

CYBERSECURITY (CYB)

CYB 3840 Introduction to Cybersecurity 3 Credits

An introduction to the principles of computer security. Topics include computer and system security, authentication, access control, malicious software, and software security. The course also examines how system designs, network protocols, and software engineering practices can result in vulnerabilities. The course explores how to design and implement systems to mitigate vulnerabilities. In addition, the course explores how to detect and mitigate vulnerabilities in existing systems.

Components: Class

Prereqs/Coreqs: P. C- or better in COMPUTER 3830

CYB 3850 Cryptography 3 Credits

An introduction to the fundamentals of applied cryptography. Topics include encryption and decryption, symmetric and asymmetric algorithms, pseudorandom functions, block ciphers, hash functions, digital signatures, key exchange, message authentication, and public-key certification. This course also covers common attacks and suggested countermeasures with appropriate cryptographic protocols and techniques. Hands-on labs will provide students with real-world experiences.

Components: Laboratory, Discussion, Class

Prereqs/Coreqs: P. C- or better in CYB 3840

CYB 3910 Introduction to Network Security 3 Credits

An introduction to network security principles and applications. Topics include security protocols and services, authentication applications, network management security, web security, wireless network security, mobile security, and system security. This course will examine different network architectures, threats and attack surfaces exploited by these threats.

Components: Discussion, Class, Laboratory

Prereqs/Coreqs: P. CYB 3840

CYB 3930 IT Security Management 3 Credits

An introduction to the formal process used to develop and maintain appropriate security levels for an organization with a focus on risk management. The process of risk management ensures that an organization protects itself from unexpected financial and reputation losses and discerns appropriate controls. Topics include security program, planning, strategies, controls, auditing, risk assessment and analysis models, risk measurement, business continuity and incident management, security awareness, and legal and ethical issues.

Components: Discussion, Laboratory, Class

Prereqs/Coreqs: P. CYB 3840

CYB 3960 Software Security 3 Credits

This course introduces the fundamental security principles in software development lifecycle to minimize the vulnerabilities and threats in software development. Students will be exposed to the security techniques in designing, developing, and testing software. Hands-on labs allow students to experiment with threads/attacks and defenses in software development.

Components: Discussion, Laboratory, Class

Prereqs/Coreqs: P. C- or better in both CYB 3840 and COMPUTER 3230

CYB 4110 Cybersecurity Seminar 1 Credit

The course consists of lectures/discussions presented by both cybersecurity faculty and students enrolled in the class.

Components: Discussion, Class

Prereqs/Coreqs: P. Junior/senior standing

CYB 4330 Cybersecurity Project I 3 Credits

This course builds on the concepts of computer science and cybersecurity with an emphasis on applying skills and knowledge learned in previous courses to a large, team-based, capstone project that spans two semesters. The capstone project integrates problem-solving techniques and the development of viable solutions to meet an identified technology or design need in a business or institutional environment.

Components: Practicum

Prereqs/Coreqs: P. C- or better in CYB 3930 and senior standing

CYB 4730 Cybersecurity Project II 3 Credits

This course is a continuation of CYB 4330 Capstone Project I, where the project will be continued and carried to completion. The capstone project integrates problem-solving techniques and the development of viable solutions to meet an identified technology or design need in a business or institutional environment. The course will also introduce current research issues in cybersecurity/computer science.

Components: Laboratory, Field Studies, Class

Prereqs/Coreqs: P. C- or better in CYB 4330