

MCC's AAS Degree in Information Assurance/3010 - 63 credits

Program Prerequisites: CCL Network Administration Novell/5122 (26-28 credits)
 or CCL Network Administration Unix-Solaris/5123 (29-31 credits)
 or CCL Network Administration Microsoft Windows 2000/5124 (28-31 credits)
 or Departmental approval and CRE 101 - Critical and Evaluative Reading (3)

I. General Studies Core Areas (12 - 14 Credits)	<i>Credits</i>
English	6
ENG101 - First Year Composition (3)	
ENG102 - First Year Composition (3)	
Communication	3
COM 100 - Introduction to Human Communication	
or COM225 - Public Speaking (3)	
or COM230 - Small Group Communication (3)	
Mathematics	3-5
MAT150 - College Algebra Concepts (5)	
or MAT151 - College Algebra (4)	
or MAT152 - College Algebra (3)	
II. General Studies Distribution Area (10 Credits)	
Humanities and Fine Arts	3
PHI214 - Business Ethics (3)	
or any approved General Studies courses in the Humanities and Fine Arts	
Social Behavioral Science	3
ECN111 - Microeconomic Principles (3)	
or ECN112 - Microeconomic Principles	
Natural Science	4
PHY101 - Introduction to Physics	
III. Core Courses (26 credits)	
Required courses (26 credits)	
CIS247DA - Cyber Forensics and Incident Handling	3
CIS271DA - Security Certified Professional (SCP)-Hardening the Infrastructure	3
CIS272DA - Security Certified Professional (SCP)-Network Defense and Countermeasures	3
CIS247DL - Legal Issues of Information Assurance	3
CIS273DA - Information Audit and Risk Analysis	3
CIS279DA - Practical Applications in Information Assurance	4
CIS238US - UNIX Security	3
or CIS271DL - Linux Security	
CIS273DC - Data Assurance and Disaster Recovery	3
Restrictive electives (select 15 -16 credits)	
CNT185 - Cisco Network Security	4
CNT186 - Fundamentals of Wireless LAN's	4
CNT230 - Cisco Network Troubleshooting (4)	3-4
or MST259 - Designing Windows Network Security (3)	
CIS 245 - Novell Netware Advanced System Administration	3
CIS 175CG - Designing a Secure Microsoft Windows 2000 Network	3
CNT170 - Cisco Wide Area Networks (WAN) Technologies	3
CIS 238 - Advanced UNIX Systems Administration	3
CIS 273DB - Digital Authentication and Public Key Infrastructure (PKI)	3
CIS 290AC - Computer Information Systems Internship (3)	3
or CIS 298AC - Special Projects (3)	

MCC's Certificates of Completion

■ *Certificate of Completion: Network Security/5188 - 26 credits*

Certificate Prerequisites: CCL Network Administration: Cisco/5205 (30-31 credits)
 CCL Network Administration Unix-Solaris/5123 (30-31 credits)
 CCL Network Administration Microsoft Windows 2000/5124 (26-28 credits)
 CCL Network Administration Microsoft Windows NT/5120 (29-30 credits)
 CCL Network Administration Novell/5122 (30-31 credits)

<i>Course Name</i>	<i>Credits</i>
CIS270 - Essentials of Networking & Information Security	3
CNT185 - Cisco Network Security	4
CNT186 - Fundamentals of Wireless LANs	4
CIS175CG - Designing a Secure Microsoft Windows 2000 Network	3
or MST259 - Windows Network Security (3)	
CIS238US - UNIX Security	3
CIS271DA - Security Certified Professional (SCP) - Hardening the Infrastructure	3
CIS272DA - Security Certified Professional (SCP) - Network Defense & Countermeasures	3
PHI214 - Business Ethics	3

■ *Certificate of Completion: Information Assurance/5227 - 19 credits*

Certificate Prerequisites: CCL in Network Security /5188 (30-31 credits)

<i>Course Name</i>	<i>Credits</i>
CIS247DA - Cyber Forensics and Incident Handling	3
CIS247DL - Legal Issues of Information Assurance	3
CIS273DA - Information Audit & Risk Analysis	3
CIS273DB - Digital Authentication and Public Key Infrastructure (PKI)	4
CIS273DC - Data Assurance and Disaster Recovery	3
CIS279DA - Practical Applications in Information Assurance	4

■ *Certificate of Completion: Cyber Forensics Technician/5228 - 38 credits*

Certificate Prerequisites: CRE 101 - Critical and Evaluative Reading (3) and CIS 105 - Survey of Information Systems (3) or department approval.

<i>Course Name</i>	<i>Credits</i>
BPC170 - Microcomputer Maintenance I	3
BPC273 - Advanced Server Computer Maintenance: Server + Prep (Networking Systems)	3
CIS109AM - Networking Technology I(Windows XP)	2
MST152 - Microsoft Windows 2000 Server	4
CIS126 - UNIX operating system (note: any module)	1-3
CIS238 - Advanced UNIX Systems Administration	3
CNT140 - Cisco Networking Basics	4
CIS270 - Essentials of Networking and Information Security	3
CIS247DL - Legal Issues in Information Assurance	3
CIS247DA - Cyber Forensics and Incident Handling	3
CIS247DB - Advanced Cyber Forensics	3
CIS279DC - Moot Court and Practical Applications in Cyber Forensics	4

Call to Register: 480-461-6100

Course Descriptions

BPC170	Microcomputer Maintenance I	3 Credits
Technical aspects of the microcomputer, including system setup (hardware and software) and basic troubleshooting. Emphasizes troubleshooting, use of tools, hardware components and hardware and software interfaces, and operating systems. Students use Cisco certified course IT Essentials I. Course content prepares students for Computer Technology Industry Association (CompTIA) A+ certification exam. PR: None.		
BPC273	Advanced Server Computer Maintenance: Server + Prep (Networking Systems)	3 Credits
Focuses on complex technical aspects of the microcomputer server, including server operating installation, configuration, and trouble-shooting. Preparation for the CompTIA Server+ and Linux+ examinations PR: CIS105 or department approval.		
CIS109AM	Networking Technology I (Windows XP)	2 Credits
Computer networking basics. Network services, transmission media, and connectivity devices covered. Open Systems Interconnection (OSI) Reference Model emphasized. PR: None.		
CIS126AA	UNIX Operating System Level I	1 Credit
Use of the UNIX operating system: system components, built-in commands, files and directories, editors and UNIX Shell and command lines. No open labs for this class. This is on-line distance learning. You must have Internet access and meet CBT (Computer- Based-Training) system requirements. PR: CIS105. CBT courses are closed to registration. To register call 480-461-6100.		
CIS126AL	Linux Operating System I	1 Credit
Introduction to the Linux Operating system. Develop knowledge and skills required to install, configure a Linux-based workstation including basic network functions. PR: None.		
CIS126BL	Linux Operating System II	1 Credit
Introduction to the Linux Operating system. Develop knowledge and skills required to configure a Linux-based workstation including basic printing functions. Learn basic command line and Graphical User Interface (GUI) desktop environment utilities and applications. PR: CIS126AL or department approval.		
CIS126CL	Linux Operating System III	1 Credit
Introduction to the Linux Operating system. Develop knowledge and skills required to install and configure applications and to troubleshoot a Linux-based workstation, including basic network functions. Learn basic command line and Graphical User Interface (GUI) desktop environment utilities and applications. PR: CIS126BL or department approval.		
CIS126DA	UNIX Operating Systems Sun Sponsored	3 Credits
Introduction to the UNIX operating system for end users and is complementary to the other Cisco networking courses, such as routing and switching. Broadens the skills of Cisco academy students to include a major network operating system. Provides a strong foundation for those who wish to move on to more advanced courses in Unix system administration. Familiarizes students with the powerful UNIX command line utilities and the graphical Common Desktop Environment (CDE). PR: CIS105.		
CIS126DL	Linux Operating System	3 Credits
Introduction to the Linux Operating system. Develop knowledge and skills required to install, configure and troubleshoot a Linux-based workstation, including basic network functions. Learn basic command line and Graphical User Interface (GUI) desktop environment utilities and applications. Fundamentals covered to achieve the entry-level industry certification. PR: CIS105 recommended.		
CIS175CG	Designing a Secure Microsoft Windows 2000 Network	3 Credits
Implementation of Windows 2000 networking components to create a more secure computing environment. Through the use of case examples and "mini-design" projects, students will evaluate alternatives leading to a more secure network design. Topics include: administrative control and security; local and remote-access user authentication and security; file-level security and encryption; laptop and desktop security; implementing IPSec and PKI for security; securing data flow through a DMZ; and designing a security plan. Covers material for Microsoft 70-220 exam. PR: MST152 and all other prerequisites associated with this class and/or department approval.		
CIS238	Advanced UNIX Systems Administration	3 Credits
Basic system management tasks of Solaris UNIX. Other UNIX systems are covered in lecture. Lab exercises are done on Solaris™ UNIX. Topics include: installing an operating system, imaging filesystems, configuring peripherals, security, monitoring system performance, networking with TCP/IP, troubleshooting problems. PR: CIS126DA (Solaris™/Unix course).		
CIS238US	UNIX Security	3 Credits
Unix system administration and security management including directory structure, access control and authentication mechanisms, password management, system logs and monitoring, process accounting, configuring public services, restricted environments, the sudo command, SSH (Secure Shell), file system mount options, file integrity management, immutable/append-only files and system security levels, loadable kernel modules, rootkits, non-executable stacks, backups, common vulnerabilities and exposures, and firewall filtering. PR: CIS238, or department approval.		

What is Information Assurance?

Information Assurance encompasses those "operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities."

The relatively new position of security analyst, also known as security administrator, is critical to a company's well-being and can potentially prevent the loss of millions in corporate dollars. This tech professional is the protection agent against hackers and intruders that seek to harm an organization's computer network and/or files. Information Assurance (IA) is an increasingly important requirement for Information Technology professionals today and for those who process or deal with information in any of its aspects. IA issues are of increasing importance in business and government agencies today, especially since September 11.

Mesa Community College has developed the Information Assurance Program to serve information users and managers in the greater Phoenix area. The Information Assurance Program provides any interested student with solid knowledge and skills in information security. The Information Assurance Program builds on network administration and database administration skills acquired through experience and/or course work for certificates and degree programs offered at MCC or any Maricopa Community College.

The program consists of three certificates and an AAS Degree: **(1) The Certificate of completion in Network Security** builds on the skills of a network administrator and prepares students for entrance into the **(2) Certificate Program in Information Assurance**. The **(3) Cyber Forensics Technician certificate program** is available for any student with some course work in networking. The course work required for these certificates is applied towards an **AAS degree in Information Assurance**.

Who should enroll in MCC's Information Assurance Program?

Due to the shortage of qualified people in the IA workforce, individuals enrolling in the IA program now have an opportunity to get in on the ground floor. The IA program is an excellent opportunity for students pursuing certifications and degrees in network administration to enhance their employability quotient!

According to ComputerJobs.com, during 2002 there were 109,336 unique IT jobs posted by employers. Security pros fared better than other high-tech workers according to Computerworld.com. Salaries for corporate security positions increased from the first quarter of 2001 to the first quarter of 2002 by an average of 3.1%, while bonuses increased 9.5%. For example, only 3,000 Computer Information Systems Security Professionals currently exist across the nation, so the market is wide open. Average salaries nationwide for entry-level positions start at \$54,090 and go up to \$75,043 with 6-9 years experience.

NewsFactor Network's February 28, 2003 issue, quoted CEO John Challenger, of outplacement firm Challenger, Gray & Christmas, saying information security specialists will be among the most sought-after and well paid tech workers in 2003. "There are a lot of companies that haven't been really damaged yet and that are lacking in their systems, and there are a lot of companies that are adding to their (systems arsenal)." "That creates a real need."

Internet Security

Countermeasures

Intrusion

Covert

RISK ANALYSIS

ENCRYPTION

Intrusion Detection



Attack

Authentication

Cyber Crime

Tracing Vulnerability
Network Forensics
Digital Signatures



Standards

Data Protection

Course Descriptions...continued

- CIS245 Novell Netware Advanced System Administration 3 Credits**
Knowledge and skills needed to design, configure and administer a complex Netware 6 network. Students learn server installation and maintenance through hands-on labs. Prepares students for the test associated with Novell course 3004 Novell Network Management Exam: 50-681. PR: CIS105, BPC170, CIS109, CIS190 or CNT140 and CIS191.
- CIS247DA Cyber Forensics and Incident Handling 3 Credits**
Forensic and advanced incident handling techniques in a lab setting with hands-on skills in incident response, forensic preparation, Windows forensics, Linux forensics, data recovery and analysis, malicious code analysis, law enforcement interaction and case law, corporate and managerial legal concerns and direction. Helps prepare students for GIAC Certified Forensic Analyst (GCFA) Certification and IACIS Certified Forensic Computer Examiner (CFCE) certification. PR: CIS270.
- CIS247DB Advanced Cyber Forensics 3 Credits**
Advanced forensic and incident handling techniques in a lab setting with classroom instruction and hands-on skills in incident response, forensic preparation, evidence preservation and acquisition, examination protocol, introduction to automated forensic tools, law enforcement interaction and case law, corporate and managerial legal concerns and direction. PR: CIS247DA.
- CIS247DL Legal Issues of Information Assurance 3 Credits**
Legal implications of organizational computing policies, interaction with legal counsel and law enforcement, evidence collection and preservation, risk management of liability, and loss of property and risk mitigation through assurance. PR: CIS270 or department approval.
- CIS270 Essentials of Networking and Information Security 3 Credits**
Addresses threats to security of information systems; responsibilities and basic tools for information security, including communication security, infrastructure security, organizational security and basic cryptography. Introduction to the language of network security and hardware, software and firmware components of an information security system for local, metropolitan, enterprise, and wide area networks. Helps prepare students for the CompTIA Security+ exam and the GIAC Security Essentials Certificate (GSEC). PR: CNT150, or CIS175DB or MST150 any module, or department approval.
- CIS271DA Security Certified Professional (SCP) - Hardening the Infrastructure 3 Credits**
Network security-related fundamentals, issues, and skills for systems administrators to implement network security. Includes network security basics, advanced TCP/IP, IP packet structure and analysis, routing and access control lists, securing Windows computers, securing Linux computers, Internet security, and hacker attack techniques. Together with CIS272DA prepares students for the Security Certified Network Professional Level I exam. PR: CIS270, CNT150 and CIS175DB or department approval.
- CIS271DL Linux Security 3 Credits**
Implementing in-depth security methods and techniques in a Linux-based network environment. Utilize programs, utilities and configuration techniques to provide user-level, file system, and network security. Gain knowledge in a variety of security cracking techniques and how to guard against them. In all aspects of security, the standard of practicing professional ethics seriously emphasized. Preparation for industry certifications such as the SAIR/GNU LCP and LCA certificates, CompTIA's Linux+, RHCT, RHCE, and LPIC. PR: CIS240DL or department approval.
- CIS272DA Security Certified Professional (SCP) - Network Defense and Countermeasures 3 Credits**
Architecture of network defense and skills for system administrators to implement network defense. Includes network defense fundamentals, designing and configuring firewalls, configuring Virtual Private Networks (VPNs), designing and configuring an IDS, analyzing intrusion signatures, performing risk analysis, and creating a security policy. Together with CIS271DA prepares students for the Security Certified Network Professional Level I exam. PR: CIS271DA or department approval.
- CIS273DA Information Audit and Risk Analysis 3 Credits**
Knowledge, skills, and abilities in basic risk analysis techniques to secure information and to conduct a technical audit of essential information systems. Prepares students for the GIAC Systems and Network Auditor certification. PR: CIS272DA or department approval.
- CIS273DB Digital Authentication and Public Key Infrastructure (PKI) 3 Credits**
Knowledge and skills necessary to plan and implement PKI (Public Key Infrastructure) and Digital Authentication security methods and biometrics. Preparation for Security Certified.net certification examination, Security Certified Network Architect (SCNA). PR: CIS272DA or department approval.
- CIS273DC Data Assurance and Disaster Recovery 3 Credits**
Security and protection of data with emphasis on physical security of data servers and storage, disaster recovery plan and procedures, backup management and procedures, business continuity planning for unusual conditions, data confidentiality, integrity, and assurance, data retention policy and procedures, data warehouse, data use authorization and authentication, securing data in the mobile environment, handling data in response to cyber crime, data risk identification and assessment, and user education in and awareness of data assurance. PR: CNT185 or CIS271DA or department approval.

Course Descriptions ...continued

- CIS279DA Practical Applications in Information Assurance 4 Credits**
Practical experience in applying core skills and knowledge in information assurance to real-world scenarios or simulations of information security vulnerabilities comparable to the Global Information Assurance Certifications (GIAC) simulation exercises. PR: CIS272DA and CIS247DA and CIS273DA and CIS273DC, or department approval.
- CIS279DC Moot Court and Practical Applications in Cyber Forensics 4 Credits**
Practical experience in applying cyber-forensic tools and techniques through simulated initial response, victim/witness interviews, search and seizure execution, evidence handling and logging, secure data duplication and analyses, report writing, final case preparation and presentation. Includes standard operating procedures, handling of at-risk media, and cyber-crime terminology. PR: CIS247DA and CIS247DB.
- CIS290AC Computer Information Systems Internship 3 Credits**
Work experience in business or industry. PR: Department approval. Cross-References: BPC290AC.
- CIS298AC Special Projects 3 Credits**
Organized and tailored around the interests and needs of the individual student. Structured to provide an atmosphere of individualized research and study paralleled by professional expertise and guidance. Professional-type facilities and equipment available for student use. Allows the best aspects of independent study and individualized learning to be combined to maximize student development. PR: None.
- CNT140 Cisco Networking Basics 4 Credits**
Introduction to the computer networking field. Covers network terminology and protocols, local area networks (LAN), and wide area networks (WAN). Includes Open Systems Interconnection (OSI) models, cabling and cabling tools, routers, router programming, Ethernet, Internet Protocol (IP) addressing, and network standards. First of four courses preparing for CCNA certification or first of two courses preparing for Cisco CCNA INTRO test. PR: None.
- CNT170 Cisco Wide Area Networks (WAN) Technologies 3 Credits**
Advanced Internet Protocol (IP) addressing techniques including Network Address Translation (NAT) Port Address Translation (PAT) and Dynamic Host Control Protocol (DHCP). Also covers Wide Area Network (WAN) technology and terminology, Point-to-Point Protocol (PPP), Integrated Services Digital Network (ISDN), Dial on Demand Routing (DDR), Frame Relay, and network management. Fourth of four courses preparing for CCNA certification exam or second of two courses preparing for Cisco CCNA ICND exam. PR: CNT160 or department approval.
- CNT185 Cisco Network Security 4 Credits**
Applications of Cisco Networking technologies in designing and implementing security solutions to reduce risk of revenue loss and vulnerability. Hands-on experience and skills in security policy design and management, security technologies, products and solutions, firewall and secure router design, installation, configuration and maintenance, AAA (Authentication, Authorization, and Accounting) and VPN (Virtual Private Network) implementation using firewalls and routers. Preparation for the MCNS (Managing Cisco Network Security) and CSPFA (Cisco Secure PIX Firewall Advanced) exams toward certification as a Cisco Firewall Specialist. Exams also apply to CCSP (Cisco Certified Security Professional) certification. PR: CNT170, or current CCNA certification or department approval.
- CNT186 Fundamentals of Wireless LANs 4 Credits**
Design, planning, implementation, operation, and troubleshooting of wireless networks. Overview of technologies, security, and design best practices with emphasis on hands-on skills in wireless LAN (local area network) setup and troubleshooting, 802.11a & 802.11b technologies, products and solutions, site surveys, resilient WLAN design, installation and configuration, WLAN Security - 802.1x, EAP (Extensible Authentication Protocol), LEAP (Light Extensible Authentication Protocol), WEP (Wired Equivalent Privacy), SSID (Service Set Identifier), and vendor interoperability strategies. Prepare students to earn Cisco Wireless LAN Support Specialist designation and to take the Certified Wireless Network Administrator (CWNA) exam. PR: CNT150, or department approval.
- CNT230 Cisco Network Troubleshooting 4 Credits**
Emphasis on troubleshooting complex network problems by focusing on documenting and baselining a network, utilizing troubleshooting methodologies and tools, and learning effective skills in Layer 1 to 7 troubleshooting. Preparation for the last of four exams leading to the Cisco Certified Network Professional (CCNP) certification. PR: CNT200 and CNT210 and CNT220, or CCNP Advanced Routing, Remote Access, and Multi-Layer Switching Certification, or department approval.
- MST152 Microsoft Windows 2000 Server 4 Credits**
Installation, configuration and administration of Microsoft Windows 2000 Server in an Active Directory domain environment. The course also emphasizes installation, configuration and administration of network services, including: TCP/IP and other network protocols, Dynamic TCP/IP Configuration Services (DHCP), Name Resolution (DNS and WINS), Routing and Remote Access Services (RRAS), Printer Administration, Terminal Services, Web, Telnet and FTP Services. Covers material for Microsoft exam 70-215. PR: CIS175DB and all other prerequisites associated with this class and/or department approval.

Call to see an advisor: 480-461-6106

Visit <http://www.dist.maricopa.edu/academic/curric/crsinfo.html> for general study course descriptions

Information Assurance

"IT and security market to double in size by 2006!" IDC

■ MCC Certificates:

- Network Security
- Information Assurance
- Cyber Forensics Technician



■ AAS Degree in Information Assurance

■ Professional Courses in Network Security Certification

- Security Certified Professional Exam Preparation
- Sun Certified Security Specialist Courses



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The Maricopa Community College District is an EEO/AA institution.