**CYSE - Cybersecurity**

**CYBERSECURITY Courses**

**CYSE 100. Cyber Explorers and University Orientation. 1 Credit.** This course provides an introduction to cyber hygiene and orientation to university life.

**CYSE 200T. Cybersecurity, Technology, and Society. 3 Credits.** Students will explore how technology is related to cybersecurity from an interdisciplinary orientation. Attention is given to the way that technologically-driven cybersecurity issues are connected to cultural, political, legal, ethical, and business domains.

**CYSE 250. Basic Cybersecurity Programming and Networking. 3 Credits.** This course introduces the cybersecurity-centric programming and networking concepts. Students will develop problem solving skills by using low-level programming languages (including C and assembly) and learn fundamentals of network protocols. This course is the technical base for students to take cybersecurity major courses. No prior knowledge of programming and networking is assumed. Prerequisite: MATH 162M or higher.

**CYSE 300. Introduction to Cybersecurity. 3 Credits.** This course provides an overview of the field of cybersecurity. It covers core cybersecurity topics including computer system architectures, critical infrastructures, cyber threats and vulnerabilities, cryptography, information assurance, network security, and risk assessment and management. Students are expected to become familiar with fundamental security concepts, technologies and practices, and develop a foundation for further study in cybersecurity. Prerequisite: MATH 162M or permission of the instructor.

**CYSE 301. Cybersecurity Techniques and Operations. 3 Credits.** This course introduces tools and techniques used to secure and analyze large computer networks and systems. Students will explore and map networks using a variety of diagnostic software tools, learn advanced packet analysis, configure firewalls, write intrusion detection rules, perform forensic investigation, and practice techniques for penetration testing. Prerequisite: MATH 162M or permission of the instructor.

**CYSE 368. Cybersecurity Internship. 1-6 Credits.** This course allows students to volunteer to work in an agency related to cybersecurity. Students must volunteer for 50 hours per course credit and complete course assignments. Prerequisite: approval by the Director of the Center for Cybersecurity Education and Research.

**CYSE 395. Topics in Cybersecurity. 1-3 Credits.** Study of selected topics in cybersecurity. Prerequisites: junior standing.

**CYSE 406. Cyber Law. 3 Credits.** This course tackles two major cyber law subjects. The first part of the course examines various U.S. laws and legal considerations that impact the digital and cyberspace worlds from traditional civil, and to a lesser extent, traditional criminal perspectives. The second part will familiarize cyber operations professionals about the extent of and limitations on the digital and cyberspace worlds from traditional civil, and to a lesser extent, traditional criminal perspectives. The second part will familiarize cyber operations professionals about the extent of and limitations on U.S. law, regulations, directives and policies. The course will also introduce students to miscellaneous cybersecurity topics such as the Federal Acquisition Requirements. Prerequisite: junior standing.

**CYSE 407. Digital Forensics. 3 Credits.** This course introduces the basic concepts and technologies of digital forensics. Students will learn the fundamental techniques and tools utilized for collecting, processing, and preserving digital evidence on computers, mobile devices, networks, and cloud computing environments. Students will also engage in oral and written communication to report digital forensic findings and prepare court presentation materials. Prerequisites: declared major and junior standing.

**CYSE 494. Entrepreneurship in Cybersecurity. 3 Credits.** This course is designed to help students enhance their personal and professional development through innovation guided by faculty members and professionals. It offers students an opportunity to integrate disciplinary theory and knowledge through developing a nonprofit program, product, business, or other initiative. The real-world experiences that entrepreneurship provide will help students understand how academic knowledge leads to transformations, innovations, and solutions to different types of problems. The course can be delivered either as an independent project for individual students or as group projects similar to those sometimes offered in topics courses. Prerequisite: Approval by the Director of the Center for Cybersecurity Education and Research.

**CYSE 495/595. Topics in Cybersecurity. 1-3 Credits.** The advanced study of selected cybersecurity topics designed to permit small groups of qualified students to work on subjects of mutual interest. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisite: permission of the instructor.

**CYSE 496/596. Topics in Cybersecurity. 1-3 Credits.** The advanced study of selected cybersecurity topics designed to permit small groups of qualified students to work on subjects of mutual interest. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisite: permission of the instructor.

**CYSE 497/597. Tutorial Work in Special Topics in Cybersecurity. 1-3 Credits.** Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: senior standing and approval of the Director of the Center for Cybersecurity Education and Research.

**CYSE 498/598. Tutorial Work in Special Topics in Cybersecurity. 1-3 Credits.** Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: senior standing and approval of the Director of the Center for Cybersecurity Education and Research.

**CYSE 595. Topics in Cybersecurity. 1-3 Credits.** The advanced study of selected cybersecurity topics designed to permit small groups of qualified students to work on subjects of mutual interest. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisite: permission of the instructor.

**CYSE 596. Topics in Cybersecurity. 1-3 Credits.** The advanced study of selected cybersecurity topics designed to permit small groups of qualified students to work on subjects of mutual interest. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisite: permission of the instructor.

**CYSE 597. Tutorial Work in Special Topics in Cybersecurity. 1-3 Credits.** Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisite: approval of the Director of the Center for Cybersecurity Education and Research.

**CYSE 598. Tutorial Work in Special Topics in Cybersecurity. 1-3 Credits.** Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisite: approval of the Director of the Center for Cybersecurity Education and Research.
CYSE 600. Cybersecurity Principles. 3 Credits.
This course provides an overview of the field of cybersecurity. It covers core cybersecurity topics including computer system architectures, critical infrastructures, cyber threats and vulnerabilities, cryptography, cryptographic protocol design, information assurance, network security, and risk assessment and management. Students are expected to become familiar with fundamental security concepts, technologies and practices, and develop a foundation for further study in cybersecurity.

CYSE 601. Advanced Cybersecurity Techniques and Operations. 3 Credits.
This course introduces tools and techniques used to secure and analyze large computer networks and systems. It will include significant hands-on lab work. Students will explore and map networks using a variety of diagnostic software tools, learn advanced packet analysis, configure firewalls, write intrusion detection rules, perform malware detection, forensic investigation, and practice techniques for penetration testing.

CYSE 603. Advanced Cybersecurity Law and Policy. 3 Credits.
This course addresses two major cyber law subject matters. The first part of the course examines various U.S. laws and legal considerations that impact the digital and cyberspace worlds from civil and criminal perspectives. The second part, which builds upon the first, will familiarize cyber operations professionals about the extent of and limitations on their authorities to ensure operations in cyberspace are in compliance with U.S. law, regulations, directives and policies.

CYSE 605. Leadership and Management in Cybersecurity. 3 Credits.
This course introduces skills to manage technical professionals and lead strategic change in their organization. Based on the basic operations and functionality of cybersecurity systems, students will learn the management of cybersecurity technical professionals, including how to effectively lead and manage teams, how to launch and assess organizational change initiatives, and how to work effectively within an interdependent group to achieve common goals.

CYSE 607. Advanced Digital Forensics. 3 Credits.
This course introduces the concepts and technologies of digital forensics. Students will learn the advanced techniques and tools utilized for collecting, processing, and preserving digital evidence on computers, mobile devices, networks, and cloud computing environments. Students will also engage in oral and written communication to report digital forensic findings and prepare court presentation materials.

CYSE 615. Mobile and Wireless Security. 3 Credits.
An overview of wireless and mobile security providing students with practical and theoretical experiences. Topics include smartphone security, mobile Internet security, mobile location privacy, and wireless ad hoc, mesh, and sensor network security.

CYSE 625. Advanced Ethical Hacking and Penetration Testing. 3 Credits.
This course teaches students the underlying principles and many of the techniques associated with the cybersecurity practice known as penetration testing or ethical hacking. The course covers planning, reconnaissance, scanning, exploitation, post-exploitation, and result reporting. Students will discover how system vulnerabilities can be exploited and learn to avoid such problems.

CYSE 697. Independent Study in Cybersecurity. 3 Credits.
This course allows students to develop specialized expertise by independent study (supervised by a faculty member).

CYSE 698. Master's Project. 3 Credits.
This capstone course provides opportunities to synthesize and apply the knowledge and skills to solve real-world cyber security problems.