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 to streamline certain client side functions such as form validation are covered.

**CISW 420  Server-side Web Scripting**  
4 Units  
Prerequisite: CISW 300 with a grade of “C” or better  
Advisory: CISP 300 and CISW 310  
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 a Perl or Java. Topics include core features of the server-side web scripting language, control structures, functions, arrays, form validation, regular expressions, cookies, environmental variables, email applications, and database-driven web applications. This course may be taken twice using a different server-side web scripting language.

**CISW 442  Web Publishing with XML**  
3 Units  
Prerequisite: CISW 300 with a grade of “C” or better.  
Course Transferable to CSU  
Hours: 36 hours LEC; 54 hours LAB  
This course describes how to create well-formed and valid Extensible Markup Language (XML) documents, which are later used in conjunction with Extensible Style Sheet Language (XSL) to produce Web pages and other result documents. Topics include formatting XML documents with Cascading Style Sheets (CSS), Document Type Definitions (DTD), XML Namespaces and Schemas, XPath, and Extensible Style Sheet Language Transforms (XSLT).

**CISW 471  Interactive Multimedia Projects**  
4 Units  
Same As: ARTNM 410  
Prerequisite: ARTNM 402, ARTNM 404, CISW 300, CISW 310, or CISW 365 with a grade of “C” or better  
Advisory: ARTNM 328, CISW 410, and CISW 420  
Course Transferable to CSU  
Hours: 54 hours LEC; 54 hours LAB  
This course focuses on interactive multimedia project development. Emphasis is placed on the project development cycle including design specification, research, production, modification, and presentation. Projects assigned are multifaceted, approaching the complexity that individuals would be expected to encounter in the interactive multimedia development industry. This course is not open to students who have completed ARTNM 410.