

Information Technology— Network Security Specialist

Associate in Applied Science Degree

Information Technology Program Cluster

Center for Agriscience and Technologies

Program offered at Madison Campuses

For information call: (608) 246-6800 or
(800) 322-6282 Ext. 6800

About the Program

The Network Security Specialist Program provides comprehensive instruction in computing systems and networks that have an important impact on data confidentiality, integrity and availability. Emphasis is placed on vigilant security awareness throughout the curriculum. The program introduces the student to computer network threats and the appropriate incident response, to include defenses, countermeasures and computer forensics. Students are exposed to scenarios reflecting the legal and ethical issues associated with information security. Extensive hands-on labs build practical experience in configuring a variety of network operating systems, firewalls, virtual private networks (VPN), packet filters and intrusion detection systems (IDS) to maximize information security in the network.

Requirements for Admission

1. High school diploma, HSED, or GED with a minimum grade point average of 2.0 or equivalent
2. General knowledge of Microsoft Windows

NOTE: Students starting in the spring will take a minimum of 5 semesters to complete due to some courses being offered fall only or spring only.

Program Courses

10-107-111 Careers in IT 1 credit

Introduces students to the various careers available in the vast field of Information Technology and examines the Network Specialist, Programmer/Analyst, Web Programmer/Analyst, Computer Systems Administration Specialist and Security Specialist career paths. Students create an individualized career path plan as the capstone project for the course. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management).

10-107-175 Job Search Preparation 1 credit

Introduction to planning and organizing a job search in Information Technology. Activities include the development of a personalized job search plan, correspondence, resumé and portfolio. Prerequisite: IT students must have completed all IT courses in the first two semesters.

10-150-160 IT Security Awareness 3 credits

Provides a basic survey of the importance of IT security awareness and data confidentiality. This security awareness-training course walks users through every aspect of Information Security in a very broad, easy to understand way and explains to them the value of securing data, for both themselves and the organization. The class will introduce legislation, local, state and federal privacy policies and liability of individuals and institutions related to data confidentiality and integrity. The course will introduce risk management, security policies, and common threats and countermeasures. The course will also present best practices in access control and password policies.

Curriculum

The courses listed below outline the requirements for graduation for students entering this program in the 2011-2012 academic year. Requirements for graduation may vary depending on the semester in which a student is admitted to their program.

Current/continuing students should consult their degree progress report available through their student center account for specific graduation requirements. Program requirements are subject to change.

FIRST YEAR

First Semester		Credits	Hrs/week Lec-Lab
10-107-111	Careers in IT	1	1-0
10-150-160	IT Security Awareness	1	1-0
10-150-170	CCNA1&2: Networking Routing Basics	5	3-4
10-154-184	Windows Client	3	2-2
10-801-195	Written Communication	3	3-0
10-804-144	Math of Finance	3	3-0
Total		16	

Second Semester

10-150-172	CCNA3&4: Switching and WAN Access	3	2-2
10-152-104	Windows PowerShell	3	2-2
10-154-186	Windows Network Infrastructure	3	2-2
10-154-190	Linux Server	3	2-2
10-801-196	Oral/Interpersonal Communication	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Total		18	

SECOND YEAR

First Semester

10-107-175	Job Search Preparation	1	1-0
10-150-164	Penetration Testing/Network Defense *	3	2-2
10-150-185	Introduction to Computer Forensics *	3	2-2
10-152-105	Linux Shell *	3	2-2
10-801-197	Technical Reporting	3	3-0
10-809-166	Introduction to Ethics: Theory and Applications	3	3-0
Total		16	

Second Semester

10-150-193	Network Security Design **	3	2-2
10-150-194	Firewall/VPN Technologies **	3	2-2
10-150-196	Intrusion Detection Systems **	3	2-2
10-150-197	Network Security Internship **	3	2-2
10-809-197	Contemporary American Society	3	3-0
	Elective	3	E
Total		18	

Note: Students are assessed for correct placement in English or mathematics courses based on their scores on the COMPASS test or on completion of the appropriate prerequisite/s. Additionally, there may be courses in other subject areas that may use COMPASS scores as prerequisites when reading, writing, math, or critical thinking competencies are required.

Graduation Requirement

All prerequisite courses require the grade of C or better in prerequisite in Information Technology (150-, 152-, 154-, 107-) course(s). All Information Technology courses require a grade of C or better in order to graduate.

Recommended Electives

Electives must be associate degree (10-level) or college transfer (20-level) courses		
10-150-150	VOIP Convergence Fundamentals *	3 credits
10-150-176	Intermediate Networking *	3 credits
10-152-119	Intro to Programming with JavaScript	3 credits
10-154-188	Windows Active Directory *	3 credits

*Offered fall semester only

**Offered spring semester only



Program Courses (continued)

**10-150-164 Penetration Testing/
Network Defense 3 credits**

Introduces the network security specialist to the various methodologies for attacking a network. The student is introduced to the concepts, principles and techniques, supplemented by hands-on exercises for attacking and disabling a network. These methodologies are presented within the context of properly securing the network. The course emphasizes network attack methodologies with the emphasis on student use of network attack techniques and tools. Prerequisites: 10-150-172, 10-154-186, 10-154-190 and completion of or concurrent enrollment in 10-152-105.

**10-150-170 CCNA1&2: Networking and
Routing Basics 5 credits**

Introduction to Networking basics and routing with a focus on network terminology, protocols, local area networks (LANs), Open System Interconnection (OSI) model, cabling, routers and router programming, Ethernet, Internet Protocol (IP) addressing, subnetting, Variable Length Subnet Masking (VLSM), Classless Inter-Domain Routing (CIDR) and network standards. The student will develop skills on configuring a router, using the Cisco IOS Software, and configuring routing using static routes and routing protocols, including RIP version 1 & 2, EIGRP, and single area OSPF. Involves extensive lab work using router, switches, and simulations. NOTE: Must take 10-150-172: CCNA3&4 within one year of completion of 10-150-170 CCNA1&2. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management) and Reading score of - COMPASS 80 or higher and Math score of - COMPASS 40 or higher.

10-150-172 CCNA3&4: Switching & WAN Access 3 credits

A continuation of CCNA1&2, this course focuses on switching concepts and WAN access. Topics include Virtual LANs (VLANs), switch configuration, LAN and WAN network design, Rapid Spanning Tree Protocol, trunking, VLAN Trunking Protocol (VTP), access lists, Network Address Translation (NAT), DHCP, wide area networks (WANs), WAN connections (cable, DSL, Frame Relay, and leased lines), Quality of Service (QoS), VPN basics, and network monitoring. Prerequisites: 10-107-111 and 10-150-170 (must follow 10-150-170: CCNA1&2 within one year).

10-150-185 Introduction to Computer Forensics 3 credits

This course provides a broad overview of computer forensics and investigation tools and techniques. All major personal computer operating system architectures and disk structures will be discussed, as well as what computer forensic hardware and software tools are available. Other topics include the importance of digital evidence controls, how to process crime and incident scenes, the details of data acquisition, computer forensic analysis, email investigations, image file recovery, investigative report writing, and expert witness requirements. The course provides a range of laboratory and hands-on assignments that teach about theory as well as the practical application of computer forensic investigation. Prerequisites: 10-150-172, 10-154-186, 10-154-190 and completion of or concurrent enrollment in 10-152-105.

10-150-193 Network Security Design 3 credits

This course affords the network security specialist the opportunity to design a secure network in a team environment using the skills learned from the prerequisite classes. The student must demonstrate the ability to design, plan and execute an infrastructure that represents the services offered by a common business or organization. The student will research their part of the design and must prepare written document including notes, diagrams, references, and implementation instructions of their part of the total design. Prerequisites: 10-150-164 and completion of or concurrent enrollment in 10-150-196.

10-150-194 Firewall/VPN Technologies 3 credits

Introduces the network security specialist to the various methodologies for defending a network. Students are introduced to the concepts, principles, types and topologies of firewalls to include packet filtering, proxy firewalls, application gateways, circuit gateways and stateful inspection. Students also learn the skills necessary for one of the CISCO Certified Security Professional (CCSP) certification exams. Prerequisite: 10-150-172

10-150-196 Intrusion Detection Systems 3 credits

This course introduces the basics of Intrusion Detection and network defense strategies. The student will be introduced to the tools and techniques used to identify network threats and recommended ways to mitigate those threats. The student must demonstrate the ability to plan, design, and build a network IDS that fulfills the security needs of a common business or organization. Prerequisites: 10-150-164, 10-152-105 and completion of or concurrent enrollment in 10-154-194.

10-150-197 Network Security Internship 3 credits

An on-the-job experience in Madison area companies that maintain, manage and secure computer networks. The emphasis is on hands-on design, installation, configuration, management, documentation, troubleshooting, maintenance and securing of LANs. By consent of instructor, a special project may be substituted for the internship. Prerequisites: 10-107-175, 10-150-164, 10-150-185, and 10-152-105.

10-152-104 Windows PowerShell 3 credits

Windows PowerShell is used in the Microsoft world for administration and management of Windows Clients. This class will introduce IT students to PowerShell and how it is used for administering Microsoft Networks. Students will develop a sound understanding of administering Windows environments using PowerShell and developing scripts using basic programming logic. Prerequisite: 10-154-184.

10-152-105 Linux Shell 3 credits

This course is designed to introduce students who have basic knowledge of the Linux operating system to advanced command line techniques. During the course students will develop the ability to construct both single line and multi line reusable script files. Students will be required to automate simple tasks using the shell. Prerequisite: 10-152-104 and 10-154-190.

10-154-184 Windows Client 3 credits

Learn how to install, configure and administer a Windows desktop operating system. Work in a computer laboratory setting to develop the real-world expertise needed to set up and support the Windows desktop environment. As you progress through topics such as installing the operating system, configuring hardware devices and establishing network connectivity, you are also preparing for Microsoft Exam 70-620. As an added bonus you will learn the operation of VMWare Workstation. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management) and Reading score of - COMPASS 80 or higher and Math score of - COMPASS 40 or higher.

10-154-186 Windows Network Infrastructure 3 credits

Gain the skills necessary for supporting and configure a Windows Network infrastructure including name resolution, file and print services, and remote access. Learn the practical skills required to troubleshoot and monitor network problems while preparing for Microsoft MCTS Exam 70-642. Prerequisites: 10-107-111, and 10-154-184 and completion or concurrent enrollment in one of the following: 10-150-101 or 10-150-170.

10-154-190 Linux Server 3 credits

Introduces Linux with a focus on system administration skills. Topics include installation, file and directory management, command execution, input/output redirection and pipes, shell scripts, network services, security, troubleshooting and the X Window system. Prerequisite: 10-150-101 or 10-150-170.

Career Potential:

Entry level positions can include:

- Network Control Operator
- Network Support Technician
- Network Support Services
- Network Technician
- Network Specialist
- Network Professional
- Networking Services
- Assistant LAN Manager
- Assistant LAN Administrator
- Assistant Network Administrator

With experience, networking specialist can find work as:

- LAN Manager
- LAN Administrator
- Network Support Services Manager
- Network Engineer
- Network Administrator
- Web Designer

Upper Management positions can include:

- Networking Manager
- Manager of Voice/Data Networks
- Intranet (sic) Designer
- Data Communications Analyst
- Director of Networks
- Network Security Specialist
- Cyber Security Professional

More detailed and updated information on this program may be available at: madisoncollege.org. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.