COMPUTER AND INFORMATION SCIENCE (CIS)

CIS-101
Fundamentals of Information Technology **1.5 UNITS**
1.0 hours lecture, 1.5 hours laboratory
Designed for beginners, no previous computer experience is required. This class introduces students to the various careers that IT has to offer. Students will explore PC Hardware, Operating Systems, Networking, Web design, Programming, Security through highly interactive laboratory exercises: Build a personal web page, Build and secure a home or office network, Identify computer components assemble a PC and install an operating system, Program lights, motors, and devices. When completed, students will have the ability to make informed decisions regarding their educational pathway toward a career in Information Technology. (CSU)

CIS-110
Principles of Information Systems **4 UNITS**
3.0 hours lecture, 3.0 hours laboratory
An introductory course in information technology with an emphasis on business and business-related applications. Concepts include computer organization, data processing systems, decision support systems, systems analysis and design. The laboratory component consists of hands-on problem solving using software applications including spreadsheets and databases. (C-ID BUS 140/ITIS 120) (CSU/UC) (CSU-E)

CIS-120
Computer Maintenance and A+ Certification **3 UNITS**
Recommended Preparation: Basic computer skills (basic knowledge of hardware, operating systems, applications software)
2.0 hours lecture, 3.0 hours laboratory
Preparation for the A+ Certification exam, an industry-sponsored test that establishes a benchmark level of knowledge and competence expected of computer service technicians in entry-level positions. A+ Certification also serves as the foundation for computer service professionals who are pursuing other valuable industry certifications such as the Cisco Certified Networking Associate (CCNA), Network+, and Microsoft Certified Professional (MCP). Students will gain a comprehensive knowledge base in computer hardware, DOS and Windows operating systems, networking basics, printers, and customer service. Hands-on labs using the latest computer components and operating systems provide an opportunity for students to enhance their skills in assembling, disassembling, servicing, troubleshooting, and upgrading advanced computer and networking systems. (CSU)

CIS-121
Network Cabling Systems **3 UNITS**
2.0 hours lecture, 3.0 hours laboratory
This course introduces students to the basic concepts of network cabling systems. It focuses on network cabling design, installation, testing, certification and troubleshooting. Students will develop knowledge and skills in installing and testing voice and data cable connectors and jacks, horizontal links and channels, pulling and terminating cables, cable system certification, telecommunications room design, and patch panel installation. The laboratory component allows students to verify concepts introduced in class and develop the knowledge and skills required to build, test, operate and maintain the physical aspects of voice, video and data networks. (CSU)

CIS-125
Network+ Certification **3 UNITS**
Recommended Preparation: Basic computer skills (basic knowledge of hardware, operating systems, applications software)
2.0 hours lecture, 3.0 hours laboratory
Practical course intended for those interested in learning computer networking with an emphasis on earning the Computing Technology Industry Association's certification Network+, a foundation-level, vendor-neutral international industry credential that validates the knowledge of networking professionals. Earning this certification demonstrates that a candidate can describe the features and functions of networking components, and possesses the knowledge and skills needed to install, configure and troubleshoot basic networking hardware, protocols and services. It also indicates technical ability in the areas of media and topologies, protocols and standards, network implementation, and network support. Throughout the course, theory will be demonstrated and practiced in laboratory exercises. Lectures, laboratories and practical assignments will emphasize skills needed to work effectively in the networking environment and to earn the Network+ certification. (C-ID ITIS 150) (CSU)

CIS-140
Databases **3 UNITS**
Recommended Preparation: "C" grade or higher or "Pass" in CIS 110 or equivalent
2.0 hours lecture, 3.0 hours laboratory
Beginning course in database software that provides a solid background in database applications and operation. Students will create, update and retrieve information using a computer and database software. Beneficial for those who wish to use the computer to file, organize, retrieve and create reports from data. (CSU)

CIS-162
Technical Diagramming Using Microsoft Visio **2 UNITS**
Recommended Preparation: Basic computer skills
1.0 hours lecture, 3.0 hours laboratory
Networking and telecommunications professionals must know how to create technical diagrams and drawings, and use computer tools to manage Information Technology (IT) projects. Using Microsoft Visio, students will learn how to create basic and advanced networking and telecommunications diagrams and drawings, building plans, project schedules, and flow charts. Students will also learn how to visualize and create presentations of complex technical and business information systems. Challenging case studies will provide real-world technical and business experiences. (CSU)

CIS-170
Internet of Things (IoT) - Connecting Things **3 UNITS**
2.0 hours lecture, 3.0 hours laboratory
From washing machines to sophisticated components of an airplane's jet engine, even organic items like crops and cows, nearly every object can now be connected to the Internet. The ability to connect things and capture useful data from these connections is transforming organizations in every industry and opening doors for new career specializations. This course is for people who love creating devices. From designing electronic circuits to writing code, the IoT (Internet of Things) provides the platform for various types of professionals. The goal of this course is to explore things and their connection to the IoT by conducting hands-on labs both individually and as a member of a team. Discover the basis of this exciting and emerging field using fun, hands-on activities to model securely connecting sensors to cloud services over IP networks and collecting data in an end-to-end IoT system. While an understanding of basic programming (such as PCAP. Programming Essentials in Python), networking and electronics knowledge is useful, it is not required. (CSU)

CIS-172
Internet of Things (IoT) Security **3 UNITS**
Prerequisite: Successful completion of CIS 170
2.0 hours lecture, 3.0 hours laboratory
The explosive growth of connected IoT devices enables the world's digitization, but also increases the exposure to security threats. You will use the latest technologies to perform vulnerability and risk assessments, then research and recommend risk mitigation strategies for common security threats in IoT systems. The world needs more skilled cybersecurity professionals. Adding IoT Security to your skillset differentiates you from other job candidates. Consider becoming an IoT Specialist in Network Security by combining this course with your CCENT/CCNA Routing & Switching and CCNA Security certifications. Or pair IoT Security with the CCNA Cybersecurity Operations certification and increase your employability with a deeper understanding of the anatomy of an attack and how to mitigate it. (CSU)

CIS-190
Windows Operating System **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 120 or 125 or equivalent or current CompTIA A+ or N+ certification
2.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on application, use and training on a Windows client computer operating system for both beginning and intermediate level students preparing for the current Microsoft Certified Technology Specialist certification exam. Instruction will include: operating system installation and configuration, graphical user interface and command-line commands, hardware installation and configuration, file system management, user and group management, security configuration, network configuration and management, troubleshooting, and disaster recovery. (CSU)

CIS-191
Linux Operating System **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 120 or 125 or equivalent or current CompTIA A+ or N+ certification
2.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on application, use and training on a Linux client computer operating system for both beginning and intermediate-level students. Instruction will include: operating system installation and configuration, graphical user interface and command-line commands, hardware installation and configuration, file system management, user and group management, security configuration, network configuration and management, troubleshooting and disaster recovery. Course maps to the Computer Technology Industry Association (CompTIA) Linux+ and Linux Professional Institute (LPI) Certification Level 1 certification exams. (CSU)

CIS-201
Cisco Academy - Introduction to Networking **3 UNITS**
Recommended Preparation: "C" grade or higher or "Pass" in CIS 125 or equivalent
2.0 hours lecture, 3.0 hours laboratory
This is the first of four courses designed to provide knowledge, experience and skills in current and emerging networking technology. This course is also designed to help students prepare for the professional certification as a CISCO Certified Network Associate (CCNA). This course introduces you to fundamental networking concepts and technologies. In this course, you will learn both the practical and conceptual skills that build the foundation for understanding basic networking. Students will: examine human versus network communication and see the parallels between them; be introduced to the two major models used to plan and implement networks: OSI and TCP/IP; learn about network devices and network addressing schemes, and discover the types of media used to carry data across the network. This course maps to the current CISCO Certified Networking Associate curriculum version. (CSU)

CIS-202
Cisco Academy - Routing, Switching, and Wireless Essentials **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 201 or completion of CCNA1 Version 6 at another Cisco Networking Academy, or explicit instructor permission
2.0 hours lecture, 3.0 hours laboratory
This is the second of four courses designed to provide knowledge, experience and skills in current and emerging networking technology. This course is also designed to help students prepare for the professional certification as a CISCO Certified Network Associate (CCNA). Routing and Switching Essentials describes the architecture, components, and operations of routers and switches. Students learn how to configure basic router and switch functions necessary for planning and implementing small networks. By the end of this course, students will be able to configure routers and switches and troubleshoot common issues with the Routing Information Protocol (RIPv1, RIPv2, and RIPng), single-area Open Shortest Path First Protocol (OSPF), Dynamic Host Configuration Protocol (DHCP), Network Address Translation (NAT), Access Control lists (ACLs), Virtual Local Area Networks (VLANs), and inter-VLAN routing in both IPv4 and IPv6 networks. This course maps to the current CISCO Certified Networking Associate curriculum version. (C-ID ITIS 151) (CSU)

CIS-203
Cisco Academy - Enterprise Networking, Security, and Automation **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 202 or completion of CCNA2 Version 6 at another Cisco Networking Academy, or explicit instructor permission
2.0 hours lecture, 3.0 hours laboratory
This is the third of four courses designed to provide knowledge, experience and skills in current and emerging networking technology. This course is also designed to help students prepare for the professional certification as a CISCO Certified Network Associate (CCNA). Scaling Networks describes the architecture, components, and operations of routers and switches in larger and more complex networks. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with Open Shortest Path First (OSPF) protocol, Enhanced Interior Gateway Routing Protocol (EIGRP), First Hop Redundancy Protocols (HSRP), EtherChannel, and Spanning-Tree Protocol (STP) in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement a WLAN in a small-to-medium network. This course maps to the current CISCO Certified Networking Associate curriculum version. (CSU)

CIS-209
Cisco CyberOps **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 202 or equivalent or successful completion of the current version of CCNA1, and 2 at another Cisco Networking Academy or possess a current CCNA or CCENT certification
2.0 hours lecture, 3.0 hours laboratory
Designed for students seeking career-oriented, entry-level security specialist skills. Provides the technical knowledge and skill experience needed to prepare for entry-level security specialist careers. The CCNA Security curriculum blends classroom hands-on experience using Cisco routers, switches, ASAs and an online e-learning solution to develop an in-depth understanding of network security principles and security tools such as: protocol sniffers/analyzers, TCP/IP and common desktop utilities; Cisco IOS-based network security, administrative access security and Intrusion Prevention System (IPS); Cisco ASA Firewalls; AAA; and VPNs. Preparation for the Implementing Cisco Network Security (IINS) certification exam (210-260 IINS), leading to the CCNA CyberOps certification. (CSU)

CIS-210
Cisco Networking Academy - Voice **4 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 203 or equivalent or Cisco Networking Academy CCNA1, 2, 3; or possess current CCNA certification
3.0 hours lecture, 3.0 hours laboratory
The CISCO Networking Academy-Voice course covers the topics aligned to the Introducing CISCO Voice and Unified Communications Administration (ICOMM v8.0) 640-461 professional certification exam. This course introduces students to the architecture, components, functionalities, and features related to CISCO Unified Communications. This is a lab-intensive course providing students with the hands-on experience necessary to perform tasks related to system monitoring, moves, additions and changes on CISCO Unified Communications Manager, CISCO Unified Communications Manager Express, CISCO Unity Connection, and CISCO Unified Presence. (CSU)

CIS-211
Web Development I **3 UNITS**
Recommended Preparation: Basic computer skills (ability to use the Internet, word process documents, manage electronic files)
2.0 hours lecture, 3.0 hours laboratory
This course is a hands-on overview of current web development. Emphasis will be placed on coding and debugging valid HTML and Cascading Style Sheets (CSS), but the course will also include design principles and introductory graphics to encourage attractive, usable design. Mobile development will be introduced. Student will use industry standard development environments to create websites. (CSU)

CIS-213
Web Development II **3 UNITS**
Recommended Preparation: "C" grade or higher or "Pass" in CIS 211 or equivalent
2.0 hours lecture, 3.0 hours laboratory
This course builds on the skills introduced in Web Development I (CIS 211) with hands-on projects that reinforce and further develop HTML5 and CSS3 expertise. Mobile development is addressed in detail. Also covered are content management systems, Search Engine Optimization (SEO), usability, and use of hosted and local servers. (CSU)

CIS-215
JavaScript Web Programming **3 UNITS**
Recommended Preparation: "C" grade or higher or "Pass" in CIS 211 or equivalent or one year verifiable HTML and CSS coding experience
2.0 hours lecture, 3.0 hours laboratory
JavaScript, the most popular web development language, works with HTML and CSS to add interactivity, special effects, and functionality to web pages. This introduction to JavaScript focuses on using JavaScript to develop practical front-end web components such as menus, slide shows, accordions, tabs, form validators, and date pickers. The foundation is set with JavaScript coding and syntax basics and quickly moves on to manipulating web page elements. Students then learn to work with JQuery and jQuery UI, free JavaScript libraries commonly used by web developers to simplify JavaScript programming. The course includes practical examples and hands-on assignments. (CSU)

CIS-219
PHP/MySQL Dynamic Web-based Applications **3 UNITS**
Recommended Preparation: Prior experience with HTML/CSS coding, programming, and database development. These skills can be acquired by completing CIS 211, CIS 140, and any Computer Science course.
2.0 hours lecture, 3.0 hours laboratory
PHP, a popular server-side web development language, is used to develop web applications that collect data from HTML forms and store them in databases like MySQL. Examples include online stores and content driven sites like WordPress and Wikipedia. This introduction to PHP and MySQL provides the knowledge and skills necessary to develop dynamic web-based applications that allow users to create, read, update, and delete database data via web browser forms. Students will build practical web applications such as shopping carts, address books, and more. (CSU)

CIS-220
E-Commerce and Web Presence **3 UNITS**
Recommended Preparation: Basic familiarity with the PC or Mac and Web browsing is strongly recommended. Basic Web site creation skills are also recommended.
3.0 hours lecture
This course covers the principles and technologies involved in creating a Web presence for a small or medium sized business (SMB). Students will create a starter e-business website. (CSU)

CIS-225
Web Development Capstone **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 211 or equivalent and completion of 15+ units with a "C" grade or higher or "Pass" from the following: CIS 140, 211, 213, 215, 219; GD 105, 126, 217
2.0 hours lecture, 3.0 hours laboratory
In this course, participants build professional quality websites, gaining the experience and work examples necessary to find employment in the field. The practical, hands-on work of the class will require participants to reinforce and synthesize learning from the Web Development degree core and explore topics too new or advanced for prior courses. Participants will be guided through project analysis, design, development, implementation and evaluation. (CSU)

CIS-261
NSSA Degree Capstone **2 UNITS**
Prerequisite: Completion of 30+ units with a "C" grade or higher or "Pass" from the following courses: CIS 120, 121, 125, 140, 190, 191, 201, 202, 203, 209, 210, 263, 290, 291, 293, 294, 295, CS 119, 119L or equivalent
1.0 hours lecture, 3.0 hours laboratory
This Networking, Security and System Administration (NSSA) course allows students to verify skills and knowledge obtained in previous computer, networking, security, and telecommunications classes. Students will design, build, test, operate and maintain end-to-end converging and unified information and communication networks during the capstone's "hands-on" lab. (CSU)

CIS-263
Fundamentals of Network Security **3 UNITS**
Recommended Preparation: "C" grade or higher or "Pass" in CIS 125 or 201 or equivalent, and "C" grade or higher or "Pass" in 190 or 191 or equivalent
2.0 hours lecture, 3.0 hours laboratory
Entry-level course in network security that addresses the various aspects of designing and implementing a secure network. Designed for students interested in understanding the field of network security and how it relates to other areas of Information Technology (IT). Covers materials included in the CompTIA (Computing Technology Industry Association) Security+ exam. (C-ID ITIS 160) (CSU)

CIS-264
Ethical Cybersecurity Hacking **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 263 or CIS 209
2.0 hours lecture, 3.0 hours laboratory
This course immerses IT Professionals in hands-on intensive environments, providing in-depth knowledge and experience with current essential security systems. Provides understanding of perimeter defenses and leads to scanning and attacking networks; no real networks are harmed. Students learn how intruders escalate privileges and the steps to be taken to secure a system. Also covers Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows, and Virtual Creation. Focus includes legal and regulatory requirements, ethical issues, basic methodology and technical tools used for ethical hacking and penetration tests. Students establish a pre-test agreement with the enterprise, discover and exploit vulnerabilities, participate as a member of a pen test team and prepare a penetration test report. (CSU)

CIS-265
Computer Forensics Fundamentals **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 264 or equivalent
2.0 hours lecture, 3.0 hours laboratory
This course introduces the methods used to properly conduct a computer forensics investigation. Topics include ethics, computer forensics as a profession, the computer investigation process, operating systems boot processes and disk structures, data acquisition and analysis, technical writing, and a review of familiar computer forensics tools. The course prepares students for Computer Hacking Forensic Investigation certification (CHFI ECO 312-46). (CSU)

CIS-267
Directed Work Experience in CIS **1-4 UNITS**
Prerequisite: 12 units in CIS/CS courses related to field in which work experience is sought and current resume highlighting computer science or information system experience and course-related study
Work experience at a designated industry site in an information and communication technology (ICT) occupation category for students seeking job experience in the ICT industry. Occupational cooperative work experience credit may accrue at the rate of one to eight units per semester for a total of sixteen units, and students must work 75 paid hours or 60 non-paid hours per unit earned. May be taken for a maximum of 12 units. 75 hours paid or 60 hours non-paid work experience per unit, 1-4 units. (CSU)

CIS-270
Palo Alto Network Security I **3 UNITS**
Recommended Preparation: CCNA 1-4, CCNA Security, Security +
2.0 hours lecture, 3.0 hours laboratory
The Palo Alto Academy course feature hands-on lab training using Palo Alto Networks® next-generation firewalls. This course maps to certification exams that validate proficiency in managing Palo Alto Networks next-generation firewalls. Students learn the fundamentals of cybersecurity and identify the concepts required to recognize as well as mitigate attacks against enterprise networks and mission-critical infrastructure; general concepts involved in maintaining a secure network computing environment; students evaluate cybersecurity principles and demonstrate how to secure a network computing environment through the application of security controls. Students will learn the nature and scope of today's cybersecurity challenges, strategies for network defense and detailed information about next-generation cybersecurity, students will also deploy a variety of security methodologies as well as technologies and concepts used for implementing secure network environments. Students will gain a general understanding of how to install, configure and manage firewalls for the defense of enterprise network architecture. Students will also learn the theory and steps for setting up the security, networking, threat prevention, logging and reporting features of next-generation firewalls. This course is aligned with the U.S. National Initiative for Cybersecurity Education (NICE) framework. (CSU)

CIS-271
Palo Alto Networks - Certified Network Security Administrator (PCNSA) **3 UNITS**
Recommended Preparation: CIS 270
2.0 hours lecture, 3.0 hours laboratory
Cybersecurity has become an essential survival skill for the modern world. The ability to secure information networks is increasing in demand every day. The Palo Alto Networks firewalls have become the industry standard for front-line Cybersecurity appliances. This course is designed to teach students to configure and manage next-generation firewalls. This is the second course in a series of three that trains students to become Network Security professionals. Students will learn to build and deploy Global Protect systems, manage and maintain high availability firewall protection, and monitor network traffic. Upon completion, students will be prepared to take the PCNSA exam for certification. (CSU)

CIS-272
Palo Alto Networks Firewall Configuration, Management, and Threat Prevention **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 270 and CIS 271 or equivalent
2.0 hours lecture, 3.0 hours laboratory
Palo Alto Networks firewalls are leaders in Cybersecurity. This is the third course designed to teach students how to plan for security, design and implement Palo Alto firewalls for optimum protection. Students will learn to build and deploy high availability firewalls for the defense of Enterprise network architecture. Students will also learn features necessary for setting up traffic handling, advanced content and user identification, quality of service, GlobalProtect, monitoring and reporting, and high availability of next-generation firewalls. This course prepares students to take the Palo Alto Certified Network Security Engineer (PCNSE) exam. (CSU)

CIS-290
Windows Server-Installing and Configuring **2 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 190 or equivalent or current Microsoft Certified Technology Specialist (MCTS) 70-680 certification
1.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on system administration course focusing on the installation, initial implementation, and configuration of Windows server software core services, including: Active Directory (AD) Domain Services, local storage, file and print services, group policy and server virtualization technologies. (CSU)

CIS-291
Linux System Administration **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 191 or equivalent
2.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on application and instruction in multi-user, multi-tasking operating systems and networked operating systems. Topics include: operating system installation and configuration, storage configuration and management, server security configuration, user and group management, configuration and management of various server roles (such as LDAP, DNS, DHCP, Print, Mail, Samba, Apache), troubleshooting, and disaster recovery. Course maps to the Linux Professional Institute (LPI) Certification Level 4.5 exam and the Red Hat Systems Administrator certification. (CSU)

CIS-293
Windows Server-Administering **2 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 190 or equivalent or current Microsoft Certified Technology Specialist (MCTS) 70-680 certification
1.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on system administration course focusing on the administration tasks essential to administering a Windows server infrastructure, including: user and group management, network access, and data security. (CSU)

CIS-294
Windows Server-Advanced Configuration **2 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 190 or equivalent or current Microsoft Certified Technology Specialist (MCTS) 70-680 certification
1.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on system administration course focusing on advanced Windows server configuration tasks, including: fault tolerance, certificate services and identity federation. (CSU)

CIS-295
VMware Certified Professional **3 UNITS**
Prerequisite: "C" grade or higher or "Pass" in CIS 290 or 291 or equivalent or two years verifiable server administration experience
2.0 hours lecture, 3.0 hours laboratory
Comprehensive hands-on instruction on enterprise level data center virtualization. Topics include: concepts of Data Center Virtualization; common IT virtualization challenges faced by organizations; and installation, configuration, and management of VMware vSphere (which consists of VMware ESXi and VMware vCenter Server). Course maps to the current VMware Certified Professional exam. (CSU)