Computer Information Science

Degree:
A.S. - Computer Science
A.S. - Computer Networking Management
A.S. - Database Management
A.S. - Microcomputer Applications
A.S. - PC Support Management
A.S. - Programming
A.S. - Security
A.A. - Technical Communication

Certificate:
Database
Networking
PC Support
Programming
Security

Computer science focuses on the many uses of computers in business and industry. Computers play an integral role in inventory control, payroll, customer service and tracking, networks and sales including support of web-based activities. At American River College, the Computer Information Science department offers many areas of study. These include both degree and certificate programs. The degree and certificate programs include programming, database management, web publishing/programming, networking, PC support and software applications. Our overall academic program includes lecture courses as well as combination lecture/laboratory courses to cover the techniques and skills required in this industry. Our Common Certificate Core developed with the help of local business leaders combined with specialized courses, provides students with the skills necessary to advance in many rapidly growing computer specialties. In each of our areas of study, students will acquire skills that can be used in both professional positions in business and industry and in advanced study at a four year institution. Students will gain a fundamental knowledge of computers using state-of-the-art equipment and the most current software available.

Career Opportunities

Our graduates can look forward to rewarding careers in programming, systems analysis, network administration, database administration, web publishing, web programming, help desk, microcomputer technical support and office management. General Education Graduation Requirements: In addition to completing the degree requirements, students must also complete the general education graduation requirements for an A.A./A.S. degree. See ARC graduation requirements.

Program Requirements

Computer Science A.S.
Requirements for Degree Major 34.5-38 units

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<thead>
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<td>CISP 430</td>
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Recommended Electives
CISC 310; CISP 310, 365, 370, 400, 409

Computer Networking Management
Requirements for Degree Major 41-45 units

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### Computer Information Science

#### CISCO Concentration Requirements

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<td>CISM 133</td>
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*and 5 units from the following:*
- CISA 340, 405; CISC 306; CISP 360, 400, 430; CISW 310, 350, 400

#### LINUX Concentration Requirements

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*and 5 units from the following:*
- CISA 340, 405; CISC 306; CISP 360, 400, 430; CISW 310, 350, 400

#### WINDOWS Concentration Requirements

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*and 5 units from the following:*
- CISA 340, 405; CISC 306; CISP 360, 400, 457; CISW 310, 350, 400

#### Requirements for CISCO Networking Certificate

**24 Units**
- CISC 310, 323, 324, 361; CISM 110, 111, 130, 131, 132, 133

#### Requirements for LINUX Networking Certificate

**22 Units**
- CISC 310, 323, 324, 361; CISM 110, 111, 119, 120, 121, 122

#### Requirements for WINDOWS Networking Certificate

**23 Units**
- CISC 310, 323, 361; CISM 100, 102, 105, 108, 110, 111

#### Database Management

**Requirements for Degree Major:**

**43-45 units**

#### Core Requirements

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#### Concentration Requirements

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<td>CISP 457</td>
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<tr>
<td>CISP 401 or CISP 430</td>
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#### Microcomputer Applications

The program will concentrate on the use of the microcomputer and current software to solve problems in the business environment. The training will include microcomputer applications in accounting, database, desktop publishing, electronic spreadsheets, graphics, operating systems, integrating software, telecommunications, word processing, and at least one programming language.

**Requirements for Degree Major:**

**36-37 units**

#### Core Requirements

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#### Concentration Requirements

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<td>CISP 325</td>
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<tr>
<td>CISP 450 or 457</td>
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*and two units selected from:*
- ACCT 341; CISA 321, 330, 340; CISC 350, 351

*and 3 units selected from:*
- CISP 320, 340, 350, 360, 365, 370

#### Recommended Electives

- ACCT 511, 545; BUS 310; CISA 331; CISC 300 (MAC)

#### PC Support Management

**Requirements for Degree Major:**

**38-40 units**

#### Core Requirements

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#### Concentration Requirements

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<td>CISC 350</td>
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</table>
### Computer Information Science

#### Requirements for Certificate: 24 units

- BUS 310; CISA 305, 315, 320; CISC 305, 306 or 321, 310, 320 (Windows), 350, 361, 362, 363; CISN 110

#### Programming

**Requirements for Degree Major** 35-38 units

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<td>CISP 400</td>
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<td>CISP 409</td>
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**Recommended Electives**

- ACCT 311; BUS 105 CISA 305, 315, 320, 340; CISC 320, 350; CISN 340; MGMT 300, 362; SPEECH 301 or 331

#### Requirements for Certificate: 22 units

- BUS 310
- CISC 310, 320; CISP 360, 430, and CISP 450 or CISP 457
  - and a minimum of 4 units from the following:
    - CISP 310, 317, 319, 320, 350, 365, 370, 400, 409

#### Technical Communication

**Requirements for Degree Major** 42.5 units

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#### Database

**Requirements for Certificate** 21 units

- BUS 310; CISA 315, 316, 320, 321; CISC 320; CISP 350, 370 and one of the following:
  - CISP 450 or CISP 457

#### Software Applications

**Requirements for Certificate** 25 units

- BUS 310
- CISC 300, 305, 306, 310, 320 (Windows), 350

#### Web Programming

**Requirements for Certificate** 35 units

- BUS 310
- CISC 410
- CISC 420 (Win)
- CISC 325
- CISC 324
- CISW 350 (Oracle)
- CISP 360
- CISP 409 (Java)
- CISW 300/INDIS 410
- CISW 370
- CISW 470 or ARTNM 406
  - One course from:
    - CISW 310 or CISW 400
    - CISW 310 or CISW 320
  - One course from:
    - CISW 400 or CISW 420

American River College 2004-2005
## CIS - Applications

### CISA 160 Project Management Techniques and Software (Same as MGMT 142) 3 Units

**Requirements for Certificate:** 20 units

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<td>Art New Media 402 or CIS 470 or ARTNM 406</td>
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<td>CIS 350 or ARTNM 400</td>
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Prerequisite: None
Advisory: None

This is an introductory course covering the responsibilities of a project manager. It includes the knowledge needed to manage a project, control costs and schedule resources. It will also introduce the use of project management software to track project resources, tasks and milestones. Not open to students who have taken Management 142.

### CISA 294 Topics in Computer Information Science - Applications 5-5 Units

**Requirements for Certificate:** 20 units

<table>
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<td>CISA 294</td>
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Prerequisite: To be determined with each topic.

Hours: 0-90 hours LEC; 0-135 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.

### CISA 305 Beginning Word Processing 2 Units

Formerly: CISA 300
Prerequisite: None
Advisory: CIS 300.
Course Transferable to CSU

This is an introductory course in word processing. The 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. AA/AS area D2.

### CISA 306 Intermediate Word Processing 2 Units

Formerly: CISA 301
Prerequisite: CISA 305 with grade of "C" or better.
Course Transferable to CSU

This course is a continuation of word processing with emphasis on applications for business documents and reports. In addition, this course includes desktop publishing techniques using word processing software, newsletter production, macro editing, complex document styles and commands, importing, linking and merging data from other applications into a word processing document. This course may be taken four times on a different software packaging or version.

### CISA 315 Introduction to Electronic Spreadsheets 2 Units

Formerly: CISA 310
Prerequisite: None
Advisory: CISC 100 and the ability to touch type.
Course Transferable to CSU

Hours: 27 hours LEC; 27 hours LAB

This course introduces the use of electronic spreadsheet programs. The course includes designing spreadsheets, developing formulas for automatic calculations, developing "what if" models, and producing printed reports. In addition, the course will introduce 3-D cell referencing, accessing real-time spreadsheet data from the Internet, and data filtering techniques. The course may be taken four times for credit on a different software package or version. AA/AS area D2.

### CISA 316 Intermediate Electronic Spreadsheets 2 Units

Formerly: CISA 311
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 spreadsheets 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, the 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 320 Introduction to Database Management 1 Unit

Formerly: CISA 13A
Prerequisite: None
Advisory: CISC 300 and BUSTEC 300.
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, accessing, searching, updating files, and designing and producing printed reports. The course may be taken four times on a different software package or version. AA/AS area D2.

### CISA 321 Intermediate Database Management 1 Unit

Formerly: CISA 13B
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

Formerly: CISA 13C
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 on a different software package or version.

### CISA 330 Desktop Publishing 2 Units

Formerly: CISA 17A
Prerequisite: None
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. The course may be taken four times for credit on a different software package or version.

### CISA 331 Intermediate Desktop Publishing 2 Units

Formerly: CISA 17B
Prerequisite: CISA 330 with a grade of "C" or better.
Course Transferable to CSU

Hours: 27 hours LEC; 27 hours LAB

This course continues the study 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. The course may be taken four times for credit on a different software package or version.

### Computer Information Science

**Requirements for Certificate:** 20 units

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>CISA 294</td>
<td>5-5</td>
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<tr>
<td>CISA 305</td>
<td>2</td>
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<td>CISA 306</td>
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<td>CISA 315</td>
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<td>CISA 316</td>
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<td>CISA 320</td>
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<td>2</td>
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<td>CISA 331</td>
<td>2</td>
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</tbody>
</table>

This course is a continuation of electronic spreadsheets 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, the 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.

This course is an introductory course in word processing. The 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. AA/AS area D2.

This course introduces the student, through hands-on operation, to the use of database management programs on the microcomputer. It includes designing a database, accessing, searching, updating files, and designing and producing printed reports. The course may be taken four times on a different software package or version. AA/AS area D2.

This 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. The course may be taken four times for credit on a different software package or version.
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 335 Introduction to Adobe FrameMaker** 2 Units

Formerly: CIS 19A
Prerequisite: CISC 300.
Advisory: RUSTIC 300.
Course Transferable to CSU
Hours: 27 hours LEC; 27 hours LAB

This course is designed to introduce Adobe FrameMaker as a desktop publishing tool. Topics include creating, editing, and saving custom FrameMaker documents; defining elements of book and page layout/design; using templates to quickly start projects; incorporating graphics and tables; learning timesaving tips and shortcuts; producing output (hard copy and PDF); and using options to enhance new skills.

**CISA 336 Advanced Adobe FrameMaker** 2 Units

Formerly: CIS 19B
Prerequisite: CISA 335.
Course Transferable to CSU
Hours: 27 hours LEC; 27 hours LAB

This course builds upon previous training in using Adobe FrameMaker, the desktop publishing tool for print and online book publishing. The focus of this course is FrameMaker's advanced functions that can enhance document presentation and automate complex and otherwise time-consuming tasks. Topics include advanced page layout/design; generating/formatting a book file, table of contents, and index; creating index entries; using advanced, automated functions, such as cross-references, hypertext links, and conditional text; and designing documents for single source output and Web-ready formats.

**CISA 340 Presentation Graphics** 2 Units

Prerequisite: None
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 elements of good presentation 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.

**CISA 405 Scripting for Applications** 3 Units

Formerly: CIS 36
Prerequisite: None
Course Transferable to CSU
Hours: 36 hours LEC; 54 hours LAB

This course is an introduction to the application scripting via object oriented programming concepts. Topics covered include the OS environment; office suites; scripting languages; user interface; creating application macros and scripts; using application objects; properties and methods; customizing applications; linking application data; buttons; boxes; graphics; data handling; error handling; control; and form handling. This course may be taken four times with a different scripting language.

**CISC 294 Topics in Computer Information Science - Core** .5-5 Units

Formerly: CIS 93
Prerequisite: To be determined with each topic.
Hours: 0-90 hours LEC; 0-135 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

Formerly: CIS 1
Prerequisite: None
Advisory: ENGRD 116 or ESLR 320 and ability to keyboard 20 WAM.
Course Transferable to CSU
Hours: 18 hours LEC

This introductory course provides a general non-technical knowledge on how computers work and basic computer terminology and concepts. The focus is hands-on instruction using an operating system, word processing, spreadsheet, and Internet software. The course may be taken twice for credit on a different hardware platform. AA/AS area D2

**CISC 303 Computer Skills for Educators** 3 Units

Formerly: CIS 4
Prerequisite: None
Course Transferable to CSU
Hours: 45 hours LEC; 27 hours LAB

This course is for educators to acquire knowledge of hardware and software that will facilitate the preparation of instructional materials, record keeping, access supplementary materials and resources, facilitate management of equipment and laboratory materials, and make powerful presentations. Operating system, word processing, spreadsheet, database, presentation graphics, utilities, and Internet software, as well as review various types of instructional software will be used.

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

Formerly: CIS 21A
Prerequisite: None
Advisory: CISC 300.
Course Transferable to CSU
Hours: 18 hours LEC; 18 hours LAB

This course is an introduction to how the Internet works, how to connect, and how to use the basic services. Topics will include E-mail, the World Wide Web, newsgroups, mailing lists, Telnet, and FTP.

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

Formerly: CIS 21B
Prerequisite: None
Advisory: CISC 305.
Course Transferable to CSU
Hours: 18 hours LEC; 18 hours LAB

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. May be taken four times for credit on a different software package or version.

**CISC 309 Applied Applications Lab** .5 Unit

Prerequisite: None
Corequisite: CISC 300, CISA 305, CISA 306, CISA 315, CISA 316, or CISA 320.
Advisory: ENGRD 116 or ESLR 320 and ability to keyboard 20 WAM.
Course Transferable to CSU
Hours: 27 hours LAB

This course complements 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.

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

Formerly: CIS 3
Prerequisite: None
Advisory: ENGRD 116 or ESLR 320.
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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISC 320</td>
<td>Operating Systems</td>
<td>1</td>
<td>This course introduces students to operating systems for the IBM and IBM compatible microcomputer. It includes lecture and hands-on application of operating system concepts, program management, file/directory organization, printer control, and procedures for installation of software. This course may be taken four times on a different operating system or version.</td>
</tr>
<tr>
<td>CISC 321</td>
<td>Intermediate Operating Systems</td>
<td>1</td>
<td>The content covers the study of advanced commands, effective utility use, advanced batch files/script files, program logic, disk organization, making user-friendly systems, and anticipating and preventing system problems. This course may be taken four times on a different operating system.</td>
</tr>
<tr>
<td>CISC 322</td>
<td>Linux Operating System</td>
<td>1</td>
<td>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.</td>
</tr>
<tr>
<td>CISC 323</td>
<td>Intermediate Linux Operating System</td>
<td>1</td>
<td>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.</td>
</tr>
<tr>
<td>CISC 324</td>
<td>Introduction to Data Communications</td>
<td>1</td>
<td>This course introduces business data communication concepts, systems, technology, protocols, theory, and basic terminology. Specific topics include analog and digital data encoding and transmission, media, interfaces, packet, circuit and broadcast networks, and data multiplexing.</td>
</tr>
<tr>
<td>CISC 350</td>
<td>Introduction to Local Area Networks</td>
<td>1</td>
<td>This course introduces local area networks and provides hands-on training in LAN applications and network administration. Topics include planning, installing, and maintaining a LAN, responsibilities of the system administrator, and human implications. The course may be taken four times on a different operating system.</td>
</tr>
<tr>
<td>CISC 361</td>
<td>Microcomputer Support And Repair</td>
<td>1</td>
<td>This course provides a foundation to study for and pass the A+ certification. It includes training to troubleshoot hardware to a field replaceable component. Desktop operating system installation and simple networking will be covered. It provides a firm grounding in the hardware that runs the supported software and helps in distinguishing hardware from software problems. This course provides a foundation to study for and pass the A+ certification.</td>
</tr>
<tr>
<td>CISC 362</td>
<td>Microcomputer and Applications Support</td>
<td>2</td>
<td>This course is an internship in the ARC computer labs. It introduces customer service and problem solving skills needed for success in a small or large business environment. It also provides work experience in computer hardware and software support in a “help desk” environment.</td>
</tr>
<tr>
<td>CISC 363</td>
<td>Advanced Microcomputer Support And Repair</td>
<td>2</td>
<td>This course provides a foundation in networking and PC support. Hands-on skills taught will include networking basics, SCSI, advanced components installation and configuration, troubleshooting hardware, personal computer support, and repair training to configure and troubleshoot major operating systems and networking hardware. This course is preparation for the A+ Certification exam.</td>
</tr>
<tr>
<td>CISC 496</td>
<td>Teaching Assistant in Computer Information Science</td>
<td>1-4</td>
<td>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.</td>
</tr>
<tr>
<td>CISC 497</td>
<td>Work Experience in Computer Information Science</td>
<td>1-4</td>
<td>This course provides for those who want to develop an in-depth understanding of computer software and who want to learn to work with individual students or small groups in a problem-solving environment. May be taken twice for credit up to a maximum of six units.</td>
</tr>
</tbody>
</table>

**CIS - Network**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Units</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CISN 100</td>
<td>Network Systems Administration</td>
<td>3</td>
<td>This course covers the administration of a server in a client/server network. Topics covered include designing a basic network, installing and configuring network shares, setting up and managing network printers, backing up servers, and helping to troubleshoot hardware problems.</td>
</tr>
</tbody>
</table>

**Course Transferable to CSU**

**Advisory**

1. CISC 300 and ability to touch type.
2. One course in programming is highly recommended.
3. Successful completion of course in which the student wishes to tutor.
4. Must be enrolled in a minimum of 7 units including work experience.
5. Either CISC 310, CISC 320 (Windows), CISC 320 (UNIX), and either CISC 350 and CISC 351, or CISN 110 and CISN 111 with a grade of “C” or better.
monitoring and troubleshooting network resources, and establishing policies and procedures for networking operations. May be taken three times for credit on a different software version.

**CISN 102  Intermediate Network Systems Administration**  
**3 Units**  

Formerly: CIS 81  
Prerequisite: CISN 100 with a grade of “C” or better.  
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, managing applications; managing connectivity for different network and client operating systems, managing remote servers. May be taken three times for credit on a different software version.

**CISN 105  Active Directory Services**  
**3 Units**  

Formerly: CIS 82  
Prerequisite: CISN 102 with a grade of “C” or better.  
Hours: 45 hours LEC; 27 hours LAB  
This course covers installing, configuring, and administering Microsoft Windows Active Directory services. The course also focuses on implementing Group Policy and understanding the Group Policy tasks required to centrally manage users and computers. Group Policies will be used to configure and manage the user desktop environment, configure and manage software, and implement and manage security settings. May be taken three times for credit on a different software version.

**CISN 109  Administering Network Infrastructure**  
**3 Units**  

Formerly: CIS 84  
Prerequisite: CISN 102 with a grade of “C” or better.  
Hours: 45 hours LEC; 27 hours LAB  
This course covers installing, configuring, managing, and supporting a network infrastructure that uses the Microsoft Windows Server products. The course focuses on TCP/IP and related services, including DHCP Server service, DNS Server service, WINS, network security protocols, Public Key Infrastructure (PKI), Internet Protocol Security (IPSec), and remote access. The course also covers configuring Windows as a network router, configuring Internet access for a network, configuring a Web server, and managing a Windows deployment using Remote Installation Services (RIS). May be taken three times for credit on a different software version.

**CISN 110  Networking Technologies - Preparation for N+ Certification**  
**2 Units**  

Formerly: CIS 63A  
Prerequisite: None  
Corequisite: CISC 350.  
Advisory: CISC 361.  
Hours: 27 hours LEC; 27 hours LAB  
This course is an introductory, hands-on course in networking software and hardware. Topics covered include modems, communication protocols, local and wide area networks, intranet and inter networks, network architectures, topologies, and the Open Systems Interconnect (OSI) model. CISN 110 and CISN 111 are preparation for industry N+ certification test.

**CISN 111  Intermediate Networking Technologies - Preparation for N+ Certification**  
**2 Units**  

Formerly: CIS 63B  
Prerequisite: CISN 110 with a grade of “C” or better.  
Advisory: CISC 361.  
Hours: 27 hours LEC; 27 hours LAB  
This course is an intermediate, hands-on course in networking software and hardware. Topics covered will include network operating systems setup, analyzing network performance, diagnosing, repairing of network problems, and network security techniques. CISN 110 and CISN 111 are preparation for industry N+ certification test.

**CISN 119  TCP/IP Protocols**  
**3 Units**  

Prerequisite: None  
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 120  Beginning Network Administration with Linux**  
**3 Units**  

Formerly: CISN 103  
Prerequisite: CISC 323 with a grade of “C” or better.  
Advisory: One programming language is recommended.  
Hours: 45 hours LEC; 27 hours LAB  
This course covers the basics of installation and administration of the Linux Network Operating System. Topics include the following: connecting to a network, utilizing network utilities; planning, accessing, and managing file systems; planning and implementing login and file system security; administering and maintaining the user and printer environment; protecting network data; and installing network applications.

**CISN 121  Intermediate Network Administration with Linux**  
**2 Units**  

Formerly: CISN 115  
Prerequisite: CISN 120 with a grade of “C” or better.  
Hours: 27 hours LEC; 27 hours LAB  
This is the second in a series of three courses in Linux Network Administration. Topics include the following: monitoring system events, setting up and configuring Apache Web Server, and setting up and configuring My SQL server.

**CISN 122  Advanced Network Administration with Linux**  
**2 Units**  

Formerly: CISN 117  
Prerequisite: CISN 121 with a grade of “C” or better.  
Hours: 27 hours LEC; 27 hours LAB  
This is the third in a series of three courses in Linux Network Administration. Topics include the following: installing and configuring network servers, clients, and print servers; creating system security; creating workgroups and accounts; and upgrading systems.

**CISN 130  Data Communication and Networking Fundamentals**  
**3 Units**  

Formerly: CIS 79A  
Prerequisite: None  
Advisory: CISC 320, and CISC 300 or 310.  
Hours: 54 hours LEC; 18 hours LAB  
This course is an introduction to data communication and networking fundamentals. It 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 analysis. This is the first course in preparation for Cisco CCNA certification examination.

**CISN 131  Networking Theory and Routing Technologies**  
**3 Units**  

Formerly: CIS 79B  
Prerequisite: CISN 130.  
Hours: 54 hours LEC; 18 hours LAB  
This course is an introduction to networking theory and routing technologies, including the main Cisco Internet operating system, beginning router configurations, routed and routing protocols. This is the second course in preparation for Cisco CCNA certification examination.

**CISN 132  Advanced Routing and Switching**  
**3 Units**  

Formerly: CIS 79C  
Prerequisite: CISN 131.  
Hours: 54 hours LEC; 18 hours LAB
This course is an introduction to advanced routing and switching technologies. Topics covered 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.

CISN 133 Wide-Area Networks and Project-Based Learning 3 Units
Formerly: CIS 79D
Prerequisite: CISN 132.
Hours: 54 hours LEC, 18 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.

CISN 170 Web Server Administration 3 Units
Formerly: CIS 86
Prerequisite: CISN 108.
Hours: 45 hours LEC, 27 hours LAB
This course covers web server installation and administration for the Internet and intranets. Topics covered 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 174 Messaging Server Administration Using Exchange Server 3 Units
Formerly: CIS 87
Prerequisite: CISN 102 with a grade of "C" or better.
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. May be taken 3 times for credit on a different software version.

CISN 190 Client Operating Systems 2 Units
Formerly: CIS 89
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 200 Designing Windows 2000 Network Security 3 Units
Formerly: CIS 94
Prerequisite: CISN 102 with a grade of "C" or better.
Advisory: CISN 105 and 108.
Hours: 45 hours LEC, 27 hours LAB
This course is an introduction to designing and implementation of network strategy in an enterprise network environment. Topics include user authentication, encryption, internal and external risks, Trojans, worms, and viruses. Types of hardware and software attacks on networks, use and configuration of firewalls, file system security, logging, and auditing will be examined. It also covers security consideration for Windows 2000 servers, administrative tools, security tools, security between LAN’s and WAN’s, and security policy management.

CISN 202 Internet Security and Acceleration Server 3 Units
Formerly: CIS 95
Prerequisite: CISN 105, 108 with a grade of "C" or better.
Advisory: CISN 200.
Hours: 45 hours LEC, 27 hours LAB
This course covers the design and implementation of a secure firewall between internal Windows 2000 network and the Internet. Topics covered are planning, installation, setup, configuration, troubleshooting and deploying of ISA server 2000.

CISN 377 Installing and Administering SQL Server 3 Units
Formerly: CIS 85
Prerequisite: CISN 102 with a grade of "C" or better.
Course Transferable to CSU
Hours: 45 hours LEC, 27 hours LAB
This course provides the knowledge and technical skills required to install, configure, administer, and troubleshoot the client/server database management system of Microsoft SQL Server. Content includes learning 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. May be taken three times on a different software version.

CISP 300 Algorithm Design/Problem Solving 3 Units
Formerly: CIS 41
Prerequisite: None
Advisory: CISP 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 310 Assembly Language Programming for Microcomputers 4 Units
Formerly: CIS 35A
Prerequisite: A grade of "C" or better in one of the following: CISP 300, 320, 340, 365, 370.
Course Transferable to UC/CSU
Hours: 54 hours LEC, 54 hours LAB
This course is an introduction to the architecture of microcomputers that use the Intel microprocessor. Topics include machine and assembly language, keyboard and screen manipulation, binary and BCD arithmetic, ASCII and binary conversion, table processing, macros, and subroutines. Machines language programs will be traced as an aid to debugging.

CISP 317 Computer Organization and Assembly Language Programming 4 Units
Formerly: CIS 34
Prerequisite: None
Advisory: CISP 300 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 internal organization of a computer. Topics include learning to program in assembly language, implementing high level logic such as loops and subroutines, and performing low level hardware access. AAAS area D2

CISP 319 Advanced Assembly Programming 4 Units
Formerly: CIS 35
Prerequisite: CISP 317 with a grade of "C" or better.
Course Transferable to UC/CSU
Hours: 54 hours LEC, 54 hours LAB
This course is an extension of the language and techniques studied in CISP 317. Topics include stacks, call frames, arrays and structures in assembly language. Hardware related topics such as interrupts, preemption and multitasking are also introduced.
CISP 320  COBOL Programming  4 Units
Formerly: CIS 36A
Prerequisite: CISP 300 or one of the following: CISP 340, 365, or 370.
Course Transferable to UC/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 include programming structure, topdown design, and modular programming techniques. Topics covered include report formatting, control breaks, and single and double arrays. AA/AS area D2

CISP 321  Advanced COBOL Programming  4 Units
Formerly: CIS 36B
Prerequisite: CISP 320 with a grade of “C” or better.
Course Transferable to UC/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 disk 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 340  FORTRAN Programming  3 Units
Formerly: CIS 33
Prerequisite: None
Advisory: CISC 310, CISP 300, and MATH 120.
Course Transferable to UC/CSU
Hours: 56 hours LEC; 54 hours LAB
This course is an introduction to the computer solution of problems by programming in FORTRAN. The emphasis is on learning the language and structured programming techniques. While problems from many disciplines will be presented, emphasis is placed on solving problems in engineering and the physical sciences. Appropriate for all majors in engineering, science and mathematics. (CAN CSCI 4) AA/AS area D2

CISP 350  Database Programming  3 Units
Formerly: CIS 37
Prerequisite: None
Advisory: CISC 310, CISA 320, CISA 321, and CISP 300.
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. AA/AS area D2.

CISP 360  Introduction to Structured Programming  4 Units
Formerly: CIS 32A
Prerequisite: A grade of “C” or better in one of the following: CISP 300, 320, 340, 365, 370.
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to structured programming and objects. Topics include Top-down, variables, control flow, constants, libraries, arrays, functions, arguments, input/output, classes and objects. AA/AS area D2.

CISP 365  Structured Programming with PASCAL  4 Units
Formerly: CIS 31
Prerequisite: None
Advisory: CISC 310, CISP 300, MATH 120.
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to PASCAL, a language which emphasizes the concepts of structured programming. Topics include topdown design, output-input, data types, control structures, functions and procedures. Students will design, code test, and run PASCAL programs. (CAN CSCI 12)

CISP 370  Beginning Visual Basic  4 Units
Prerequisite: None
Advisory: CISC 310 and CISP 300.
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.

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
Formerly: CIS 32B
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. Topics include operation, encapsulation and overloading, classes, inheritance and virtual functions. (CAN CSCI 18) AA/AS area D2

CISP 401  Object Oriented Programming with Java  4 Units
Formerly: CIS 409
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 object oriented programming using the Java programming language. Topics include: objects, inheritance, polymorphism, interfaces, abstract classes, inner classes, error handling, graphical user interfaces, applets, threads, files, databases, and packages.

CISP 430  Data Structures  4 Units
Formerly: CIS 40
Prerequisite: CISP 365 or CISP 400 (C or C++).
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB
This course uses a case study approach applying techniques for systematic problem analysis, program specification, design, coding, testing, debugging and documentation of large programs. The course uses advanced language features such as strings, sets, non-text files, pointers and recursion. Elementary abstract data structures, and selected searching and sorting techniques are also covered. (CAN CSCI 24)

CISP 440  Discrete Structures for Computer Science  3 Units
Formerly: CIS 44
Prerequisite: MATH 370 with a grade of “C” or better.
Corequisite: CISP 430.
This course is an introduction to 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, combinatorial circuits, and computer arithmetic. AA/AS area D2; CSU area B3.

**CISP 450  System Development for Microcomputers  3 Units**
Formerly: CIS 20
Prerequisite: CISA 300, CISA 310, CISA 320, and one programming language.
Course Transferable to CSU
Hours: 54 hours LEC
This course covers computer system design using structured analysis, automated analysis and design tools, and prototyping to develop system/software evaluation tools and recommendations.

**CISP 457  Computer Systems Analysis and Design  3 Units**
Prerequisite: CISC 310 and one of the following: CISP 317, CISP 319, CISP 320, CISP 340, CISP 360, CISP 365, or CISP 370.
Advisory: CISA 305 and CISA 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.

**CISW 300  Web Publishing (Same as Interdisciplinary Studies 410)  3 Units**
Formerly: CIS 22
Prerequisite: None
Advisory: CISC 300 and CISC 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 WWW 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. This course prepares apprentice web designers and publishers to identify the information dissemination needs of a client, design an appropriate WWW solution, and implement it. Not open to those students who have taken INDIS 410.

**CISW 310  Advanced Web Publishing  4 Units**
Formerly: CIS 23
Prerequisite: CISW 300.
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, dynamics HTML, forms, client-side programming with JavaScript, CGI scripting with Perl, and web-database interactivity.

**CISW 350  Imaging for the Web (Same as ARTNM 400)  1 Unit**
Prerequisite: None
Advisory: CISW 300 or CISC 306.
Course Transferable to CSU
Hours: 18 hours LEC, 18 hours LAB
This course takes an in-depth look at designing graphics for the Web. 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, presenting to a client, and simple animation. May be taken twice for credit on a different platform or graphics software package. Not open to those students who have taken ARTNM 400.

**CISW 370  Designing Accessible Web Sites  1 Unit**
Formerly: CIS 22D
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.

**CISW 400  Client-side Web Scripting  4 Units**
Formerly: CIS 25A
Prerequisite: CISW 300 with a grade of "C" or better.
Advisory: CISW 310 and CISP 300.
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. May be taken twice on a different client-side scripting language.

**CISW 410  Middleware Web Scripting  4 Units**
Formerly: CIS 25B
Prerequisite: CISW 300 with a grade of "C" or better.
Advisory: CISW 310 and CISP 300.
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 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. May be taken twice on a different middleware scripting environment.

**CISW 420  Server-side Web Scripting  4 Units**
Formerly: CIS 25C
Prerequisite: CISW 300 with a grade of "C" or better.
Advisory: CISW 310 and CISP 300.
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 scripting language, control structures, functions, arrays, form validation, regular expressions, cookies, environmental variables, email applications, and database-driven web applications. May be taken twice on a different server-side scripting language.

**CISW 470  Web Team Projects (Same as Art New Media 406)  3 Units**
Formerly: CIS 28
Prerequisite: CISW 300, or CISW 310, or ARTNM 402 with a grade of “C” or better.
Course Transferable to CSU
Hours: 36 hours LEC, 54 hours LAB
This course focuses on web development in a team setting. Emphasis will be placed on the project development cycle including design specification, research, production, modification, and presentation. Web projects assigned in the class will be multifaceted, approaching the complexity that individuals would be expected to encounter in the web development industry. Not open to students who have completed ARTNM 406.