COMPUTER AND INFORMATION SCIENCE (CIS)

See Business Office Technology for specific Microsoft applications such as Word, PowerPoint, Excel, and Access.

105 INTRODUCTION TO COMPUTING 2 UNITS
2 hours lecture
Introductory computing course for those desiring beginning computer knowledge and skills. Includes an overview of a typical personal computer system including input and output devices, the processor, and storage devices. Emphasis is on those skills and knowledge needed to use a home or small business computer.
CSU

110 PRINCIPLES OF INFORMATION SYSTEMS 4 UNITS
C-ID BUS 140/ITIS 120
3 hours lecture, 3 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.
CSU, CSU GE, UC

120 COMPUTER MAINTENANCE AND A+ CERTIFICATION 3 UNITS
Recommended Preparation: Basic computer skills (basic knowledge of hardware, operating systems, applications software)
2 hours lecture, 3 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, network 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

125 NETWORK+ CERTIFICATION 3 UNITS
C-ID ITIS 160
Recommended Preparation: Basic computer skills (basic knowledge of hardware, operating systems, applications software)
Prerequisite: "C" grade or higher in CIS 110 or equivalent
2 hours lecture, 3 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 possesses knowledge and skills relating to basic computer 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. Laboratory and practical assignments will emphasize skills needed to work effectively in the networking environment and to earn the Network+ certification.
CSU

140 DATABASES 3 UNITS
Recommended Preparation: "C" grade or higher or "Pass" in CIS 110 or equivalent
2 hours lecture, 3 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

162 TECHNICAL DIAGRAMMING USING MICROSOFT VISIO 2 UNITS
Recommended Preparation: Basic computer skills
1 hour lecture, 3 hours laboratory
Networking and telecommunications professionals must know how to create technical 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 parts lists. 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

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 hours lecture, 3 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

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 hours lecture, 3 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 Computing Technology Industry Association (CompTIA) Linux+ and Linux Professional Institute (LPIC) Certification Level 1 certification exams.
CSU

201 CISCO NETWORKING ACADEMY I 3 UNITS
Recommended Preparation: "C" grade or higher or "Pass" in CIS 125 or equivalent
2 hours lecture, 3 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 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.

202 CISCO NETWORKING ACADEMY II 3 UNITS
Prerequisite: "C" grade or higher or "Pass" in CIS 201 or completion of CCNA Version 6 at another Cisco Networking Academy, or explicit instructor permission
2 hours lecture, 3 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.
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203 CISCO NETWORKING ACADEMY III 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 hours lecture, 3 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 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.

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204 CISCO NETWORKING ACADEMY IV 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 203 or completion of CCNA3 Version 6 at another Cisco Networking Academy, or explicit instructor permission
2 hours lecture, 3 hours laboratory
This is the fourth 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) using the current Cisco Academy curriculum. Connected Networks discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot complex devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement virtual private network (VPN) operations in a complex network.

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205 IMPLEMENTING CISCO IP ROUTING (ROUTE) 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 204 or equivalent or successful completion of the current version of CCNA1, 2, 3 and 4 at another Cisco Networking Academy or possess a current CCNA.
2 hours lecture, 3 hours laboratory
This course covers topics necessary to successfully complete the Cisco Certified Networking Professional ROUTE certification. Skills necessary for implementing, monitoring, and maintaining routing services in an enterprise network will be enhanced. Students will learn how to plan, configure, and verify the implementation and troubleshooting of advanced Cisco IOS-based route protocols, including: IGMP, VRRP (Virtual Redundant Router Protocol), GLBP (Gateway Load Balancing Protocol), VTP (Virtual Trunking Protocol), STP (Spanning Tree Protocol), OSPFv3, IPv6 routing, and IPv6 translation. The lab-intensive course provides hands-on experience by performing case studies using Cisco networking devices.

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206 CISCO NETWORKING ACADEMY VI 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 205 or equivalent
2 hours lecture, 3 hours laboratory
This course, combined with CIS 205 Cisco Networking Academy V, covers topics necessary to successfully complete the Cisco Certified Networking Professional ROUTE certification. Skills necessary for implementing, monitoring, and maintaining routing services in an enterprise network will be enhanced. Students will learn how to plan, configure, and verify the implementation of complex enterprise LAN and WAN routing solutions using a range of routing protocols in IPv4 and IPv6 environments. Continues using the CCNP ROUTE certification content learned in CIS 205 and introduces new topics: BGP (Border Gateway Protocol); secure routing solutions to support branch offices and mobile workers; introduction to IPv6; IPv6 addressing and routing; OSPFv3; IPv6 tunneling; and IPv4 to IPv6 translation. This lab-intensive course provides hands-on experience by performing case studies using Cisco networking devices.

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207 CISCO NETWORKING ACADEMY VII 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 204 or equivalent or successful completion of the current version of CCNA1, 2, 3 and 4 at another Cisco Networking Academy or possess a current CCNA certification.
2 hours lecture, 3 hours laboratory
Cisco Networking Academy VII–Switch is the fifth level of Cisco Networking Academy routing and switching courses and one of three courses for the Cisco Certified Networking Professional designation. Students will learn how to implement, monitor, secure, and maintain network switching solutions in converged enterprise campus networks. Campus Network Technologies include: Multilayer Switching, VLANs, VTP (VLAN Trunking Protocol), STP (Spanning Tree Protocol), Switch security techniques (Private VLANs, AAA, AVCS), IEEE 802.1x, and various IOS-based security methodologies (VLAN (Switched Port Analyzer), Port Security, IACP (EtherChannel), Link Aggregation Control Protocol), Inter-VLAN Routing, HSRP (Hot Standby Router Protocol), VRP (Virtual Redundant Router Protocol), GLBP (Gateway Load Balancing Protocol), SNMP (Simple Network Management Protocol) and NTP (Network Time Protocol). This lab-intensive course provides hands-on learning and practice to reinforce configuration skills using Cisco networking devices.

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208 CISCO NETWORKING ACADEMY VIII 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 205 and 207 or equivalent or successful completion of the current Cisco Networking Academy CCNP ROUTE and SWITCH courses at another Cisco Networking Academy or possess current CCNP ROUTE and SWITCH certifications.
2 hours lecture, 3 hours laboratory
Cisco Networking Academy VIII–TSBOOT is the seventh level of Cisco Networking Academy courses and one of three courses for the Cisco Certified Networking Professional designation. Students will learn how to plan, configure, and maintain complex enterprise routed and switched IP networks. Skills learned are based on systematic and industry recognized approaches to plan and execute regular network maintenance including support and troubleshooting network problems using technology-based processes and best practices. Troubleshooting topics include: processes for complex enterprise networks; tools and methodologies; converged routed solutions; routing solutions; addressing services; network performance issues; converged networks; network security implementations; and complex enterprise security. This lab-intensive course provides hands-on learning and practice to reinforce troubleshooting skills using Cisco networking devices.

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209 CISCO NETWORKING ACADEMY IX 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 202 or equivalent or successful completion of the current version of CCNA1, 2, and 2 at another Cisco Networking Academy or possess a current CCNA or CCENT certification.
2 hours lecture, 3 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 online e-learning solution to develop an in-depth understanding of network security principles and security tools such as: protocol sniffers/analysers, TCP/IP and common desktop utilities; Cisco IOS-based network security, administration, 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 help the CCNA Security certification.

CSU

210 CISCO NETWORKING ACADEMY–VOICE 4 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 204 or equivalent or Cisco Networking Academy CCNA1, 2, 3, and 4 version 4 or version 5; or possess current CCNP certification.
3 hours lecture, 3 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

211 WEB DEVELOPMENT I 3 UNITS
Recommended Preparation: Basic computer skills (ability to use the Internet, word processing documents, manage electronic files)
2 hours lecture, 3 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.

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213 WEB DEVELOPMENT II 3 UNITS
Recommended Preparation: “C” grade or higher or “Pass” in CIS 211 or equivalent
2 hours lecture, 3 hours laboratory
This course builds upon 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.

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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 hours lecture, 3 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.

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218 INTRODUCTION TO WEB PROGRAMMING 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 211 or equivalent or one year verifiable HTML and CSS coding experience
2 hours lecture, 3 hours laboratory
This course introduces web programming principles using PHP, one of the most popular server-side web programming languages. Students will learn introductory programming skills and database development using MySQL.

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219 PHP/MYSQL DYNAMIC WEB-BASED APPLICATIONS 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 211 or equivalent or one year verifiable HTML and CSS coding experience and “C” grade or higher or “Pass” in any CS course or one year verifiable programming experience
2 hours lecture, 3 hours laboratory
PHP, one of the most popular server-side web development languages, is used for powerful web applications that collect data from HTML forms and stores 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.

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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, 216, 219, GD 105, 126, 217 2 hours lecture, 3 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.

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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, 204, 209, 210, 262, 263, 290, 291, 293, 294, 295, CS 119, 119L, or equivalent
1 hour lecture, 3 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 and use hands-on experience configuring a variety of network devices and systems.

CSU

262 WIRELESS NETWORKING 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 120, CIS 121, or CIS 125 or successful completion of CIS 201 or equivalent or possess current CCNA or CCNET certification or two years verifiable networking work experience.
Recommended Preparation: “C” grade or higher or “Pass” in CIS 190, 202 or equivalent
2 hours lecture, 3 hours laboratory
Covers WLAN (Wireless Local Area Network) topics including basic wireless principles, wireless technology concepts, wireless networking devices, 802.11 antenna technology, and WLAN Security. Introduces 802.11 WLAN communication standards available today.

CSU

263 FUNDAMENTALS OF NETWORK SECURITY 3 UNITS
Prerequisite: CIS 125 or equivalent or current Microsoft Certified Technology Specialist (MCTS) 70-647 certification
2 hours lecture, 3 hours laboratory
Covers materials included in the CompTIA (Computing Technology Industry Association) Security+ exam.

CSU

264 ETHICAL CYBERSECURITY Hacking 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 263 or CIS 209
2 hours lecture, 3 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.

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265 COMPUTER FORENSICS FUNDAMENTALS 3 UNITS
Prerequisite: Completion of CIS 264 with grades of “C” or better
2 hours lecture, 3 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 Forensics Investigation certification (CHFI ECO 312-46).

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267 DIRECTED WORK EXPERIENCE IN CIS 1-4 UNITS
Prerequisite: 12 units in CIS/CSC courses related to field in which work experience is sought and current resume highlighting computer science or information system experience and course-related study
5 hours paid or 4 hours unpaid work experience per week per unit
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. May be taken for a maximum of 12 units.

CSU

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) 70-647 certification
1 hour lecture, 3 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

291 LINUX SYSTEM ADMINISTRATION 3 UNITS
Prerequisite: “C” grade or higher or “Pass” in CIS 191 or equivalent
2 hours lecture, 3 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 2 exam.

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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 hour lecture, 3 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

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 hour lecture, 3 hours laboratory
Comprehensive hands-on system administration course focusing on advanced Windows server configuration tasks, including: fault tolerance, certificate services, and identity federation.
CSU

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 hours lecture, 3 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.
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