NATIONAL SECURITY AGENCY, CERTIFICATE

Requirements for an undergraduate certificate may be completed at any campus location offering the specified courses for the certificate.

Certificate Learning Objectives

- **Communication (Individual and Team):** Communicate and work effectively (both individually and in teams) with a range of perspectives and audiences through a variety of media.
  - Students will be able to develop system specific plans for:
    - The protection of intellectual property; - The implementation of access controls; and
    - Patch and change management.
  - Students will be able to develop contingency plans for various size organizations to include: business continuity, disaster recovery and incident response.
- **Knowledge/Application:** Explain and apply the interdisciplinary knowledge of information sciences in a security context to recognize, analyze, defend against, and manage cyber risks.
  - Given a specific scenario, students will be able to identify the needed design principle.
  - Students will be able to describe how crypto can be used, strengths and weaknesses, modes, and issues that have to be addressed in an implementation (e.g., key management), etc.
  - Students will be able to describe the differences between symmetric and asymmetric algorithms.
  - Students will be able to describe which cryptographic protocols, tools and techniques are appropriate for a given situation.
  - Students will be able to examine the architecture of a typical, complex system and identify significant - vulnerabilities, -risks,- and points at which specific security technologies/methods should be employed.
  - Students will be able to identify the elements of a cryptographic system.
  - Students will be able to apply security principles to the design and development of database systems and database structures.
  - Students will be able to identify and describe common security concerns in database management systems.
  - Describe a basic network architecture given a specific need and set of hosts/clients.
  - Students will be able to apply their knowledge of network technologies to design and construct a working network.
  - Students will be able to demonstrate the use of a network monitor to display packets.
  - Students will be able to analyze a trace of packets to identify the establishment of a TCP connection.
  - Students will be able to track and identify the packets involved in a simple TCP connection (or a trace of such a connection).
  - Students will be able to describe the fundamental concepts, technologies, components and issues related to communications and data networks.
  - Students will be able to describe the hardware components of modern computing environments and their individual functions.
  - Students will be able to describe the fundamental concepts, technologies, components and issues related to communications and data networks.
  - Students will be able to use a network mapping tool (e.g., Nmap).
  - Students will be able to apply their knowledge to implement network defense measures.
  - Demonstrate their proficiency in the use of scripting languages to write simple scripts (e.g., to automate system administration tasks).
  - Students will be able to use a network monitoring tools (e.g., WireShark).
  - Students will be able to describe the various concepts in network defense.
  - Students will be able to apply cyber defense methods to prepare a system to repel attacks.
  - Students will be able to describe appropriate measures to be taken should a system compromise occur.
  - Students will be able to describe common security models of database management systems.
  - Students will be able to compare the advantages and disadvantages of various risk assessment methodologies.
  - Students will be able to describe how risk relates to a system security policy.
  - Describe various risk analysis methodologies.
  - Students will be able to select the optimal methodology based on needs, advantages and disadvantages.
- **Problem-Solving:** Understand, apply and adapt various problem solving strategies, using appropriate technology and methods.
  - Students will be able to demonstrate proficiency in the use of a programming language to solve complex problems in a secure and robust manner.
  - Students will be able to demonstrate the ability to design and develop basic programs for modern computing platforms (e.g., PC, cloud, mobile, web).
  - Students will be able to write simple linear and looping scripts.
  - Students will be able to write simple and compound conditions within a programming language or similar environment (e.g., scripts, macros, SQL).
  - Students will be able to describe how basic statistics and statistical methods can be applied in a given situation.
  - Students will be able to evaluate probabilities to solve applied problems. (STAT 200, SRA 365)
  - Students will be able to apply standard statistical inference procedures to draw conclusions from data.
  - Students shall be able to use one or more common DF tools, such as EnCase, FTK, ProDiscover, Xways, SleuthKit.
  - Students will be able to identify the bad actors in cyberspace and compare and contrast their resources, capabilities/techniques, motivations, aversion to risk.
  - Students will be able to examine the placement of security functions in a system and describe the strengths and weaknesses.
- **Professional Responsibilities:** Describe professional responsibilities in terms of the ethical, legal and security policy aspects of information assurance and security.
  - Students shall be able to discuss the rules, laws, policies, and procedures that affect digital forensics.

- Students will be able to describe the steps in performing digital forensics from the initial recognition of an incident through the steps of evidence gathering, preservation and analysis, through the completion of legal proceedings.
- Students will be able to describe how the type of legal dispute (civil, criminal, private) affects the evidence used to resolve it.
- Students will be able to list the applicable laws and policies related to cyber defense and describe the major components of each pertaining to the storage and transmission of data.
- Students will be able to describe how standards, such as the Orange Book, may be applied to the requirements for a sub-contractor or customer.