

# 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.A. - Technical Communication

## Area:

Computer Science  
 & Information Technology

## Dean:

Barbara Blanchard

## Phone:

(916) 484-8361

## Counseling:

(916) 484-8572

## Certificate:

Database Certificate  
 Networking Certificate  
 PC Support Certificate  
 Programming Certificate  
 Software Applications Certificate  
 Technical Communication  
 Web Programming Certificate  
 Web Publishing Certificate

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.

## COMPUTER SCIENCE A.S.

**Requirements for Degree Major:** **38-41 units**

<b>Business Core Requirements</b>	<b>Units</b>
CISP 300	3
CISP 310 or 319	4
CISP 360	4
CISP 430	4
CISP 440	3
MATH 400	5
MATH 401	5
<i>One course from the following:</i>	
MATH 410 or MATH 420	3/4
PHYS 410	4
<i>One course from the following:</i>	
BIOL 410	5
BIOL 420	5
BIOL 430 or 431	5
CHEM 400	5
ENGR 401	3
ENGR 413	3

## Recommended Electives

CISC 310; CISP 310, 365, 370, 400, 409

## Computer Networking Management

**Requirements for Degree Major:** **38-40 units**

<b>Business Core Requirements</b>	<b>17-19 Units</b>
ACCT 101 or 301	3/4
BUS 110 or ECON 302	3
BUS 300	3
BUS 310 or ENGWR 300	3
BUS 340	3
BUSTEC 300 (or passing of a keyboarding competency test)	0/1
CISA 300	1
CISA 310	1

**Concentration Requirements** **21 Units**

CISC 310	3
CISC 320	1
CISC 350	1
CISC 361	3
CISN 100	2
CISN 102	3
CISN 105	3
<i>Five units from the following:</i>	
CISA 340	4
CISC 306	4
CISP 360	1
CISP 400	1
CISP 430	4

**Computer Networking Certificate**

**Requirements for Certificate:** **21 units**

BUS 310; CISC 310, 320 (Unix), 350, 351, 361; CISN 100, 102, 105

**Database Management**

**Requirements for Degree Major:** **41-43 units**

**Core Requirements** **17-19 Units**

ACCT 101 or 301	3/4
BUS 110 or ECON 302	3
BUS 300	3
BUS 310 or ENGWR 300	3
BUS 340	3
BUSTEC 300 (or passing of keyboarding competency test)	0/1
CISA 300	1
CISA 310	1

**Concentration Requirements** **24 Units**

CISA 320	1
CISC 300	3
CISC 320	1
CISC 321	1
CISP 317	4
CISP 350	3
CISP 365	4
CISP 457	3
<i>Four units from the following:</i>	
CISP 409 or CISP 430	4

**Database Certificate**

**Requirements for Certificate:** **21 units**

BUS 310; CISA 310, 311, 320, 321; CISC 320; CISP 350, 370  
and one of the following:  
CISP 450 or CISP 457

**PC Support Management**

**Requirements for Degree Major:** **39-42 units**

**Business Core Requirements** **17-19 units**

ACCT 101 or 301	3/4
BUSTEC 300 or passing of a Keyboarding competency test)	1-0
BUS 310 or ENGWR 300	3

BUS 340	3
BUS 300	3
BUS 110 or ECON 302	3
CISA 300	1
CISA 310	1

**Concentration Requirements** **22-23 Units**

CISC 300	3
CISA 320	1
CISC 320	1
CISA 340	1
CISC 350	1
CISC 351	1
CISC 305	1
CISC 306	1
CISC 361	3
CISC 362	2
CISP 365	4

*One course chosen from the following:*  
CISP 310, 317, 319, 320, 340, 360, 370, 400, 409

**PC Support Certificate**

**Requirements for Certificate:** **19 units**

BUS 310; CISA 300, 310, 320; CISC 305, 310, 320(Win), 350, 351, 361, 362  
*Choose one of the following:*  
CISA 340, CISC 306

**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:** **33-35 units**

**Business Core Requirements** **16-17 Units**

ACCT 301	4
BUS 110 or ECON 302	3
BUS 300	3
BUS 340	3
BUSTEC 300 or keyboarding competency	1-0
CISC 310	3

**Concentration Requirements** **17-18 Units**

CISA 300	1
CISA 301	1
CISA 302	1
CISA 310	1
CISA 311	1
CISA 320	1
CISC 300 (PC)	1
CISC 320 (UNIX)	1
CISC 320 (WINDOWS)	1
CISP 450	3

Two units selected from:  
ACCT 341; CISA 321, 330, 340; CISC 350, 351 2  
One course selected from:  
CISP 320, 340, 350, 360, 365, 370 3-4

**Recommended Electives**

ACCT 311, 343; BUS 310; CISA 331; CISC 300 (MAC)

**Software Applications Certificate**

**Requirements for Certificate: 21 units**

BUS 310  
CISA 300, 301, 302, 310, 311, 320, 321, 330, 340  
CISC 300, 305, 306, 310, 320, 350

**Programming**

**Requirements for Degree Major: 35-37 units**

**Business Core Requirements 16-17 Units**

ACCT 301 4  
BUS 110 or ECON 302 3  
BUS 300 3  
BUS 340 3  
BUSTEC 300 or keyboarding competency 1-0  
CISC 300 3

**Concentration Requirements 19-20 Units**

CISC 300 (PC) 1  
CISP 310 or CISP 317 or CISP 319 4  
CISP 430 or CISP 457 3  
*One class selected from:*  
CISP 320, 360 4  
*Two classes selected from:*  
CISP 321, 350, 365, 370, 400, 409 7-8

**Recommended Electives**

ACCT 311; BUS 105 CISA 300, 310, 320, 340; CISC 320, 350; CISP 340; MGMT 300, 362; SPEECH 301 or 331

**General Education Graduation Requirements:** Students must also complete the general education graduation requirements for an A.A. degree. See Graduation requirements.

**Programming Certificate**

**Requirements for Certificate: 22 units**

BUS 310 3  
CISC 310, 320; CISP 360, 430, and CISP 450 or CISP 457 15  
*and a minimum of 4 units from the following:* 4  
CISP 310, 317, 319, 320, 350, 365, 370, 400, 409

**Web Programming Certificate**

**Requirements for Certificate: 35 units**

BUS 310 3  
CISC 310 3  
CISC 320 (Win) 1  
CISC 320 (Unix) 1  
CISC 321 (Unix) 1  
CISW 300 or INDIS 410 3  
CISW 370 1  
CISP 350 (Oracle) 3  
CISP 360 4  
CISP 409 (Java) 4  
CISW 470 3  
*One course from:*  
CISW 310 or CISW 400 4  
*One course from:*  
CISW 410 or CISW 420 4

**Web Publishing Certificate**

**Requirements for Certificate: 20 units**

BUS 310 3  
CISC 310 3  
CISC 320 (Win) 1  
CISC 320 (Unix) 1  
CISW 300/INDIS 410 3  
CISW 310 4  
CISW 370 1  
*One course from:*  
Art New Media 402 3  
CISW 470/ARTNM 406 3  
*One course from:*  
CISW 350/ARTNM 400 1

**Technical Communication**

**Requirements for Degree Major: 42 units**

**Core Requirements Units**

ART 320 3  
ART 323 3  
ARTNM 350 3  
CISA 300 1  
CISA 301 1  
CISA 302 1  
CISC 320 1  
CISW 300 or INDIS 410 3  
ENGWR 342 3  
ENGWR 352 3  
*and 1.5 units selected from:*  
ENGWR 344 1.5  
ENGWR 348 1.5  
ENGWR 350 1.5

**Concentration Requirements Units**

*Twelve units selected from:*  
ARTNM 324 3  
ARTNM 328 3  
ARTNM 330 3  
ARTNM 352 or  
CISA 330 and CISA 331 or  
CISA 335 and CISA 336 4  
ARTNM 354 3  
ARTNM 404 3  
ARTNM 402 3  
CISA 310 1  
CISA 340 1  
CISW 310 4  
*Six units selected from:*  
ENGW 450 3  
ENGW 451 3  
ENGWR 330 3  
ENGWR 331 3  
ENGWR 354 1  
ENGWR 356 1  
ENGWR 358 1  
JOUR 300 3  
JOUR 401 2  
SPEECH 321 or 331 3

**Requirements for Certificate: 19.5 units**

Courses Required	Units
ARTNM 352 or CISA 330 and CISA 331 or CISA 335 and CISA 336	3 4 4
CISA 300	1
CISA 301	1
CISA 302	1
ENGWR 342	3
ENGWR 352	3
and 1.5 units selected from:	
ENGWR 344	1.5
ENGWR 348	1.5
ENGWR 350	1.5
and 6 units selected from:	
ARTNM 324	3
ARTNM 328	3
ARTNM 330	3
ARTNM 402	3
ARTNM 404	3
CISA 340	1
CISW 300	3
CISW 310	4

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course builds upon previous training in the study of word processing with emphasis on macro programming, complex style commands, importing data from non-word processing applications, linking word processing files with other applications and using Desktop Publishing concepts and features to enhance document presentation. These document enhancements include rotating text and graphics, watermarking, working with scanned images, clip art and multi-column layouts necessary for producing newsletters, posters, fliers, and tri-fold mailers. The course may be taken 3 times on a different software package or version.

**CISA 310 Electronic Spreadsheets 1 Unit**

Formerly: CIS 12A

Prerequisite: None

Advisory: CISC 300 and ability to touch type.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course introduces the use of electronic spreadsheet programs. The course will include designing a spreadsheet, developing formulas for automatic calculations, using special functions, developing "what if" models, and producing printed reports. This course may be taken four times on a different software package or version. AA/AS area D2.

**CISA 311 Intermediate Electronic Spreadsheets 1 Unit**

Formerly: CIS 12B

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

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course builds upon previous training in the study of electronic worksheets with emphasis on workbook design and integration, template design, use of complex formulas and built-in financial and database functions. The course also includes look-up tables and the use of worksheet analysis tools. The course may be taken four times for credit on a different software package or version.

**CISA 320 Database Management 1 Unit**

Formerly: CIS 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: CIS 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: CIS 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 for credit on a different software package or version.

**CIS - Applications**

**CISA 160 Project Management Techniques and Software 3 Units**

Prerequisite: None

Advisory: ENGWR 102 or 103; and ENGRD 116; or ESLR 320 and ESLW 320; CISC 300.

Course Not Transferable UC or CSU

Hours: 54 hours LEC

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 300 Beginning Word Processing 1 Unit**

Formerly: CIS 11A

Prerequisite: BUSTEC 300.

Advisory: CISC 300.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This is an introductory course in word processing. It includes basic word processing operations, such as creating, editing, saving, filing, retrieving, and printing text, and introduces selected intermediate functions, such as merge, sort, graphics and macros. The course may be taken four times on a different software package or version. AA/AS area D2.

**CISA 301 Intermediate Word Processing 1 Unit**

Formerly: CIS 11B

Prerequisite: CISA 300 with grade of "C" or better.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course continues the study of word processing with emphasis on applications for business documents and reports, disk management procedures, and printer options. The course may be taken four times on a different software package or version.

**CISA 302 Advanced Word Processing 1 Unit**

Formerly: CIS 11C

Prerequisite: CIS 301 with grade of "C" or better.

### **CISA 330 Desktop Publishing 2 Units**

Formerly: CIS 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. This course may be taken four times on a different software package or version.

### **CISA 331 Intermediate Desktop Publishing 2 Units**

Formerly: CIS 17B

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 335 Introduction to Adobe FrameMaker 2 Units**

Formerly: CIS 19A

Prerequisite: CISC 300.

Advisory: BUSTEC 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 1 Unit**

Formerly: CIS 15A

Prerequisite: None

Advisory: CISC 300 and ability to touch type.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course is an introduction to presentation graphics for business. Topics include system requirements, graphics software, types of graphics, and design techniques for visual presentations. This course may be taken four times on a different software package or version.

### **CISA 405 Scripting for Applications 3 Units**

Formerly: CIS 26

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.

## CIS - Core

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

Formerly: CIS 93

Prerequisite: To be determined with each topic.

Course Not Transferable UC or CSU

Hours: 9-90 hours LEC; 27-135 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**

Formerly: CIS 1L

Prerequisite: None

Corequisite: CISC 300 or CISA 300 or CISA 310 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 will complement CISC 300, CISA 300, CISA 310, and CISA 320. It provides supplemental lab instructions and an additional experience with individualized assistance. The material will reinforce the concepts and techniques presented in these courses. This course may be taken four times for credit. This is a credit/no credit course 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.

**CISC 320 Operating Systems 1 Unit**

Formerly: CIS 14A

Prerequisite: None

Advisory: CISC 300 and ability to touch type.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

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.

**CISC 321 Intermediate Operating Systems 1 Unit**

Formerly: CIS 14B

Prerequisite: CISC 320 (for corresponding operating system).

Advisory: One course in programming is highly recommended.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

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.

**CISC 350 Introduction to Data Communications 1 Unit**

Formerly: CIS 16A

Prerequisite: None

Advisory: CISC 300 and ability to touch type.

Course Transferable to CSU

Hours: 18 hours LEC

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.

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

Formerly: CIS 16B

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

Advisory: CISC 350 with a grade of "C" or better.

Course Transferable to CSU

Hours: 18 hours LEC; 18 hours LAB

This course introduces local area networks and provides hands-on training in 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.

**CISC 361 Microcomputer Support And Repair 3 Units**

Formerly: CIS 29A

Prerequisite: CISC 310, 320 (Windows), and 350 with a grade of "C" or better.

Course Transferable to CSU

Hours: 36 hours LEC; 54 hours LAB

This course is a hardware repair course for stand-alone personal computers. 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.

**CISC 362 Microcomputer and Applications Support 2 Units**

Formerly: CIS 29B

Prerequisite: CISA 300, 310, and 320 with a grade of "C" or better.

Corequisite: CISC 361.

Course Transferable to CSU

Hours: 18 hours LEC; 54 hours LAB

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.

**CISC 363 Advanced Microcomputer Support and Repair 2 Units**

Formerly: CIS 29C

Prerequisite: CISC 361 with a grade of "C" or better.

Course Transferable to CSU

Hours: 27 hours LEC; 27 hours LAB

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.

Hours: 72 hours LEC

**CISC 496 Teaching Assistant in Computer Information Science 1-4 Units**

Formerly: CIS 46

Prerequisite: Successful completion of course in which the student wishes to tutor.

Course Transferable to CSU

Hours: 9-54 hours LEC; 27-162 hours LAB

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.

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

Formerly: CIS 48

Prerequisite: None

Corequisite: Must be enrolled in a minimum of 7 units including work experience.

Course Transferable to CSU

Hours: 18 hours LEC; 75-300 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.

## CIS - Network

### **CISN 100 Network Systems Administration 2 Units**

Formerly: CIS 80

*Prerequisite:* 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

*Course Not Transferable UC or CSU*

*Hours: 45 hours LEC; 27 hours LAB*

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, 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.

*Course Not Transferable UC or 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, 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 103 Network Administration 3 Units**

Formerly: CIS 60

*Prerequisite:* CISC 310 and 320 (DOS or Windows) with a grade of "C" or better.

*Advisory:* One programming language is recommended.

*Course Not Transferable UC or CSU*

*Hours: 45 hours LEC; 27 hours LAB*

This course covers the basics of managing an existing Local Area Network. Topics covered include connecting to a network; utilizing network utilities; planning, accessing, and managing file systems; planning and implementing login and file system security; administering and maintaining the user and printer environment; protecting network data; and installing network applications. Course may be repeated 3 times with different systems.

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

Formerly: CIS 82

*Prerequisite:* CISN 102 with a grade of "C" or better.

*Course Not Transferable UC or CSU*

*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 108 Administering Network Infrastructure 3 Units**

Formerly: CIS 84

*Prerequisite:* CISN 102 with a grade of "C" or better.

*Course Not Transferable UC or CSU*

*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 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.

*Course Not Transferable UC or CSU*

*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, intra 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.

*Course Not Transferable UC or CSU*

*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 115 Advanced Network Administration 2 Units**

Formerly: CIS 61

*Prerequisite:* CISN 103 with a grade of "C" or better.

*Course Not Transferable UC or CSU*

*Hours: 27 hours LEC; 27 hours LAB*

This course covers topics necessary for an experienced network administrator to monitor, maintain and improve the performance of an existing Local Area Network. Course may be taken four times with different versions.

### **CISN 117 Network Installation and Configuration 2 Units**

Formerly: CIS 62

*Prerequisite:* CISN 115.

*Course Not Transferable UC or CSU*

*Hours: 27 hours LEC; 27 hours LAB*

This course covers the basics of installing and configuring a network. Topics covered include installing and configuring network servers, clients, and print servers; setting up system security; setting up workgroups and accounts; and upgrading systems. This course may be taken four times with different systems.

### **CISN 119 TCP/IP Protocols 2 Units**

Formerly: CIS 64

*Prerequisite:* CISN 103, 104.

*Course Not Transferable UC or CSU*

*Hours: 27 hours LEC; 27 hours LAB*

This course covers the TCP/IP protocols used on the Internet and how to install a TCP/IP server on a network. This course may be taken four times on a different version.

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

Formerly: CIS 79A

*Prerequisite:* None

*Advisory:* CISC 320, and CISC 300 or 310.

*Course Not Transferable UC or CSU*

*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.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

Hours: 45 hours LEC; 27 hours LAB

This course covers the installation and administration of messaging servers. Topics include the installation, configuration, management and tuning of mail and messaging services on both servers and clients; mail access protocols; security issues; and Internet connectivity. May be taken 3 times for credit on a different software version.

### **CISN 176 High Performance Web Caching and Firewall Security Via Proxy Server 2 Units**

Formerly: CIS 88

Prerequisite: CISN 108.

Course Not Transferable UC or CSU

Hours: 27 hours LEC; 27 hours LAB

This course covers the planning, installation, configuration and administration of proxy servers. Proxy Servers provide the cornerstone on which to build an Internet Web site, or an intranet, while protecting the rest of the network from the outside world. Topics covered include planning the proxy server implementation; proxy server installation; proxy client configuration; proxy server security; firewall implementation via proxy server; managing and tuning proxy servers; Internet access via proxy servers; high performance Web caching; as well as, troubleshooting and complex deployment/configuration issues.

### **CISN 190 Client Operating Systems 2 Units**

Formerly: CIS 89

Prerequisite: CISN 102.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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 Not Transferable UC or 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.

## CIS - Programming

### **CISP 300 Algorithm Design/Problem Solving 3 Units**

Formerly: CIS 41

Prerequisite: None

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 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. AA/AS 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. (CAN CSCI 10).

### **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. (CAN CSCI 8) 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: 36 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. (CAN CSCI 16) 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 Programming in Visual BASIC 4 Units**

Formerly: CIS 38

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 400 Structured 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 409 Object Oriented Programming 4 Units**

Formerly: CIS 39

Prerequisite: CISP 360 for JAVA, CISP 365 for Delphi, CISP 370 for Advanced Visual BASIC, or a course in the fundamental language of the object oriented programming language with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC; 54 hours LAB

This is an introduction to object oriented programming. The course will look at data and its relationships to the functions that operate data. Topics will include: forms, components, properties, classes, objects, static and dynamic relationships, data bases, data sets, queries, hierarchies, inheritance, coding, dialog boxes, associations, testing and debugging. This course may be taken four times with a different language.

**CISP 430 Data Structures 4 Units**

Formerly: CIS 40

Prerequisite: A course in the fundamental language of the object oriented programming being used with a grade of "C" or better. CISP 365 (Pascal) or CISP 360 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.

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 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**

Formerly: CIS 51

Prerequisite: None

Advisory: CISP 320 or CISP 360.

Course Transferable to CSU

Hours: 54 hours LEC

This course covers the analysis of the computer needs of a client, the design of computer application system solutions, and the documentation needed to convert a new system from the design phase to the operational phase.

**CIS - Web****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.

**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 Art New Media 400) 1 Unit**

Formerly: CIS 21G

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 students who have completed 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 in a different middleware web 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 web scripting language, control structures, functions, arrays, form validation, regular expressions, cookies, environmental variables, email applications, and database-driven web applications. May be taken twice with a different server-side web 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.