



## **COURSE OBJECTIVES: GRADUATE CERTIFICATE IN CYBER SECURITY AND DEFENSE**

### **Cybersecurity Programming and Analysis**

This course covers programming concepts related to the security of operating systems, applications, networks, and mobile devices. This course will explore:

- Principles of network, database and operating system cybersecurity
- Use of multiple cybersecurity-related programming languages
- Building and extending existing scanning software
- Analysis and reporting of XML or JSON based cyber related data stores
- Analysis and reporting of cyber related NIST data stores
- Log analysis through programming and scripting
- Database programming and attack mitigation
- Analysis of intrusion prevention data
- Use of existing tool vs new tool creation analysis

### **Cyber Infrastructure and Defense**

This course covers analysis and defense techniques for operational networks and critical infrastructure. This course will explore:

- Design and use of cryptographic systems
- Network security firewalls and devices
- Intrusion detection systems
- Malware detection
- Distributed Denial of Service
- Infrastructure and Application attacks
- Emerging cybersecurity defense methods

### **Operating Systems**

Students study the principles of computer operating systems and their essential components. Team projects expose students to a variety of system design issues as they relate to the functionality and performance of the system.

### **Computer Networks**

An in-depth study of active research topics in computer networks.

### **Cloud Computing**

This course studies fundamental designs and key technologies in Cloud Computing by reading technical articles, and conducting a semester group project.