

# Cybersecurity (CYB)

---

## **CYB 134. Introduction to Cybersecurity. (3)**

This course focuses on the Societal Security knowledge area of cybersecurity. Cybercrime, law, ethics, policy, privacy and their relation to each other are the key concepts of this knowledge area. The threat of cybercrime across the global society is incredibly serious and growing. Laws, ethics and policies are vital to the security of corporate and government secrets and assets, as well as to the protection of individual privacy and identity.

## **CYB 177. Independent Studies. (0-6)**

## **CYB 234. System Administration and Scripting for Cybersecurity. (3)**

Introduction to Linux and Windows system administration tasks focusing on system administration skills, administering user capabilities, the file system, access controls, and other system services (e.g., firewall and networking). Students are introduced to Windows-specific tasks such as Active Directory and Group Policies and to scripting for system administration tasks using bash, Python and PowerShell. Prerequisite: CSE 174 and CYB 134.

## **CYB 235. Computer Network Design and Administration. (3)**

This course introduces students to the fundamentals of computer networking, the OSI stack, and the practical and conceptual skills needed to build simple local area networks, perform basic device configurations, and implement subnet schemes and their IP addressing. Students will also configure and troubleshoot simulated networks consisting of end devices, switches and routers. Prerequisite: CYB 234 or CSE 278. Cross-listed with CSE 235.

## **CYB 236. Data Security. (3)**

Data security is the study of techniques for protecting data (against cyberattacks, data breaches, etc.) at rest, during processing, and in transit. Data security is connected to almost all aspects of cybersecurity. This course presents the techniques and tools used in data security. Prerequisite: MTH 231.

## **CYB 277. Independent Studies. (0-6)**

## **CYB 331. Software Security. (3)**

This course focuses on the development and use of software that reliably preserves the security properties of the information and systems. The topics emphasized in this course include secure software design, implementation, testing, deployment, documentation, and maintenance. The ethics surrounding cybersecurity are also discussed from a software development and maintenance perspective. Prerequisites: CYB 134, CSE 201.

## **CYB 332. Human, Organizational, and Societal Security. (3)**

This course discusses human, organizational, and societal aspects of cybersecurity. The human part focuses on protecting individuals' data and privacy in the context of organizations (i.e., as employees) and personal life, as well as the study of human behavior as it relates to cybersecurity. The organizational part focuses on protecting organizations from cybersecurity threats and managing risk to support the successful accomplishment of the organization's mission. Finally, the societal part discusses aspects of cybersecurity that broadly impact society as a whole with a focus on various aspects of privacy. Pre-requisite: CYB 236.

## **CYB 334. Network Security. (3)**

The course addresses topics related to network security. It starts with studying general network vulnerabilities and progresses to using techniques to protect networks. The use of cryptography is addressed in many of the different tools and techniques for protecting networks. The course relies heavily on lab exercises to both understand and deploy countermeasures that protect systems against network attacks.

Prerequisites: CYB 235, CYB 236, CSE 278.

## **CYB 335. Defensive Security. (3)**

This course introduces students to the role and techniques of cyberdefense including attack identification, analysis, mitigation, and response. This course uses hands-on labs to build important applied skills for cyberdefense.

Prerequisite: CYB 334.

## **CYB 340. Internship. (0-20)**

## **CYB 377. Independent Studies. (0-6)**

## **CYB 435. Offensive Security. (3)**

This course introduces students to the techniques of offensive security through hands-on exercises using tools for evaluating system and network security. This course covers the techniques and principles of exploitation of computer and network vulnerabilities, monitoring tools, and identifying potential defensive measures. Prerequisite: CYB 334.

## **CYB 437. Cybersecurity Senior Design Project/Capstone. (3)**

This course is a Miami Capstone Experience in the area of cybersecurity. In this course the student will conduct a semester-long project that provides hands-on practice and assessment of their cybersecurity skills. Students will work in teams or groups to address current and relevant cybersecurity projects. SC. Prerequisites: CYB 331, CYB 332, CYB 335, CYB 435.

## **CYB 477. Independent Studies. (0-6)**