Information Technology - Networking, A.A.S.

Information technology connects people, departments and companies for communication purposes. The technology of local area networks gives employees the ability to share and retrieve information at the group level. Combining local area networks with the Internet and telecommunications resources gives employees unlimited intranet access to information throughout the company and beyond. The associate of applied science degree in information technology provides students with a foundation in designing, installing and implementing computer networking resources. Course requirements include network operations and product-specific requirements for Windows, Linux and Cisco.

(Major Code 2330; State CIP Code 11.0901)

- Information Technology (http://www.jccc.edu/information-technology)

Associate of Applied Science Degree

First Semester

IT 140	Networking Fundamentals	4
IT 205	Implementing Windows Client	3
IT 230	Linux Fundamentals	3
ENGL 121	Composition I*	3
Social Science and/or Economics Elective ^		3
Total Hours		16

^ Social Science and/or Economics Elective (http://catalog.jccc.edu/spring/degreecertificates/electives/social-sci-econ-aas)

Second Semester

IT 221	Windows Server*	3
IT 209	Scaling Networks *	4
IT 145	Routing and Switching Essentials *	3
MATH 171	College Algebra*	3
ENGL 122	Composition II*	3
or ENGL 123	Technical Writing I*	
Total Hours		16

Third Semester

Technical Elective (see below)		3
IT 225	Windows Active Directory Services*	3
IT 231	Linux Administration*	3
IT 247	Accessing Wide Area Networks*	3
Humanities Elective ^		3
Health and/or Physical Education Elective ^^		1
Total Hours		16

^ Humanities Elective (http://catalog.jccc.edu/spring/degreecertificates/electives/humanities-aas)

^^ Health and/or Physical Education Elective (http://catalog.jccc.edu/spring/degreecertificates/electives/health-and-or-physical-ed-aas)

Fourth Semester

Technical Electives (see below)		6
IT 245	Network Infrastructure*	3
IT 251	Network Security Fundamentals*	4
SPD 121	Public Speaking	3
or SPD 125	Personal Communication	
Total Hours		16

Technical Elective

CS 134	Programming Fundamentals	4
CPCA 121	Introduction to Project Management*	1
ELEC 126	Microcomputer A+ Preparation	4
ELEC 185	LAN Cabling and Installation	3
ELEC 250	Microcomputer Maintenance*	3
IT 203	Voice Over IP Fundamentals*	4
IT 228	Exchange Server*	3
IT 232	Linux Networking*	4
IT 233	Linux Advanced Administration	4
IT 249	Advanced Routing*	3
IT 250	Networking Seminar*	3
IT 253	Advanced Switching*	3
IT 256	Windows Security*	4
IT 271	Information Technology Internship I*	3
IT 272	Information Technology Internship II*	3
IT 292	Special Topics:*	1-3

Total Program Hours: 64

Courses

IT 140 Networking Fundamentals* (4 Hours)
Prerequisites or corequisites: RDG 126 or College Reading Readiness

This course serves as the first module of four that are designed to prepare students to complete the Cisco Certified Network Associate (CCNA) Certification. The course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the CCNA curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. 3 hrs. lecture 2 hrs. open lab/wk.

IT 145 Routing Protocols and Concepts* (3 Hours)
Prerequisites: IT 140

This course is designed to provide students with a fundamental understanding of network routing and the operation of routers. Students successfully completing this course will be able to configure common routing protocols such as RIP (Routing Information Protocol), EIGRP (Enhanced Interior Gateway Routing Protocol), and OSPF (Open Shortest Path First), and design and implement addressing schemes using subnetting and CIDR (Classless Inter Domain Routing). Laboratory exercises will accompany lectures. 3 hrs. lecture, 2 hrs. open lab/wk.

IT 203 Voice Over IP Fundamentals* (4 Hours)
Prerequisites: IT 145

This course is designed to provide students with the fundamentals of Voice over IP (VoIP) networking technology. Concepts covered include an explanation of the national voice and data network, telephony terminology, VoIP protocol analysis and telephony survey techniques. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 205 Implementing Windows Client* (3 Hours)
Prerequisites or corequisites: RDG 126 or College Reading Readiness

The focus of this course is the use of Microsoft Windows as an operating system in a business environment. Planning a simple network system, installation and configuration of the software and hardware, resource management, connectivity, running application software under Windows, monitoring and optimizing system hardware, and troubleshooting all lead the student to a deeper understanding of local area network use and administration. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 209 LAN Switching* (4 Hours)
Prerequisites: IT 140

This course is designed to provide students with the necessary knowledge and skills to interconnect and configure network switches. Students successfully completing this course should be able to perform basic switch administration tasks including installing, configuring and troubleshooting. Students will build Local Area Networks (LANs) based on the hierarchical design model supported by Virtual LANs (VLANs) and the Spanning Tree Protocol (STP). 3 hrs. lecture and 2 hrs. open lab/wk.

IT 221 Windows Server* (3 Hours)
Prerequisites: IT 205

This course is designed to provide students with the knowledge and skills to perform competently in the role of a network administrator utilizing the Windows network operating system. Students completing this course will be able to accomplish basic fundamental network management tasks, including planning server roles and subsequent requirements, planning the network file system, implementing user accounts and file system security, implementing network printing, and managing the network servers. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 225 Windows Active Directory Services* (3 Hours)
Prerequisites: IT 221

The focus of this course is using Microsoft Windows Server or Advanced Server software to install, configure and troubleshoot Active Directory components, Domain Name Space (DNS) for Active Directory and Active Directory security solutions. The course also emphasizes the skills required to manage, monitor and optimize the desktop environment using Group Policy. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 228 Exchange Server* (3 Hours)
Prerequisites: IT 225

This course is designed to provide network administrators with information that enhances their ability to manage an Exchange server network. Included are topics related to server and client mail management and server performance, e-mail concepts and advanced Internet networking. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 230 Linux Fundamentals* (3 Hours)
Prerequisites or corequisites: RDG 126 or College Reading Readiness

This course is designed to provide students with a fundamental understanding of the Linux operating system environment. Students successfully completing this course will be able to execute common Linux commands and utilities; and accomplish system tasks such as navigating the file system, applying file system security, managing user accounts, using the printing environment, and utilizing the resources of a basic Linux system. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 231 Linux Administration* (3 Hours)
Prerequisites: IT 230

This course is designed to provide students with the necessary knowledge and skills to perform competently as a Linux system administrator. Students successfully completing this course should be able to perform basic system administration tasks including installing, configuring and troubleshooting a basic Linux system, managing devices, implementing the printing environment, installing software packages, and configuring the graphical user interface. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 232 Linux Networking* (4 Hours)
Prerequisites: IT 231

This course is designed to provide students with information that enhances their ability to manage Linux systems in a networked environment. Included are topics related to configuring and managing network connectivity, and the installation, configuration, and securing of network services. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 233 Linux Advanced Administration (4 Hours)
This course is designed to provide students with the skills and techniques to perform advanced administration tasks in a networked Linux environment. Topics will include compiling the Linux kernel, configuring advanced storage solutions, customizing system startup processes, and managing advanced network connections. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 245 Network Infrastructure* (3 Hours)
Prerequisites: IT 221

This course is designed to provide an in-depth understanding of the ability to install, manage, monitor, configure and troubleshoot DNS, DHCP, Remote Access, Network Protocols, IP Routing and WINS in a Windows 2000 network infrastructure. In addition, it will provide an in-depth understanding of the ability to manage, monitor and troubleshoot Network Address Translation and Certificate Services. Laboratory exercises will accompany the lectures. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 247 Accessing Wide Area Networks* (3 Hours)
Prerequisites: IT 145 and IT 209

The goal is to develop an understanding of various Wide Area Network (WAN) technologies to connect medium-size business networks. The course focuses on WAN technologies including Point-to-Point Protocol (PPP), Frame Relay and broadband links. WAN security concepts are discussed in detail, including types of threats, how to analyze network vulnerabilities, and general methods for mitigating common security threats. The course explains the principles of Access Control Lists (ACLs) and describes how to implement IP addressing services for an enterprise network, including Network Address Translation (NAT) and Dynamic Host Configuration Protocol (DHCP). IPv6 addressing concepts are also discussed. Finally, students learn how to troubleshoot and correct common network implementation issues. 2 hrs. lecture, 3 hrs. lab/wk.

IT 249 Advanced Routing* (3 Hours)
Prerequisites: IT 247

This course provides advanced instruction of Cisco routers found in medium to large networks. It is intended for students preparing for advanced Cisco certification. Upon completion of this course, the student will be able to select and implement the appropriate Cisco services required to build a scalable router network. Topics covered include extending IP addressing, implementing OSPF for a single area and multiple areas, configuring EIGRP, and implementing BGP. This course will follow semester five in the Cisco Networking Academy curriculum. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 250 Networking Seminar* (3 Hours)
Prerequisites: IT 225 and IT 247

This course is designed to teach advanced concepts in information technology. Topics covered are section specific and include e-mail servers, Web servers, database servers, routing, switching and advanced LAN design concepts. Prerequisites are posted for each section. Students may use this course as a capstone for applying concepts and procedures developed in previous courses using realistic business scenarios. 2 hrs. lecture, 2 hrs. instructional lab, 1 hr. open lab/wk.

IT 251 Network Security Fundamentals* (4 Hours)
Prerequisites: IT 247

This course is designed to provide students with a fundamental understanding of network security principles and implementation. Topics covered include authentication, the types of attacks and malicious code that may be used against computer networks, the threats and countermeasures for e-mail, Web applications, remote access, and file and print services. A variety of security topologies will be discussed as well as technologies and concepts used for providing secure communication channels, secure internetworking devices, intrusion detection systems, and firewalls. Hands-on exercises will be used to reinforce the concepts. 3 hrs. lecture, 2 hrs. open lab/wk.

IT 253 Advanced Switching* (3 Hours)
Prerequisites: IT 247

This course provides advanced instruction of Cisco switches found in medium to large networks. It introduces students to the deployment of the state-of-the art campus Local Area Networks (LAN). The course focuses on the selection and implementation of the appropriate Cisco Internetworking Operating System (IOS) services to build reliable scalable multilayer-switches LANs. Students will develop skills with Virtual LANs (VLAN), Virtual Trunking Protocol (VTP), Spanning Tree Protocol (STP), inter-VLAN routing, redundancy, Quality of Service (QoS) issues, campus LAN security, and transparent LAN services. 3 hrs. lecture, 2 hrs. open lab/wk.

IT 256 Windows Security* (4 Hours)
Prerequisites: IT 225 and IT 245

This course is designed to provide students with the skills and techniques to properly secure a Windows network. The topics will include building a Windows Active Directory infrastructure, securing the Windows Active Directory infrastructure and penetrating the infrastructure with current hacking tool kits. This course serves as a capstone course in the Windows track of the Information Technology Department. It is the last course in a series of six Windows classes. It takes concepts and skills learned in the pre-requisite Windows courses and ties them together focusing on securing a Windows network. 3 hrs. lecture, 2 hrs. open lab/wk.

IT 271 Information Technology Internship I* (3 Hours)
Prerequisites: IT 210 or IT 221 or IT 230 and department approval

This course affords the student the opportunity to apply classroom knowledge to an actual work environment. It will provide advanced information technology students with appropriate on-the-job experience with area employers, under instructional oversight, which will promote the student’s career goals. Student will work a total of 300 hours a semester at an approved job site.

IT 272 Information Technology Internship II* (3 Hours)
Prerequisites: IT 271 and department approval

This course is a continuation of IT 271, Internship I. It provides the student additional opportunity to apply classroom knowledge to an actual work environment. Students will work a total of 300 hours per semester at an approved job site.

IT 292 Special Topics:* (1-3 Hour)
Prerequisites: Department approval

This course periodically presents specialized topics in computer networking that are not available in the regularly offered curriculum. Special Topics may be repeated for credit; but only on different topics.