

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

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.

10-150-162 Computer Systems Security 3 credits
Introduces the basics of network security. The student is introduced to computer network vulnerabilities and threats and how to safeguard computer networks from those vulnerabilities and threats. This course exposes the student to network security planning, network security technology, network security organization and the legal and ethical issues associated with network security. Students learn the skills necessary for Security+ certification. Prerequisites: 10-150-160, 10-154-186 and one of the following: 10-150-101 or 10-150-170.

Curriculum

FIRST YEAR		Hrs/week	
First Semester	Credits	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.....	3	2-2
10-152-150	Introduction to Perl Programming.....	3	2-2
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		17	

Second Semester		Hrs/week	
10-150-172	CCNA3&4: Switching and WAN Access	3	2-2
10-152-151	Scripting with Perl	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		Hrs/week	
10-107-175	Job Search Preparation.....	1	1-0
10-150-162	Computer Systems Security.....	3	2-2
10-150-164	Penetration Testing/Network Defense*	3	2-2
10-150-185	Introduction to Computer Forensics*.....	3	2-2
10-150-194	Firewall/VPN Technologies*.....	3	2-2
10-809-166	Introduction to Ethics: Theory and Application.....	3	3-0
Total		16	

Second Semester		Hrs/week	
10-150-193	Network Security Design**.....	3	2-2
10-150-196	Intrusion Detection Systems**.....	3	2-2
10-150-197	Network Security Internship**.....	3	2-2
10-801-197	Technical Reporting.....	3	3-0
10-809-197	Contemporary American Society.....	3	3-0
	<u>Elective</u>	<u>3</u>	<u>E</u>
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 (100 level) or college transfer (200-level) courses		
10-107-159	IT Project Management	3 credits
10-152-119	Intro to Programming with Javascript	3 credits
10-152-124	Introduction to Database	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: 10-150-162 and 10-154-190.

**10-150-170 CCNA1&2: Networking and
Routing Basics 3 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).

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 and 10-154-190.

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 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, 10-150-194 and 10-154-190.

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, 10-150-162, 10-150-164, 10-150-185 and 10-150-194.

10-152-150 Introduction to Perl Programming 3 credits

This course is design to introduce students who are non-programming Information Technology majors to scripting. During the course students will develop sound scripting skills for solving common business problems. Stressing structured programming and modular design, this course uses Pseudo code as the major program design technique. This course emphasis programming of scripts using the Perl programming language. Students will be required to complete simple to compound scripting assignments. This course is a prerequisite course for Scripting with Perl. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management).

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.

Additional Required Program Courses

10-150-160	IT Security Awareness	1 credit
10-152-151	Scripting with Perl	3 credits
10-154-184	Windows Client	3 credits

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: matcmadison.edu. 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.