## Program Description

Computer Applications program concentrates on microcomputer applications in the area of electronic spreadsheets, electronic presentations, database management, and word processing. The Computer Networking Core-Certificates provides students with entry-level skills in the computer networking field. In the Networking Multi-platform certificate program, students will expand their knowledge through advanced networking and network operating system classes. In the Cybersecurity program, students will take Computer skills needed for an entry level career in Cybersecurity. Students must receive a minimum grade of "C" or better in all required core courses and the specific courses listed as program electives in order to qualify for the degree or certificate.

## Staff

*Please dial (661) 722-6300, then the 4 digit extension.*

| | |
|---|---|
| Division: | |
| Nate Dillon, Dean | x.6275 |
| Casey Farris, Administrative Assistant | x.6482 |
| Bettie Negrete, Clerical Assistant III | x.6482 |
| Kent Moser, Department Chair | x.6175 |
| Faculty: | |
| Jimmie Bowen | x.6173 |
| Steve Corbin | x 6233 |
| Kent Moser | x.6175 |
| Adjunct Faculty: | V.M. |
| Maximo Dueno | 2353 |
| Tim Etherington | 2606 |
| Paul Hurd | 2383 |
| Wayne Lynch | 2611 |
| Jonathan McCary | 2358 |
| Megan Owens | 2183 |
| Garo Panossian | 2525 |
| Robert Price | 2316 |
| Angelo Tepedino | 2333 |

## Career Options

| | |
|---|---|
| Business Applications Programmer | Cybersecurity Analyst |
| Communications Manager | Database Specialist |
| Computer Engineer | Network Administrator |
| Computer Sales | Programming Manager |

(Careers may require education beyond the two-year college level.)

## Program Learning Outcomes

### Computer Applications

1. Demonstrate an understanding of computer components and explain their purpose.
2. Demonstrate the ability to use a word processing software application.
3. Demonstrate the ability to use a spreadsheet software application.
4. Demonstrate the ability to use a database management software application.

### Computer Networking, and Computer Networking Multi-Platform

1. Demonstrate the ability to set up, configure, troubleshoot, and maintain a microcomputer operating system.
2. Demonstrate networking skills that include installing, configuring, and troubleshooting network devices, protocols, and services.
3. Demonstrate networking administration skills related to server operating systems, network security, and directory services administration.

### CyberSecurity

1. Describe the three common Security Operations Center (SOC) types, the different tools used by the SOC analysts, the different job roles within the Security Operations Center, and incident analysis within a threat-centric Security Operations Center.
2. Demonstrate an understanding of the concepts of computer forensics and summarize how to prepare for a computer investigation.
3. Identify various cloud interface standards and protocols for building a cloud infrastructure using the cloud computing reference model.

## Certificate Programs

### Computer Applications

This certificate requires a minimum of 28 units. A maximum of 6 pass/no pass units will be accepted for any of these certificates.

| **Required Courses (28-29 units):** | **units** |
|---|---|
| CA 103, Introduction to Computers and Digital Technology ***or*** CA 221, Computer Concepts and Applications in Business | 3-4 |
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 111, Word Processing–Microsoft Word | 3 |
| CA 121, Microcomputer Spreadsheets | 3 |
| CA 131, Relational Database Management and Design | 3 |
| CA 151, Microcomputer Operating Systems | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 157, Introduction to LINUX | 3 |
| Program Elective | 3 |
| **Total** | **28-29** |

| **Program Electives (Select 3-4 units):** | **units** |
|---|---|
| CA 103, Introduction to Computers and Digital Technology | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 199, Occupational Work Experience | 1-8 |
| CA 221, Computer Concepts and Applications in Business | 4 |

### Computer Networking

The Computer Networking Program consists of two parts: the Computer Networking Core Certificate–an 19-unit, entry-level certificate composed of five basic computer courses and one network operating system elective; and the Computer Networking Multi-Platform Certificate–a 30-unit program that includes the 6 courses in the Core program plus 2 more networking operating system courses and two computer networking electives to provide the student with a breadth of networking experience.

### Computer Networking Core

The Computer Networking Program consists of two parts: the Computer Networking Core Certificate-a 19-unit, entry-level certificate composed of five basic computer courses and one network operating system elective; and the Computer Networking Multi-Platform Certificate-a 31-unit program that includes the six courses in the Core program plus two more networking operating system courses and two computer networking electives to provide the student with a breadth of networking experience. A maximum of 6 pass/no pass units will be accepted for any of these certificates. Computer Networking Core This entry-level "core" certificate is composed of five basic computer courses and one network operating system elective for a total of 19 units.

| Required Courses (19 units): | units |
|---|---|
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 151, Microcomputer Operating Systems | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 176, Windows Server Networking | 3 |
| CA 182, Network Security | 3 |
| **Total** | **19** |

### Computer Networking Multi-Platform

The Computer Networking Program consists of two parts: the Computer Networking Core Certificate - a 19-unit, entry-level certificate composed of five basic computer courses and one network operating system elective; and the Computer Networking Multi-Platform Certificate-a 31-unit program that includes the six courses in the Core program plus two more networking operating system courses and two computer networking electives to provide the student with a breadth of networking experience. A maximum of 6 pass/no pass units will be accepted for any of these certificates. Computer Networking Multi-Platform The Multi-Platform Certificate builds on the Computer Networking Core certificate to enhance the skills and knowledge of the student. Any course taken in the Core certificate does not need to be taken again for the Multi-Platform Certificate.

| Required Courses (31 units): | units |
|---|---|
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 151, Microcomputer Operating Systems | 3 |
| CA 153, Windows Installation and System Support | 3 |
| CA 157, Introduction to LINUX | 3 |
| CA 159, SUSE LINUX Server Administration | 3 |
| CA 171, Intrduction to Networking | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 176, Windows Server Networking | 3 |
| CA 182, Network Security | 3 |
| Program Elective | 3 |
| **Total** | **31** |

| Program Electives (Select 3 units): | units |
|---|---|
| CA 103, Introduction to Computers and Digital Technology | 3 |
| CA 131, Relational Database Management and Design | 3 |
| CA 132, Oracle SQLDatabase Management | 3 |
| CA 183, Security Countermeasures | 3 |

**NOTE:** Substitutions, with prior permission, may be made for certain courses that may not be offered in the two-year period.

### IT Cybersecurity

Students who complete the IT Cybersecurity certificate have enhanced employability in cybersecurity and computer networking. The IT Cybersecurity certificate prepares students to begin a career working with associate-level cybersecurity analysts within security operations centers where responsibilities include detecting cybersecurity breaches and effectively responding to security incidents. This certificate requires 21 units to be completed.

| Required Courses (21 units): | units |
|---|---|
| CA 157, Introduction in Linux | 3 |
| CA 165, Digital Forensics Fundamentals ***or*** CA 166, Cloud Security Fundamentals | 3 |
| CA 170, Virtualization and Cloud Essentials | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 182, Network Security | 3 |
| CA 183, Seurity Counter Measures | 3 |
| **Total** | **21** |

## Associate Degrees

### Computer Applications

The requirements for an associate degree in Computer Applications may be satisfied by completing the Computer Applications certificate, 21 units of general education requirements, and sufficient elective credits to total 61-62 units. (See Graduation/Associate Degree Requirements.) Students who complete the associate degree have enhanced employability in several fields, and are well prepared for entry-level career opportunities in areas such as information technology, help desk support, and general office computer management. The associate degree will also provide students with a broad range of knowledge with which to evaluate and appreciate the physical environment, culture, and society in which they live, with the ability to think and communicate clearly and effectively. Except in cases of a prerequisite requirement, it is not required that courses be taken in exactly this sequence; they are recommended in this order to facilitate success.

| Required Courses (28-30 units): | units |
|---|---|
| CA 103, Introduction to Computers and Digital Technology ***or*** CA 221, Computer Concepts and Applications in Business | 3-4 |
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 111, Word Processing – Microsoft Word | 3 |
| CA 121, Microcomputer Spreadsheets | 3 |
| CA 131, Relational Database Management and Design | 3 |
| CA 151, Microcomputer Operating Systems | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 157, Introduction to LINUX | 3 |
| Program Elective | 3-4 |
| **Total** | **28-30** |

| Program Electives (Select 3-4 units): | units |
|---|---|
| CA 103, Introduction to Computers and Digital Technology | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 199, Occupational Work Experience | 1-9 |
| CA 221, Computer Concepts and Applications in Business | 4 |

Except in cases of a prerequisite requirement, it is not required that courses be taken in exactly this sequence; they are recommended in this order to facilitate success.

**Recommended Pathway**

| **Fall, First Semester** | **units** |
|---|---|
| CA 221, Computer Concepts and Applications in Business | 4 |
| GE requirement Area E (recommended HD 101) | 3 |
| GE requirement Area D1(ENGL 101) | 3 |
| Electives (recommended BIP 110, 120, 130) | 3 |
| | **Total 13** |
| **Spring Second Semester** | |
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 111, Word Processing–Microsoft Word | 3 |
| CA 151, Microcomputer Operating Systems | 3 |
| GE requirement Area A (recommended BIOL 104) | 3 |
| | **Total 13** |
| **Summer** | |
| GE Area B (recommended POLS 101) | 3 |
| Elective (recommended BUS 111) | 3 |
| GE Area C (recommeneded MUSC 102) | 3 |
| | **Total 9** |
| **Fall, Third Semester** | |
| CA 121, Microcomputer Spreadsheets | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 157, Introduction to LINUX | 3 |
| Elective (recommended BUS 113) | 3 |
| | **Total 12** |
| **Spring, Fourth Semester** | |
| CA 131, Relational Database Management and Design | 3 |
| GE requirement Area D2 recommended completion of Intermediate Algebra or higher) | 4 |
| GE requirement Area F (recommended BUS 212) | 3 |
| Program Elective (recommended CA 175) | 3 |
| | **Total 13** |
| | **Degree Total 61-62** |

## Computer Networking Multi-Platform

The requirements for an associate degree in Computer Networking Multi-Platform may be satisfied by completing the Computer Networking Multi-Platform certificate, 21 units of general education requirements, and sufficient elective credits to total 60 units (See Graduation/Associate Degree Requirements). Students who complete the associate degree have enhanced employability in several fields, and are well prepared for entry-level career opportunities in areas such as computer repair, service, maintenance, and installation of computer network hardware and software. The associate degree will also provide students with a broad range of knowledge with which to evaluate and appreciate the physical environment, culture, and society in which they live, with the ability to think and communicate clearly and effectively.

Except in cases of a prerequisite requirement, it is not required that courses be taken in exactly this sequence; they are recommended in this order to facilitate success.

**Recommended Pathway**

| **Fall, First Semester** | **units** |
|---|---|
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 151, Microcomputer Operating Systems | 3 |
| GE requirement area D1 (ENGL 101) | 3 |
| GE requirement area E (recommended HD 101) | 3 |
| Electives (recommended BIP 110, BIP 120, & BIP 130) | 3 |
| | **Total 16** |
| **Spring, Second Semester** | |
| CA 171, Introduction to Networking | 3 |
| CA 175, Administering Windows Server | 3 |
| GE requirement area D2 (recommended Transfer Level Math) | 3-4 |
| Elective (recommended CA 153) | 3 |
| | **Total 12-13** |
| **Summer** | |
| Program Elective (recommended CA 103) | 3 |
| GE requirement Area B (recommended POLS 101) | 3 |
| GE requirement Area C (recommended MUSC 102) | 3 |
| | **Total 9** |
| **Fall, Third Semester** | |
| CA 176, Windows Server Networking | 3 |
| CA 157, Introduction to LINUX | 3 |
| CA 182, Network Security | 3 |
| GE requirement Area A (recommended BIOL 104) | 3 |
| | **Total 12** |
| **Spring, Fourth Semester** | |
| CA 159, SUSE Linux Server Administration | 3 |
| Program Elective (recommended CA 131) | 3 |
| GE requirement Area F (recommended BUS 212) | 3 |
| Elective (recommended CA 183) | 3 |
| | **Total 12** |
| | **Degree Total 61-62** |

*Please refer to the Program Electives listed under the certificate program.*

## IT Cybersecurity

Students who complete the IT Cybersecurity Associates degree will become more knowledgeable and enhanced employability in cybersecurity and computer networking. The IT Cybersecurity Associates degree prepares students for a career working with associate-level cybersecurity analysts within security operations centers, including detecting cybersecurity breaches and effectively responding to security incidents. This degree requires 60-62 units to be completed.

| **Required Courses (21 units):** | **units** |
|---|---|
| CA 157, Introduction in Linux | 3 |
| CA 165, Digital Forensics Fundamentals ***or*** | 3 |
| CA 166, Cloud Security Fundamentals | 3 |
| CA 170, Virtualization and Cloud Essentials | 3 |
| CA 171, Introduction to Networking | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 182, Network Security | 3 |
| CA 183, Security Counter Measures | 3 |

| Program Electives (Select 9 units): | units |
|---|---|
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 131, Relational Database Management and Design | 3 |
| CA 159, SUSE Linux Server Administration | 3 |
| CA 165, Digital Forensics Fundamentals | 3 |
| CA 166, Cloud Security Fundamentals | 3 |
| CA 176,Windows Server Networking | 3 |
| CA 179, Cybersecurity Operations -CCNA-Cyberops | 3 |
| CA 185, Network Security - CCNA Security | 3 |

**Recommended Pathway**

| Fall, First Semester | units |
|---|---|
| Elective: (recommended BIP 110, Keyboarding I) | 1 |
| Elective: (recommended BIP 120, Keyboarding II) | 1 |
| Elective: (recommended BIP 130, Keyboarding III) | 1 |
| CA 107, Microcomputer Hardware and Software Support | 4 |
| CA 157, Introduction to Linux | 3 |
| GE requirement area D1 (ENGL 101) | 3 |
| GE requirement area E (recommended HD 101) | 3 |
| | **Total 16** |
| **Spring, Second Semester** | |
| CA 170, Virtualization and Cloud Essentials | 3 |
| CA 171, Introduction to Networking | 3 |
| GE requirement area D2 (recommended completion of Intermediate Algebra or higher | 3-4 |
| Elective: (recommended CA 153, Windows Install & System Support) | 3 |
| | **Total 13** |
| **Summer** | |
| GE requirement area F (recommended BUS 212) | 3 |
| GE requirement area C (recommended MUSC 101) | 3 |
| GE requirement area B (recommended POLS 101) | 3 |
| | **Total 9** |
| **Fall, Third Semester** | |
| GE requirement area A (recommended BIOL 104) | 3 |
| CA 175, Administering Windows Server | 3 |
| CA 182, Network Security | 3 |
| CA 183, Security Countermeasures | 3 |
| | **Total 12** |
| **Spring, Fourth Semester** | |
| CA 165, Digital Forensics Fundamentals | 3 |
| CA 166, Cloud Security Fundamentals | 3 |
| CA 179, Cybersecurity Operations -CCNA-Cyberops | 3 |
| Program Elective: (recommended CA 185, Network Security - CCNA Security | 3 |
| | **Total 12** |
| | **Degree Total 61** |

## Transfer

Students planning to continue studies at a four-year college or university after AVC should visit the Transfer Resource Center and consult with a counselor as soon as possible. Additional information on official transfer articulation agreements from AVC to many CSU/UC campuses can be found at www.assist.org

## Prerequisite Completion

All prerequisite courses must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of "A," "B," "C" or "P". Classes in which the Pass/No Pass option is available are indicated with an asterisk **(*)** before the course title. See "Pass/No Pass Option" in the catalog for full explanation.

## Computer Applications Courses

### CA 103 *INTRODUCTION TO COMPUTERS AND DIGITAL TECHNOLOGY

*3 units*

*4 hours weekly [2.5 lecture, 1.5 lab]*

This course is designed to introduce students to digital technology and the features of a microcomputer, how a microcomputer operates, and how to select a microcomputer that best fits individual needs. The course includes an examination of information systems and their role in business. Through hands-on operation of a computer, students will develop computer-based solutions to business problems utilizing the major features of popular software applications, including word processors, spreadsheets, database managers, presentation managers, and Internet browsers. (C-ID: BUS 140) (CSU, UC, AVC)

### CA 107 *MICROCOMPUTER HARDWARE AND SOFTWARE SUPPORT

*4 units*

*7 hours weekly [2.5 lecture, 4.5 lab]*

This course is intended to provide students with a workable knowledge that is required for the installation, setup, and troubleshooting of hardware and software related to personal computers and peripheral devices. This course will help students prepare for the A+ Certification Exam. BEFORE ENROLLING, students should be able to create folders, format disks, copy files, rename files, create shortcuts, and use Windows Explorer. This course will involve problem solving and troubleshooting. Students should also be familiar with DOS commands and the installation of application software. (C-ID: ITIS 110) (CSU, AVC)

### CA 111 *WORD PROCESSING–MICROSOFT WORD

*3 units*

*4 hours weekly [2.5 lecture, 1.5 lab]*

***Advisory:*** *Completion of CA 103 or CA 221 and BIP 110.*

This course covers the concepts of word processing emphasizing Microsoft Word. Topics covered include preparing documents, text formatting and editing, management of files and folders, formatting paragraphs, using multiple windows, and standard letter and punctuation styles. This vocationally oriented course will serve students seeking a certificate, associate degree, or desiring to transfer to a four-year institution. BEFORE ENROLLING, students should have used a word processing program to create, save, retrieve, edit, and print. (CSU, AVC)

## CA 121 *MICROCOMPUTER SPREADSHEETS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 103 or CA 221.*
This course is designed to teach computer users how to develop electronic spreadsheets using spreadsheet software such as Microsoft Excel, to solve business related quantitative problems. Topics of instruction include data entry, formulas, functions, charts, macros, and other beginning to intermediate level features of spreadsheet software. **BEFORE ENROLLING,** students should be able to save and retrieve files and perform other basic file management tasks on the computer. (CSU, AVC)

## CA 131 *RELATIONAL DATABASE MANAGEMENT AND DESIGN

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
Database management systems (DBMS) concepts and designs are explored using Microsoft Access. The relational model of database management, which is commonly used on micro and larger computers, is emphasized. The course covers database design, building a model using computer software, application generators, programming in database software, structured query language, and database administration. **BEFORE ENROLLING,** students should possess an understanding of how personal computers, software, and peripherals work together (CSU, AVC)

## CA 132 *ORACLE SQL DATABASE MANAGEMENT

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 103 or CA 131.*
In this course, students will work with the Oracle Relational Database Management System in a client server environment. In both lecture and lab, students will learn Structured Query Language (SQL) by using the Oracle SQL*Plus tool. Proper relational database design that enforces referential integrity will be taught using schema diagrams and entity relationship diagrams. SQL Data Manipulation Language (DML) for reporting and Data Definition Language (DDL) for database creation will be covered. Students will also learn about database security issues such as database users, roles, and grants. BEFORE ENROLLING students should have used database software to create tables, and enter, edit, delete, and sort records. Students should also possess an understanding of how to save and retrieve files from local and network drives. (CSU, AVC)

## CA 151 *MICROCOMPUTER OPERATING SYSTEMS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 103 or CA 221.*
The purpose of this course is to provide an understanding of the role of an operating system in the interaction between computer hardware components and application software. The concept of how a computer works from power-on until power-off will be discussed at length, as well as the boot process. Details will be explored on how an operating system is evaluated based on user needs. This course includes discussions on latest version of Windows, Linux, and Mac OS. There will be extensive hands on exposure to latest version of Windows and Linux. B**EFORE ENROLLING**, students should be advanced latest version of Windows computer users with the ability to manage disks, folders, and files using Windows Explorer. (CSU, AVC)

## CA 153 *WINDOWS INSTALLATION AND SYSTEM SUPPORT

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 103 or CIS 101.*
This course is designed to provide the knowledge and skills needed to support Microsoft Windows in both a stand-alone environment and networking environment. These skills include setup, configuration, migration, optimization, network integration, administration, troubleshooting, and messaging. **BEFORE ENROLLING,** students should be advanced Windows users with ability to create folders, copy files, rename files, create shortcuts and execute applications. (CSU , AVC)

## CA 157 *INTRODUCTION TO LINUX

*(formerly CIS 157)*
*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
*Advisory: Completion of CA 103 or CA 221 or CIS 101.*
This course introduces a variety of the tools and concepts used while working with a UNIX/Linux-based computer system. The course will focus on the shell environment, system administration and security, programming, and the graphical user interface. Students will learn to write shell scripts using basic commands and regular expressions. They will then use those tools to write scripts first with basic shell commands, then with grep, sed, and awk, then with more advanced decision-making and flow control commands. Other scripting tools such as Perl and Python will also be explored. Students will write shell scripts programs to exercise their understanding of tools and concepts. This course will be taught using a combination of lectures, demonstrations, discussions, and hands-on labs. (CSU, AVC)

## CA 159 *SUSE LINUX SERVER ADMINISTRATION

*(formerly CIS 159)*
*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
This course will provide a student with the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. The student will be able to identify environmental issues; understand and comply with disaster recovery and physical/software security procedures; become familiar with industry terminology and concepts; understand server roles/specializations and interaction within the overall computing environment. This in-depth, hands-on course covers a variety of topics: installing and configuring SUSE Linux Enterprise Server, managing users and groups, securing the system, and configuring Web services. By completing multiple lab exercises, students will be able to apply course concepts and strengthen their proficiency in Linux administration. (CSU, AVC)

## CA 165 *DIGITAL FORENSICS FUNDAMENTALS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
This course is an introduction to the methods used to properly conduct a computer forensics investigation beginning with a discussion of ethics, while mapping to the objectives of the International Association of Computer Investigative Specialists (IACIS) certification. Topics covered include an overview of computer forensics as a profession; the computer investigation process; understanding operating systems boot processes and disk structures; data acquisition and analysis; technical writing; and a review of familiar computer forensics tools. (CSU, AVC)

## CA 166 *CLOUD SECURITY FUNDAMENTALS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 182 and CA 170.*
Students will learn how to properly evaluate cloud providers, and perform risk assessment and review. Students will be introduced to the various cloud computing delivery models, ranging from Software as a Service (SaaS) to Infrastructure as a Service (IaaS) and how each delivery models represents an entirely separate set of security conditions to consider, especially when coupled with various cloud types, including public, private, and hybrid. The course will also touch on architecture and infrastructure fundamentals for the private, public, and hybrid clouds, including a wide range of topics such as patch and configuration management, virtualization security, application security, and change management. Policy, risk assessment, and governance within cloud environments will also be covered, with recommendations for both internal policies and contract provisions. This will lead us to a discussion of compliance and legal concerns. (CSU, AVC)

## CA 170 *VIRTUALIZATION AND CLOUD ESSENTIALS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
This course covers cloud deployment and service models, cloud infrastructure, and the key considerations in migrating to cloud computing. This course also provides the required technology essentials across all domains—including server, storage, networking, applications, and databases—-to help develop a strong understanding of virtualization and cloud computing technologies. Prepares students for the Cloud Infrastructure and Services Associate (EMCCIS) Certification and the CompTIA Cloud+. (CSU, AVC)

## CA 171 *INTRODUCTION TO NETWORKING

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP (Internet Protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for further study of computer networks. It uses the OSI (Open Systems Interconnection) and TCP (Transmission Control Protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. The course will cover Local Area Networks (LANs), Wide Area Networks (WANs), physical topologies, logical topologies, network operating systems, network hardware, network troubleshooting, network maintenance, network security. Preparation for the CompTIA Network+ certification exam will be studied. (CSU, AVC)

## CA 175 *ADMINISTERING WINDOWS SERVER

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 103 or CA 221.*
This course will provide a student with the knowledge, and skills required to build, maintain, troubleshoot and support server hardware and software technologies. The student will be able to identify environmental issues; understand and comply with disaster recovery and physical/software security procedures; become familiar with industry terminology and concepts; understand server roles/specializations and interaction within the overall computing environment. (CSU, AVC)

## CA 176 *WINDOWS SERVER NETWORKING

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
This course trains network administrators and support professionals to design, implement, optimize, monitor, and troubleshoot networking services on a Windows server. Students will also learn Transfer Control Protocol/Internet Protocol (TCP/IP) networking design, subnetting, and address resolution. Topics covered will also include Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), Windows Internet Naming Service (WINS), Remote Access Service (RAS), Internet Protocol (IP) routing, and IP security. (CSU, AVC)

## CA 179 *CYBERSECURITY OPERATIONS -CCNA-CYBEROPS

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 171 or CA 182.*
This course introduces students to the knowledge and skills needed to rapidly detect cybersecurity breaches and effectively respond to security incidents. Students will learn to be part of a team of people in a Security Operations Center (SOC) and how to keep a vigilant eye on security systems and protect their organizations by detecting and responding to cybersecurity threats. This course helps prepare students to take the required exams to achieve the CCNA Cyber Ops certification. (CSU, AVC)

## CA 182 *NETWORK SECURITY

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
An introduction to the fundamental principles and topics of Information Technology Security and Risk Management at the organizational level. It addresses hardware, software, processes, communications, applications, and policies and procedures with respect to organizational Cybersecurity and Risk Management. Preparation for the CompTIA Security+ certification exams. (CSU, AVC)

## CA 183 *SECURITY COUNTERMEASURES

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
***Advisory:*** *Completion of CA 182.*
This course introduces the network security specialist to the various methodologies for attacking a network. Students will be introduced to the concepts, principles, and techniques, supplemented by hands-on exercises, for attacking and disabling a network within the context of properly securing a network. The course will emphasize network attack methodologies with the emphasis on student use of network attack techniques and tools and appropriate defenses and countermeasures. Students will receive course content information through a variety of methods: lecture and demonstration of hacking tools will be used in addition to a virtual environment. Students will experience a hands-on practical approach to penetration testing measures and ethical hacking. (CSU, AVC)

## CA 185 *NETWORK SECURITY - CCNA SECURITY

*3 units*
*4 hours weekly [2.5 lecture, 1.5 lab]*
Students will be introduced to security principles and technologies, using various security products to provide hands-on examples. This course allows learners to understand common security concepts and deploy basic security techniques utilizing a variety of popular security appliances within a “real-life” network infrastructure. This course will help students prepare for the CCNA Security exam. (CSU, AVC)

## CA 199 *OCCUPATIONAL WORK EXPERIENCE

*1–8 units*
*hours vary*
***Prerequisite:*** *To participate in work experience, students must have a job or internship which is either paid or voluntary and have the approval of the supervisor and instructor supervising work experience in the specific subject area. PRIOR TO ENROLLING, students must attend a scheduled orientation or meet individually with the supervising instructor for an individual orientation.*
Occupational Work Experience Education is supervised employment designed to provide students a realistic learning experience through work. The ultimate goal is to teach students those skills and attitudes that will equip them to function and adapt as an employee in a variety of situations and jobs. Occupational Work Experience Education is supervised employment extending classroom-based occupational learning at an on-the-job learning station related to the student’s educational major or occupational goal. Credit may be accrued at the rate of one to eight units per semester. For the satisfactory completion of all types of Cooperative Work Experience Education (WE 197 and WE 199), students may earn up to a total of sixteen semester credit hours. (CSU, AVC) **(R3)**

## CA 221 *COMPUTER CONCEPTS AND APPLICATIONS IN BUSINESS

*4 units*
*5 hours weekly [3.5 lecture, 1.5 lab]*
This course includes an examination of information systems and their role in business. The focus will be on information systems, electronic spreadsheets, database management systems, networking, e-commerce, ethics and security, and computer systems hardware and software components. This course includes the application of these concepts and methods in a business enviroment through hands-on projects developing computer-based solutions to business problems. (C-ID: BUS 140 or ITIS 120) (CSU, UC, AVC)