

Subject	Type
<u>Network Administration &amp; Security</u>	Associate of Applied Science

## Suggested Course Schedule

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### First Year:

Course #	Course Description	Fall	Spring
CSCI 105	Computer Fluency	3	
ITS 150	CCNA 1: Exploration	3	
ITS 165	OS Commands & Scripts	3	
M 115	Probability and Linear Mathematics	3	
WRIT 101	College Writing I	3	
	<b>Total</b>	<b>15</b>	
BGEN 105S	Intro to Sustainable Business		3

<i>Course #</i>	<i>Course Description</i>	<i>Fall</i>	<i>Spring</i>
CSCI 135	Fund of Computer Science I		3
CSCI 172	Introduction to Computer Modeling		3
ITS 210	Network OS - Desktop		3
ITS 280	Computer Repair & Maintenance		3
ITS 289	Professional Certification A+		1
	<b>Total</b>		<b>16</b>

**Second Year:**

<i>Course #</i>	<i>Course Description</i>	<i>Fall</i>	<i>Spring</i>
COMX 111A	Oral Communications	3	
CSCI 215E	Ethics in Computer Science	3	

<i>Course #</i>	<i>Course Description</i>	<i>Fall</i>	<i>Spring</i>
ITS 152	CCNA 2: Exploration	3	
ITS 212	Network O.S. – Server Admin	3	
ITS 222	Enterprise Security	3	
	<b>Total</b>	<b>16</b>	
ITS 214	Network O.S. – Infrastructure		3
ITS 222	Security Elective**		4
ITS 250	CCNA 3: Exploration		3
ITS 252	CCNA 4: Exploration		3
ITS 298	Internship		2
	<b>Total</b>		<b>15</b>

**Total Credits: 60**

*\*This recommended schedule may not be appropriate for all students.*

**\*\*Students can choose 1 from the following for an approved Security Elective:**

- ITS 275 Border/Perimeter Network Security
- ITS 277 Software Assurance and File System Internals
- ITS 271 Securing Desktop and Mobile Devices
- ITS 273 Securing LANs

Helpful Links

- [Advising Checklist](#)
- [Prereq. Flowchart](#)
- [Industry Certifications](#)
- [Internships](#)
- [Apply](#)

## Course Descriptions

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**BGEN 105S Introduction to Business, 3 cr.** *Offered every term.* Same as BUS 103S. Nature of business enterprise; role of business in society; problems confronting business management; career opportunities in business. Open to non-business majors and business majors of freshman or sophomore standing only. Business majors are advised to register for the course their freshman year. Credit allowed for only one of BGEN 105S, MIS 100S, IS 100S, BADM 100S and BUS 103S.

**COMX 111A Oral Communications, 3 cr.** *Offered every term.* Introduction to techniques for preparing and delivering effective presentations as well as constructive criticism. Credit not allowed for both COM 160A and COMM 111A.

**CSCI 105 Computer Fluency, 3 cr.** *Offered autumn and spring.* Introduces the skills and concepts of information technology, both from practical and a more theoretical point of view. During lectures and interactive computer labs, students will explore a wide range of digital and information technologies, including common PC applications, networking, databases, privacy, and security. Credit not allowed for both CSCI 105 and CRT 111 and CS 111.

**CSCI 135 Fund of Computer Science I, 3 cr.** *Offered autumn and spring.* Prereq., computer programming experience in a language such as BASIC, Pascal, C, etc.; coreq., M 095 or consent of instr. CSCI 104 highly recommended as prereq. or coreq. Fundamental computer science concepts using the high level structured programming language, Java.

**CSCI 136 Fund of Computer Science II, 3 cr.** *Offered autumn and spring.* Prereq., CSCI 135; coreq., M 115 or M 151 or consent of instr. Continuation of CSCI 135. Survey of computer science topics including recursion, algorithms, basic data structures, operating systems, artificial intelligence, graphics, user interfaces, and social and ethical implications of computing.

**CSCI 172 Introduction to Computer Modeling, 3 cr.** *Offered autumn and spring.* Prereq., M 090. Problem solving and data modeling using computer productivity software. Emphasis using spreadsheets and database for data analysis. Credit not allowed for CSCI 172, CRT 172, and CS 172.

**CSCI 215E Social and Ethical Issues in CS, 3 cr.** *Offered autumn and spring.* Prereq., WRIT 101. Exploration of ethical issues in the field of computing. Skills needed to identify and analyze various ethical concerns. Standard ethical concepts and theories, methods of ethical analysis. Strong emphasis on practical application of the ethical process.

**CSCI 221 Systems Analysis and Design, 3 cr.** *Offered spring.* Prereq., CSCI 240. Analysis of the system development life cycle. Emphasis on planning, analyzing, designing, implementing and supporting information systems to meet business requirements. Covers feasibility studies, time and cost estimates, modeling tools, design tools, implementation and support strategies. A simulated business design project will be developed.

**CSCI 240 Database and SQL, 3 cr.** *Offered autumn.* Prereq., CSCI 172 or consent of instr. Relational database design including: requirements analysis, data structure, entity relationships, normalization, relational algebra and integrity. Physical implementation focusing on data storage; retrieval and modification; concurrency; optimization; security; SQL; and XML.

**ITS 150 CCNA 1: Exploration, 3 cr.** *Offered autumn and spring.* Prereq., M 090. Introduction to networking field including terminology; protocols; local-area and wide-area networks; the OSI model; topologies; IP addressing; cabling and cabling tools; routers and router programming. Ethernet and network standards; and wireless technologies.

**ITS 152 CCNA 2: Exploration, 3 cr.** *Offered spring.* Prereq., ITS 150. Covers router theory and technologies including configurations, IOS software management, routine protocol configuration, TCP/IP, access-lists and introduction to LAN switching.

**ITS 165 OS Commands & Scripts 3 cr.** *Offered spring.* Same as CRT 112. Prereq. M 090 and demonstrated computing experience. Introduction to operating system concepts through the use of contemporary software. Emphasizes file system management, networking, installation, maintenance, management, and disaster recovery practices using both the command interpreter and graphical user interface.

**ITS 210 Network Operating System – Desktop, 3 cr.** *Offered autumn.* Prereq., ITS 150. In-depth study of a secure, multi-user, client-based network operating system. Topics include installation, administration of resources, performance, network services, and security.

**ITS 212 Network Operating System – Server Admin, 3 cr.** *Offered autumn.* Prereq., ITS 150. Server technologies commonly used in local area networking. Topics include installation, administration, storage, application services, network services, security, reliability, and availability.

**ITS 214 Network Operating System – Infrastructure, 3 cr.** *Offered spring.* Prereq., ITS 210. Principles and implementation of enterprise networking services. Topics include Protocol Binding, DNS, DHCP, WINS, Remote Access, IP Routing, IP Security, Network Address Translation, and Certificate Services.

**ITS 222 Enterprise Security, 3 cr.** *Offered spring.* Prereq., ITS 210. Examination of general information technology security concepts. Topics include access control, authentication, attack methods, remote access, web security, wireless networks, cryptography, internal infrastructure security, and external attacks. Security procedures, organizational policies, risk management and disaster recovery addressed.

**ITS 250 CCNA 3: Exploration, 3 cr.** *Offered autumn.* Prereq., ITS 152. Covers router configurations including advanced IP addressing techniques, variable length subnet masking, intermediate routing protocols, Ethernet switching, virtual LANs, spanning-tree protocol, and VLAN trucking protocol.

**ITS 252 CCNA 4: Exploration, 3 cr.** *Offered spring.* Prereq., ITS 250. Project-based course in wide-area networking including advanced IP addressing techniques, network address translation, port address translation, DHCP, WAN technology and terminology, PPP, ISDN, DDR, Frame Relay, network management, and introduction to optical networking.

**ITS 271 - Securing Desktop/Mobile Devices 4 cr.** Course provides advanced technical information and relevant skills to successfully secure end-user devices, including desktop and laptop systems, tablets, cellular phones, and other portable computing equipment. Building on existing knowledge and skills in the areas of server management, network management, and security, students will gain mastery-level knowledge of security issues and best practices. Course content covers client/server exposures and protections (authentication options, packet signing and encryption of network traffic, appropriate implementation of permissions and rights); malware threats and treatments; transmission choices and precautions (wired, wireless, remote desktop access, virtual private networking (VPN)); cloud computing considerations; and corporate mobile device best practices. Hardening of the operating system and application software is also covered. Course content will focus on business-focused security practices to prepare students for Security+, CISSP, and Security Pro industry certifications. Prerequisite Skills: Course builds upon established skills in security, server management, and network management. Students should be working as a network manager or have completed appropriate skills-based coursework using MS Server 2008/2012 & Mware.

**ITS 273 - Securing Networks 4 cr.** Course provides advanced technical information and relevant skills to secure servers and business information. Building on existing knowledge and skills in the areas of server management, network management, and security, students will gain mastery-level knowledge of security issues and best practices. Students will examine and apply hardening techniques to operating systems and infrastructure-based applications. Strategies to ensure business continuity and data security are emphasized, including policy, data preservation, disaster preparedness, and disaster recovery. Legal guidelines and requirements, both domestic and international, are examined in the context of responsible and ethical computer use. Course content will focus on business-focused security practices to prepare students for the Security+, CISSP, and Security Pro industry certifications. Prerequisite Skills: Course builds upon established skills in security, server management, and network management. Students should be working as a network manager or have completed appropriate skills-based coursework using MS Server 2008/2012 & Mware.

**ITS 275 - Border/Perimeter Network Security 4 cr.** Course provides advanced technical information and relevant skills to successfully secure computer networks at the public/private interface. Material focuses on hardware- and software-based techniques to prevent and monitor unauthorized or malicious access to corporate networks and servers. Building on existing knowledge of border and perimeter security, students will develop and implement best practices guidelines for boundary-related devices and software. Students will establish baseline assessments of network security from public access points and identify known and/or potential security vulnerabilities. Course content will focus on business-focused security practices to prepare students for the Security+, CISSP, and Security Pro industry certifications. Prerequisite Skills: Course builds upon established skills in security, server management, and network management. Students should be working as a network manager or have completed appropriate skills-based coursework using MS Server 2008/2012 & Mware.

**ITS 277 - Software Assurance and File Systems 4 cr.** Course provides advanced technical information and relevant skills to methodically secure software, including operating systems, custom application software, and commercially-available packages. Students will classify application software (including, but not limited to customer-facing, employee/partner, mobile/endpoint, database, and cloud-based), and perform risk analyses and common weakness assessments against these programs. Students will research various commercial, professional, and governmental security organizations and create a personalized repository of security-related checklists, toolkits, reference material, and resources. Students will investigate low-level file system structures such as master file tables, allocation tables, free space tables, file table entries, and metadata fields. Using common file signatures and checksums, students will verify internal content against external and metadata indicators. Students will examine 'hidden' disk space areas, including file, volume, and/or partition slack. Course content will focus on business-focused security practices to prepare students for Security+, CISSP, and Security Pro industry certifications. Prerequisite Skills: Course builds upon established skills in security, server management, and network management. Students should be working as a network manager or have completed appropriate skills-based coursework using MS Server 2008/2012 & Mware.

**ITS 280 Computer Repair and Maintenance, 3 cr.** Offered autumn. Prereq., ITS 150. In-depth study of personal computer hardware. Focus on field replaceable components. Topics include: storage devices, processors, system boards, memory, ports, cabling, power supplies, multimedia devices, printers, and troubleshooting.

**ITS 289 Professional Certification, 1 cr.** Offered autumn and spring. Prereq., consent of instr. Review objectives of an information technology industry-based professional certification. Certification objectives, preparation strategies, and exam strategies included. Course can be repeated for different industry-based professional certifications.

**ITS 298 Internship/Cooperative Education, 2 cr.** Offered autumn and spring. Not open to non-majors. On-the-job training in positions requiring information technology competencies. This experience increases students' skills, prepares them for initial employment, and increases occupational awareness and professionalism. Students work a minimum of six hours each week at an approved site and attend a weekly one-hour seminar.

**M 115 Probability and Linear Math, 3 cr.** *Offered every term.* Prereq., M 090 with a grade of B- or better, M 095, or ALEKS placement >3. Systems of linear equations and matrix algebra. Introduction to probability with emphasis on models and probabilistic reasoning. Examples of applications of the material in many fields. Graphing calculator required.

**MART 232 Interactive Web Publishing II , 3 cr.** *Offered autumn and spring.* Prereq., CAPP 120, CSCI 105, or consent of instr. Provides a background and foundation skills required for designing and implementing Web sites for public and private organizations. Marketing and design techniques are applied using state-of-the-art software.

**WRIT 101 College Writing I, 3 cr.** *Offered every term.* Prereq., WRIT 095 or passing score on placement test. Instruction and practice in expository writing, argumentation and research processes. Emphasis on the use of specific writing strategies to develop style, unity, clarity, and force of ideas, and structure. Students are expected to write without major errors in sentence structure or mechanics. Grading A-F, or NC.