

SEC 110 SECURITY CONCEPTS

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course introduces the concepts and issues related to securing information systems and the development of policies to implement information security controls. Topics include the historical view of networking and security, security issues, trends, security resources, and the role of policy, people, and processes in information security. Upon completion, students should be able to identify information security risks, create an information security policy, and identify processes to implement and enforce policy. Hours Per Week: Class, 3. Lab, 0. Semester Hours Credit, 3.

LEARNING OUTCOMES:

Upon completion of this course, students will be able to:

- a. Identify basic security concepts, including terminology and models
- b. Identify elements of cryptography, including encryption and hashing algorithms
- c. Compare symmetric and asymmetric encryption
- d. Describe and manage the basics of Public Key Infrastructure and certificates
- e. Describe access control models and implementations
- f. Identify authentication types and their appropriate use
- g. Identify categories and examples of network and computer attacks and malware
- h. Harden systems to increase security
- i. Identify vulnerabilities and increase security of wireless networks
- j. Identify network security devices
- k. Identify access control and account management security measures
- l. Perform basic vulnerability assessment to identify and manage risk and threats
- m. Describe and develop business continuity and disaster recovery plans
- n. Identify components of a sound security policy
- o. Participate in developing and implementing security procedures and guidelines

OUTLINE OF INSTRUCTION:

- I. Introduction to Computer Security
 - a. Historical review of the security problem
 - b. Types and avenues of attack
 - c. Types of defenses
- II. Systems Threats and Risks
 - a. Software attacks
 - b. Hardware attacks

- III. Protecting Systems
 - a. Hardening the operating system
 - b. Hardening the web browser
 - c. Hardening web and network services
 - d. Controlling network access
- IV. Network Vulnerabilities and Attacks
 - a. Media and network device vulnerabilities
 - b. Categories of attack
 - c. Methods of attack
- V. Network defenses
 - a. Secure network design
 - b. Secure network technologies
 - c. Network security devices
 - d. Intrusion detection and prevention
 - e. Protocol analyzers
- VI. Wireless Network Security
 - a. Weaknesses and hardening of wireless networks
 - b. Wireless encryption systems
- VII. Access Control
 - a. Logical versus physical
 - b. Mandatory, discretionary, and role-based access control
- VIII. Authentication, Authorization, and Accounting
 - a. Authentication and access control terminology
 - b. Credentials and identity
 - c. Privilege management
- IX. Vulnerability Assessments
 - a. Threat and risk assessment
 - b. Risk management models and tools
 - c. Identifying vulnerabilities
- X. Security Audits
 - a. Privilege auditing, management, and assignment
 - b. Usage auditing
 - c. Auditing tools
- XI. Cryptography
 - a. Encryption algorithms
 - b. Hashing algorithms
 - c. Symmetric encryption
 - d. Asymmetric encryption

- e. Network, drive, and file encryption
- f. Public Key Infrastructure basics and digital certificates
- g. Certificate and registration authorities

XII. Disaster Recovery and Business Continuity

- a. Disaster Recovery planning and execution
- b. Disaster recovery policies and procedures

XIII. Security Policies and User Training

- a. Organizational security policies
- b. Types of Security policies
- c. User education
- d. Social engineering

REQUIRED TEXTBOOK AND MATERIALS:

Text to be assigned by the instructor each semester

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 919-536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1209.