

UAT-Online: Network Security (Bachelor of Science in Software Engineering)

Program Description

An Information Security specialist is an Information Technology professional who designs and manages security infrastructure. Students pursuing the Network Security major will learn the responsibilities associated with the design and implementation of proactive defenses and strategies by guarding against exploits and vulnerabilities in an expanding global environment. These duties will include proactive maintenance and security of the network hardware and operating systems by locking down those systems, being attentive to emerging vulnerabilities and hardening these systems as appropriate.

Students will study such business-critical components as analysis and rating of security risks and the requirements of the information, products, systems and services. Students will formulate a security focused design plan to implement and maintain the security infrastructure to protect and mitigate information from security breaches.

An Information Security specialist is highly technical role which will require intimate knowledge of systems in order to alleviate the vulnerabilities including programming.

Students in Network Security program will plan and develop effective, secure and efficient networks that protect information and information systems and infrastructures while developing non-technical skills such as teamwork, troubleshooting, documentation and interpersonal communication that are key to becoming a successful Information Security specialist.

The Network Security program reflects the application of theory and an alignment with industry standards and guidelines. It also provides students with the opportunity to synthesize and apply the vital skills and knowledge necessary to succeed in the workforce. Instruction will lead students into hands-on and real-world situations, where they will gain invaluable experience working with actual systems and networks.

This program will also prepare students to anticipate and integrate new and emerging technologies so that they can be successful within the rapidly evolving technology environment.

How UAT-Online Works

UAT-Online's Bachelor of Science in Software Engineering degree with a major in Network Security has been developed to give students the ability to focus 100% of their attention on each individual skill and class needed to become successful in this rapidly growing field. Classes are taken one at a time, and last five weeks each. Three classes will be taken each semester for a total of 15 weeks per semester. Courses are taken sequentially in order to build on the foundation of previous skills learned. This helps to increase overall understanding and comprehension of the material.

Objectives

- Install, configure and secure computer, network, security components, client and server operating systems following industry-standard guidelines
- Identify the various topologies, standards, technologies and protocols employed in secured systems
- Design, install, configure, maintain and secure network directory
- services and infrastructure, server services, routers and switches
- Plan, audit, document and troubleshoot information security systems using the OSI model
- Examine and demonstrate familiarity with federal guidelines, policies and procedures that govern information security
- Document and implement systems defense and countermeasures by utilizing disaster recovery planning and by hardening systems to ensure information security
- Examine and mitigate current industry threats, risks, malicious activities, covert methodology and unconventional tactics that may be deployed against a system, then evaluate, select, deploy and assess security measures to respond to and alleviate a security incident to prevent loss of sensitive information
- Implement and maintain security tools in the detection, notification, isolation and resolution of issues impacting information security
- Demonstrate familiarity with different scripting and/or programming languages as they relate to maintaining network security

University Core

INT200 Internship

LAW370 Legal Issues in Technology

MGT310 Project Management in a Technology Environment

PRO102 Professional Skills Development

PRO211 Thesis I: Innovation

PRO250 Thesis II: Prospectus

PRO480 Thesis IV: Thesis Defense

TCH110 Foresight Development

TCH301 Ethics in Technology

General Education

COM226 Public Speaking

ENG101 Composition I

ENG102 Composition II

ENG305 Mythology, Folktale and Fairy Tale

ENG310 Science Fiction as Literature

HIS331 The Vietnam Era

MAT175 College Algebra

MAT180 Pre-Calculus

MAT301 Discrete Math

PHY120 Introduction to Electricity and Magnetism

PHY230 Survey of Quantum Physics

PSY150 Psychology of Thinking

SOC150 Technology and Society

Major

CIS204 UNIX and LINUX I
NTS201 Security Essentials (WI)
NTS222 Hacking Essentials
NTS250 Network Defense Theory
NTS300 TCP/IP v.4
NTS330 Applied Exploits and Hacking
NTS350 Network Monitoring and Documentation (WI)
NTS355 Information Security and Organizational Management (WI)
NTS415 Network Defense and Countermeasures
NTS435 Federal INFOSEC Standards and Regulations (WI)
NTS445 Incident Response and Management
NTS450 Security Assessment Methodology (WI)
NTS470 Covert Channels (WI)
NTW100 Network and Telecommunication Essentials
NTW105 Computer Hardware Essentials
NTW215 Client and Server Administration
NTW230 Network Infrastructure and Services
NTW250 Scripting for Networks
NTW320 Directory Services Design and Administration
NTW330 Information System Management (WI)
NTW440 Business Continuity/Disaster Recovery (WI)

Additional semester for NSA-approved courseware:

UAT's Network Security courseware are certified by the US National Security Agency's (NSA) Information Assurance Courseware Evaluation program for 4011 CNSS National Standard for Information Systems Security (INFOSEC) Professionals and 4013 National Standard for System Administrators in Information Systems Security (INFOSEC). Students who wish to receive acknowledgement noting that they have completed curricula that adhere to national training standards must take these courses: NTS201, NTS300, NTS330, NTS350, NTS355, NTS415, NTS435, NTS445, NTS450, NTW100, NTW105, NTW330, NTW440.]

This list represents the combination of courses necessary for the degree. Course sequence and offerings may change due to software or other scheduling requirements. All courses designated (WI) are Writing Intensive courses.



University Core

INT200 Internship

An internship is considered a supervised, practical experience that is the application of previously learned theory. Employers/sponsors work with the student to meet specific objectives and/or learning goals and provide special mentoring or networking opportunities. In exchange, the intern helps the employer/ sponsor in meeting overall work goals for the agency/company. Students completing 3.0 credit internships must work a total of 150 hours, or 10 hours per week for 15 weeks.

LAW370 Legal Issues in Technology

This course addresses typical legal and business issues in the multimedia field. Rights granted under copyright, principles of fair use, trademarks, intellectual property law, trade secrets, unfair competition, disclosure and privacy laws are covered. Students explore these legal topics with focus on electronic media.

MGT310 Project Management in a Technology Environment

This course covers every aspect of managing a project in a technology environment, from how to assemble the right team, to figuring out a schedule, estimating needed resources and monitoring its progress. This course will cover determination, examination and critiques of current practices in project management with an emphasis on the use of technology to support project development. Also included are real-life project management problems such as the following: how to get results when you have no direct authority over participants, what to do when team members don't follow through, how to handle differing departmental agendas and how to balance your regular work with additional responsibilities. Finally, students will learn to communicate these issues effectively with electronic media.

PRO102 Professional Skills Development

This course is designed to develop life-long learning strategies. This course provides the basic skills for success in the educational, professional and personal environment. Specific topics explored are personality profile analysis, developmental styles, conflict resolution skills, group problem solving and learning style analysis. Collaboration and group skills development will be emphasized. Students will have the opportunity to receive extra assistance in computer and word processing skills.

PRO211 Thesis I: Innovation

The purpose of this course is to develop students as technologists who can explore and critically analyze a potential and emerging topic for their thesis and shape their ideas into a form that represents a clear set of thinking to be used as the basis for developing their innovation. In creating a topic document based upon their investigations, students will demonstrate their ability to communicate their technology ideas to others and increase the likelihood that their idea will take form and find a relevant application in society. The course will culminate with the composition and approval of the student's topic paper. The topic paper will include an abbreviated introduction of the innovation, short prior art identification and general methodology.

PRO250 Thesis II: Prospectus

This course presents the student with the basic concepts and methods through which to perform, identify and evaluate prior art associated with technology innovations. Emphasis is placed on the development of the thesis prospectus, encompassing the statement of need (Chapter 1), the literature review or review of prior art (Chapter 2), and the methodology (Chapter 3). The course will culminate in the composition and approval of Chapters 1-3 of the undergraduate thesis.

PRO480 Thesis IV: Thesis Defense

This course completes undergraduate thesis and portfolio process providing guidance and structure for the formal presentation of the student's work. Students will passionately and clearly articulate their innovation, technology concepts and application in a formal defense. Students entering this class are expected to have completed all works included in their portfolio and have their thesis chapters approved through the completion of prior thesis course work prior to enrolling.

TCH110 Foresight Development

You learn better global, business and personal foresight, so you can better enjoy and manage your own future. This course will explore the big picture history of accelerating change from universal, historical and technological perspectives, as well as identifying global trends that are affecting individuals, society, businesses and governments. Additionally, the course will examine how organizations make bets on the future, and gives the student a chance to explore career prospects in a variety of fields. Finally, discussion of how biology, psychology, community and culture help and hinder personal thinking about the future will be discussed. We will articulate and explain the four fundamental foresight processes: innovating the future (creative development of products and services); planning the future (developing shared goals and processes); profiting in the future (achieving measurable positive results, including environmental, social, and economic benefits); and predicting the future (trend identification and analysis). Assignments will be fun, personalized to your own foresight goals, and will include brief readings, brief writing, discussions, debates, visuals, film, podcasts and games.

TCH301 Ethics in Technology

TCH301 is designed to introduce students to essential concepts necessary to evaluate the ethical implications and potential impacts of the use of new technology within human society and culture. Students will explore modern ethical dilemmas in technology, looking at multiple aspects of how the introduction of technology redefines law and values.

General Education**COM226 Public Speaking**

This course offers instruction and practice in organization that is delivery-based on purpose and audience. Topics include formulating effective presentations to introduce, demonstrate, inform and persuade. Information on utilizing visuals effectively will also be included.

ENG101 Composition I

This course is designed to present effective techniques in organizing, developing and writing academic essays that reflect a collegiate-level of writing. The purpose of this course is to help students write correctly, clearly and thoughtfully.

ENG102 Composition II

This course expands and refines the objectives of English Composition I. It empathizes critical/logical thinking and reading, problem definition, research strategies and writing analytical, evaluative and/or persuasive papers that incorporate research. In this section, each student will devote her/himself to a research topic that we'll approach in a variety of ways over the course of the semester. The result will be a final project that centers on a topic that the student has a deep interest in.

ENG305 Mythology, Folktale and Fairy Tale

Escape to the fantastic realms of mythology, folktales and fairy tales as we read stories from around the world and through the ages. You might be surprised at how pervasive the archetypes and themes from these genres are in our modern world, from movies to popular animation and games. The course allows students to explore the cultural similarities and differences in myths, folktales and fairy tales through selected readings, discussions and writings.

ENG310 Science Fiction as Literature

A long time ago in a galaxy not so far away, science fiction evolved from a variant pulp magazine topic to a literary genre in its own right. You will travel back to witness the birth of this genre, learning about the works and authors who influenced it and gave it legitimacy over the past eighty years or more. Be prepared to immerse yourself in novels and short stories from some of the greatest names in science fiction, and be prepared to write intelligently about what you have read.

HIS331 The Vietnam Era

This course is designed to present a comprehensive overview of the period in which the United States was engaged in conflict in Vietnam. Some aspects of the conflict that will be studied are how the United States became involved in the situation, the involvement of each US president and his war policies, the ground war, the experience of the prisoners-of-war and the after-effects that resulted from this involvement.

MAT175 College Algebra

This course will include a thorough treatment of relations and functions, polynomial functions, exponential and logarithmic functions, systems of equations and inequalities, matrices, conic sections, sequences, induction and probability.

MAT180 Pre-Calculus

MAT180 is a preparatory course for calculus. Students will further develop an understanding of functions, their graphs and real-world applications of functions. Students will also gain a solid foundation of trigonometric functions and their properties and applications

MAT301 Discrete Math

MAT301 is an introduction to discrete mathematics. Topics covered will include logic, methods of proof, elementary number theory, set theory and principles of counting.

PHY120 Introduction to Electricity and Magnetism

This course will introduce the student to basic concepts of electricity and magnetism with discussion of practical applications. Charges and fields will be used to understand the concepts of potential, resistance, capacitance and inductance and solve basic DC circuits. Math through college algebra required.

PHY230 Survey of Quantum Physics

This course will survey the origins and theories of quantum physics from a primarily non-mathematical standpoint. Practical effects of quantum theory in microelectronics will also be discussed. Topics include the state of classical physics at the turn of the 20th century, the photoelectric effect, wave-particle duality, the Bohr atom, subatomic particle spin and the periodic table, Heisenberg's uncertainty principle, Einstein's debates with Bohr over quantum theory, and the debate on how to interpret the theory's physical significance.

PSY150 Psychology of Thinking

PSY150 will examine the writings of Pythagoras, the father of formal mathematical thinking; Aristotle's major works, including his 100-plus tests for the truth of any proposition; and other major thinkers from the classical period to modern times, including Francis Bacon, Galileo and other progenitors of the natural and behavioral sciences. The course will close with a survey of living thinkers, including "systems thinkers" and a study of the major books by Edward de Bono.

SOC150 Technology and Society

SOC150 is designed to introduce students to the essential understanding, development, theories, strategies and historical interrelation of technology and society. The purpose of the course is to provide students with the tools necessary to understand the role technology has played in society and to prepare students for interaction in a technology driven world with a comprehensive look at the relationship between technology and culture. Technology will be recognized as a driving force in cultural revolutions and as a foundational concept of human development. The course will consider rapidly changing technologies in modern society, the problems associated with these changes, and the affects of these technologies on the societies and cultures around the world.

Major**CIS204 UNIX and LINUX I**

This course provides an overview of the commands, utilities and supporting architecture used in the UNIX operating system. This course provides the student with skills needed to navigate the UNIX aspects of the Internet and perform file/ system operations on graphics workstations. Topics include common utilities, making files, the VI and EMAC editors, and C, Bourne and Korn shells.

NTS201 Security Essentials (WI)

The goal of this course is to provide network administrators with the knowledge they need to design and implement an effective security strategy in a corporate network environment. This course will cover anti-virus tools, security policies, password management, risk analysis, security policies, network communication vulnerabilities, enhancing security with cabling and network hardware, understanding different types of firewalls, packet filtering and NAT, setting up and securing a virtual private network and understanding hacker exploits. The documentation created during this course can be added to the student's portfolio.

NTS222 Hacking Essentials

When talking about network security, we have to acknowledge that all systems have vulnerable points. This course examines the fundamental and historical perspective of hacking methodology and psyche. The hacking topics are explored in order to examine the current systems associated with these vulnerable points. This course examines the techniques and tools to detect and evaluate these vulnerable points of known exploits in network and operating systems. Types of hackers include those that snoop around networks, vandalize websites or even steal proprietary information by the use of well-known schemes, such as viruses, worms, Trojan horses, denial-of service attacks and buffer overflows.

NTS250 Network Defense Theory

This course examines the art of defense for network protection. Topics include designing a network defense, security policies, choosing and designing various hardware, and software defense solutions. Additionally, this course will provide solutions for identifying and assessing external and internal threats to your network in a multi-vendor environment.

NTS300 TCP/IP v.4

Transmission Control Protocol/Internet Protocol is the suite of communications protocols used to connect the Internet and network systems. In this course, students will travel in-depth into the TCP/IP protocol suite to learn concepts such as link layers, subnetting, Internet Protocol (IP), address resolution protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol, IP routing and Domain Name System.

NTS330 Applied Exploits and Hacking

This course develops techniques to detect and evaluate vulnerable points using a strategy similar to the Shaolin monks in ancient China. We learn that we must learn to destroy in order to learn how to protect. This is an applied hands-on course requiring the use of a variety of operating systems, including walking through a standard hacking methodology that includes discovery, information gathering, targeting, attacks, penetration, escalation of privileges and maintaining access. Feedback is provided on appropriate means for countering each step of this common methodology.

NTS350 Network Monitoring and Documentation (WI)

The managerial and technical aspects of information security are addressed by focusing on the need for security. The professional issues in information security relating to the security, legal, ethical, risk management and best practices are assessed. The security implications regarding the relevance of employee

training and awareness practices are examined. The information security comprising a logical and physical design and maintenance are incorporated in the implementation plan. The documentation created during this course can be added to the student's portfolio.

NTS355 Information Security and Organizational Management (WI)

Information security is a rapidly changing discipline in a vast information society. Corporations need to protect their information resources from theft. Developing comprehensive risk assessment plans will prevent the loss of sensitive data. This course will address both the managerial and technical aspects of information security. Topics include the need for security in the enterprise; legal, ethical and professional issues in information security; risk management; best practices for security; logical and physical design of security; implementing security; employee training and awareness; and security maintenance. The documentation created during this course can be added to the student's portfolio.

NTS415 Network Defense and Countermeasures

The Network Defense and Countermeasures course is the art of fencing for network protection. This course covers designing a network defense; security policies; choosing and designing firewalls; configuring firewalls (demos and research); setting up VPNs; Intrusion Detection System overview and design; honey pots; and behavior-blocking software. Additionally, this course will provide solutions for identifying, assessing and preventing external and internal threats to your network in a multi-vendor environment.

NTS435 Federal INFOSEC Standards and Regulations (WI)

This course is an overview of the world of federal and international information security standards that guide the way organizations are doing business today. Research and analysis are conducted on how US security regulations vary from industry to industry, including healthcare, education, military, federal organizations, utilities and financial organizations. International security standards will also be reviewed in order to understand the impact of implementing appropriate information security mechanisms in a global organization. The documentation created during this course can be added to the student's portfolio.

NTS445 Incident Response and Management

This course addresses how to react to adverse conditions in a networked world. The procedures for proactive and planning techniques that help ensure that appropriate reaction occurs during a system breach are conveyed. The course includes common detection techniques utilized in the business world, along with detailed information on best practices for reacting and responding to a system or network compromise. The documentation created during this course can be added to the student's portfolio.

NTS450 Security Assessment Methodology (WI)

This course is based on the National Security Agency's (NSA) Information Security (INFOSEC) Assessment Methodology (IAM). This course is an overview of the NSA's recommended methods for conducting an organizational security assessment, including

coordination with the customer; defining critical information within the organization; and compiling findings based on regulations, legislation and policies for which the organization is liable to comply. The students that attend this course will be required to attend the course and then participate in an actual IAM-based assessment. The documentation created during this course can be added to the student's portfolio.

NTS470 Covert Channels (WI)

This course delves into the technical realm of covert channels and how to communicate outside the design of many systems. The applied tools and applications of the trade are utilized to create various types of hidden communication in order to better understand how those mechanisms operate. The tools include stenography, network-based channels, text-based channels and operating system channels. Detection techniques and concepts for potential new areas of research for a variety of covert channels are presented. The documentation created during this course can be added to the student's portfolio.

NTW100 Network and Telecommunication Essentials

A firm grasp of basic networking concepts is a key to success in this field. This course is the foundation of knowledge for a networking infrastructure that will enable you to engage and understand future networking courses. This course provides an overview of fundamental networking concepts to connect your established knowledge.

NTW105 Computer Hardware Essentials

Where is the "1" pin? This course introduces the fundamentals of personal computer hardware. It is a hands-on course focused on the computer hardware elements in which students will construct a computer in teams. Topics and types of hardware introduced in this course include the following: processors, motherboards, interrupts, DMA, bus size, cycle time, memory refresh rates, the difference between IDE and SCSI, RAM, ROM, Flash Memory, CMOS, Parallel and Serial ports, other ports and an assortment of controller cards. The applied topics of computer component safety, proper handling techniques, PC assembly, OS installation and basic hardware troubleshooting are employed.

NTW215 Client and Server Administration

This course provides the knowledge and skills necessary to install and configure a client and server operating systems in a stand-alone and networked environment. This course is a mixture of theoretical and applied knowledge to develop the administration skills necessary to the successful completion and understanding of many of the networking and security courses.

NTW230 Network Infrastructure and Services

This course provides the necessary skills to install, configure and manage network services in a Microsoft Windows network. A mixture of theoretical and applied knowledge to implement diverse networking services and network protocols are utilized. Some examples of networking services are DHCP server, DNS server, WINS, RRAS, IP Routing, IP Security, NAT, VPNs and Certificate Services.

NTW250 Scripting for Networks

A how-to script course designed to create customized operating systems, automate commands and simplify administration tasks using scripts. The techniques and instructions include shells as a user interface, basic scripting, script editing and debugging, graphing data, and simplifying administrative tasks utilizing current platforms and examples. The documentation created during this course can be added to the student's portfolio.

NTW320 Directory Services Design and Administration

This course provides the knowledge and skills necessary to plan, design and implement a directory services infrastructure in an enterprise network. Strategies are presented to identify the information technology needs of an organization, and then design a directory services structure that meets those needs. The documentation created during this course can be added to the student's portfolio.

NTW330 Information System Management (WI)

This course is a complete introduction to the fundamental concepts of information systems and the ways they are applied in today's business world. The latest business trends are analyzed, from enterprise systems and make-or-buy decisions to global e-commerce and data mining, all in order to bring readers up-to-date with the state of business today. The documentation created during this course can be added to the student's portfolio.

NTW440 Business Continuity/Disaster Recovery (WI)

This course will provide a comprehensive overview of disaster recovery and countermeasures for networks and businesses. Assess risks in the enterprise, develop an enterprise disaster recovery system, develop disaster policies, procedures, departmental roles and communication processes for enterprise network. Produce a disaster recovery document of procedures and policies to implement training, testing and rehearsal of a disaster recovery. The documentation created during this course will be added to the student's portfolio.