

# CYBERSECURITY ENGINEERING (CDE)

## **CDE 130 Core Concepts in Cybersecurity**

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

An introduction to core concepts in cybersecurity which prepares students for all future courses in the Cybersecurity Engineering Program. This course provides a broad overview of the field of cybersecurity. The course covers history, terminology and strategies involved in securing information assets and serves as a foundation course for more advanced studies in information, network and computer security. General and specific threats to information assets and defensive strategies for protecting those assets are covered. The course employs an integrated system of skill-building lessons, hands-on exercises, and self-assessment tools. Students will also explore the network of physical devices, vehicles, home appliances, and other items dubbed the Internet of Things. The course will also focus on highlighting how devices interact, share data and affect everyday life by combining a mixture of hardware and software.

## **CDE 250 Windows Server and Active Directory Security**

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 241

Students will learn how to configure and manage a Microsoft Windows-based Active Directory network environment through an integrated system of skill-building lessons, hands-on exercises, and self-assessment tools. Students will also learn how to secure and troubleshoot a Microsoft Windows-based Active Directory network environment through an integrated system of skill-building lessons, hands-on exercises, and self-assessment tools.

## **CDE 255 Cryptography**

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: MA 355

An introductory course on how cryptography and hashing work. Students will explore how to use cryptography for authentication, integrity, confidentiality, and other security practices.

## **CDE 380 Cybersecurity Engineering Control Systems**

4 Class Hours, 2 Lab Hours, 5 Quarter Credit Hours

Prerequisites: ME 260

Free and forced vibration problems for damped and undamped systems are analyzed and modeled, with applications to typical mechanical, hydraulic, pneumatic, and thermal systems. Feedback control is considered. Mathematical models are explored using MATLAB and Simulink.

## **CDE 382 Cloud Security**

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: IT 379

With an emphasis on IAM when migrating to cloud, this course gives students an overall understanding of cloud computing concepts, independent of specific technical roles. It provides a detailed overview of cloud concepts, AWS core services, security, architecture, and support. Students are introduced to database administration for relational, NoSQL and cloud systems. Successful completion of this course prepares the student to sit for the AWS Cloud Foundations Certification Exam.

## **CDE 395 Cybersecurity Engineering Ethics**

2 Class Hours, 2 Quarter Credit Hours

In this course, students will analyze, review, and discuss ethical topics and situations relevant to the Cybersecurity Engineering industry.

## **CDE 399 Pre-Co-Op**

2 Class Hours, 2 Quarter Credit Hours

In this course, students will be introduced to and prepare for their upcoming co-operative experience opportunity. This course will focus on building career skills and cover resume writing and interview preparation and etiquette. Additionally, students will learn how to research co-operative opportunities and the general procedure of how their co-op will run. Students will prepare for their co-op interviews and learn how to choose an experience based on their technical and personal experience-based skills.

## **CDE 405 Digital Forensics**

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Introduces both network and file system forensics. Covers search, acquisition, and other evidentiary procedures.

## **CDE 420 Embedded System Security**

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: ME 260

This course will integrate with students' previous course knowledge to take a deeper dive into the hardware-software relationships involved in a range of computerized technical systems.

## **CDE 490 Introduction to Senior Capstone**

2 Class Hours, 2 Quarter Credit Hours

In this course, students will learn how to self-direct a major project. Exploration of potential topics and projects for the Capstone class will be introduced, and students will plan their upcoming final projects.

## **CDE 495 Cybersecurity Engineering Capstone**

5 Class Hours, 2 Lab Hours, 6 Quarter Credit Hours

Prerequisites: CDE 490

In this course, students culminate their time in the program with a capstone project showcasing their learned skills. Students will work with a faculty member to utilize their skills learned in the program to individually design, create, and implement a Cybersecurity project. These projects will be presented to the entire cohort and undergraduates, core faculty, and co-operative representatives.

## **CDE 496 Co-Op**

35 Lab Hours, 12 Quarter Credit Hours

Prerequisites: CDE 399

Students will participate in a 17-week intensive Co-Op full-time work experience in a position related to the student's program of study. During this time, students will have real-world application of skills acquired during the program while maintaining a full-time position with an employer from industry. Enrollment in this course maintains full-time student status.

## **CDE 499 Co-Op Reflection**

1 Class Hours, 1 Quarter Credit Hours

Prerequisites: CDE 399 and CDE 496

In this course, students will reflect on their Co-Op experience and how to best apply it in their upcoming Senior Capstone Project and their careers. This course culminates in a presentation-based reflection.