

Cybersecurity BS, Computer Science Emphasis

The joint Interdisciplinary B.S. in Cybersecurity is designed for students who wish to pursue high-demand work roles such as cybersecurity specialist, cyber defense analyst, cyber defense incident responder, information security analyst, vulnerability assessment analyst, security architect, among a variety of other entry to mid-level cybersecurity and computing related fields. The Computer Science emphasis focuses on more technical aspects of the field. The entire program can be completed in the evening or online.

Students must choose one of the following emphasis areas at the time of application for admission.

- Computer Science (CS) Emphasis
- Information Systems and Technology (IST) Emphasis

Degree requirements vary depending on the chosen emphasis area (see common and emphasis area required courses and credit hours below).

General Education Requirements

Students must satisfy the university general education requirements. Many of the courses for the degree may be used to fulfill general education requirements. There is no foreign language requirement for this degree.

Satisfactory/Unsatisfactory Option

Courses required for the major may not be taken on a satisfactory/unsatisfactory basis.

Required Courses

The degree requires 24 credit hours of core coursework applicable to both emphasis areas. Emphasis specific required courses are listed below. Please see 4-year degree plans for recommend course sequences within each emphasis.

Required Core Courses

| | | |
|--------------------------------|---|-----------|
| ENGL 3120 or ENGL 3130 | Business Writing Technical Writing | 3 |
| CMP SCI 1250 | Introduction to Computing | 3 |
| CMP SCI 2250 | Programming and Data Structures | 3 |
| CMP SCI 2700 | Computer Organization and Architecture | 3 |
| CMP SCI 2750 | Linux Environment and Programming | 3 |
| INFSYS 3848 or CMP SCI 3702 | Introduction to Information Security Introduction to Cyber Threats and Defense | 3 |
| INFSYS 3868 | Secure Software Development | 3 |
| INFSYS 3878 | Information Security Risk Management and Business Continuity | 3 |
| Total Hours | | 24 |

Emphasis Area Requirements

In addition to the 24 credit hours of core required coursework, the B.S. Cybersecurity degree with Computer Science emphasis requires 51-53 credit hours of emphasis-specific course work. Thus, candidates for the B.S. in Cybersecurity degree with Computer Science emphasis must complete a major program of 75-77 (24 core + 51-53 emphasis-specific) credit hours of required courses.

For the Computer Science emphasis all general degree requirements from the College of Arts and Science apply.

| | | |
|---|--|--------------|
| MATH 1320 | Introduction to Probability and Statistics | 3 |
| MATH 1100 or MATH 1800 | Basic Calculus Analytic Geometry and Calculus I | 3-5 |
| MATH 3000 | Discrete Structures | 3 |
| CMP SCI 2261 | Object-Oriented Programming | 3 |
| CMP SCI 3010 | Web Full Stack Development | 3 |
| CMP SCI 3130 | Design and Analysis of Algorithms | 3 |
| CMP SCI 3780 | Software Security | 3 |
| CMP SCI 4700 | Computer Forensics | 3 |
| CMP SCI 4730 | Computer Networks and Communications | 3 |
| CMP SCI 4732 | Introduction to Cryptography for Computer Security | 3 |
| CMP SCI 4750 | Introduction to Cloud Computing | 3 |
| CMP SCI 4760 | Operating Systems | 3 |
| CMP SCI 4782 | Information Security | 3 |
| CMP SCI 4794 | Introduction to Security of IoT Systems | 3 |
| Electives | | 9 |
| Choose three of the following: | | |
| PHIL 1160 | Critical Thinking (MOTR PHIL 101) | |
| PHIL 2254 | Business Ethics | |
| CRIMIN 1100 | Introduction to Criminology and Criminal Justice | |
| CRIMIN 3310 | Computers in Criminal Justice | |
| CMP SCI 3990 | Undergraduate Internship | |
| CMP SCI 4020 | Introduction to Android Apps: Android Fundamentals | |
| CMP SCI 4220 | Introduction to iOS Programming and Apps | |
| CMP SCI 4222 | iOS Apps | |
| CMP SCI 4300 | Introduction to Artificial Intelligence | |
| CMP SCI 4500 | Introduction to the Software Profession | |
| CMP SCI 4610 | Database Management Systems | |
| CMP SCI 4792 | Introduction to Mobile Computing, Networking, and Security | |
| INFSYS 3858 | Advanced Security and Information Systems | |
| INFSYS 3898 | Seminar in Information Systems | |
| Other electives upon approval of Computer Science chair | | |
| Total Hours | | 51-53 |

Learning Outcomes

1. Understand and Describe the Confidentiality, Integrity, and Availability security objectives and key security principles that enable the development of security mechanisms
2. Demonstrate an understanding of physical, data link, network, transport, and application layers of data networking and identify potential information security pitfalls at each layer
3. Describe important secure software development principles and common web application security vulnerabilities
4. Describe common applications of cryptographic, network, application, and systems security defense mechanisms to improve information security
5. Understand the role of systematic information security risk management in fostering information security within organizations and the role of management and control frameworks such as NIST Special Publications and ISO 27000 series standards in doing so.

| | | |
|--|---------------------|-----------|
| CMP SCI 3XXX Computer Science Elective | 3 Elective or minor | 3 |
| | Elective or minor | 1 |
| | 12 | 13 |

Total Hours: 120

1

INTDSC 1003 is required only for first-time freshmen and transfer students with less than 24 college credits.

PLEASE NOTE: This plan is an example of what a four year plan could look like for a typical student. Placement exam scores in math as well as the completion of coursework may change the plan. It should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor each semester. All requirements are subject to change.

Sample Four Year Plan

First Year

| Fall | Hours | Spring | Hours |
|------------------------------------|-----------|--------------------------------------|-----------|
| INTDSC 1003 ¹ | | 1 CMP SCI 1250 | 3 |
| ENGL 1100 | | 3 MATH 1800 | 5 |
| MATH 1030 | | 3 CORE - US History and Government | 3 |
| MATH 1035 | | 2 EXPLORE - Humanities and Fine Arts | 3 |
| EXPLORE - Humanities and Fine Arts | | 3 EXPLORE - Social Sciences | 3 |
| EXPLORE - Social Sciences | | 3 | |
| | 15 | | 17 |

Second Year

| Fall | Hours | Spring | Hours |
|------------------------------------|-----------|------------------------------------|-----------|
| CMP SCI 2250 | | 3 CMP SCI 2261 | 3 |
| CMP SCI 2700 | | 3 CMP SCI 2750 | 3 |
| MATH 1320 | | 3 CMP SCI 3010 | 3 |
| MATH 3000 | | 3 INFSYS 3848 | 3 |
| EXPLORE - Humanities and Fine Arts | | 3 CORE - Communication Proficiency | 3 |
| | 15 | | 15 |

Third Year

| Fall | Hours | Spring | Hours | Summer | Hours |
|--------------|-----------|--|-----------|----------------|----------|
| CMP SCI 3130 | | 3 CMP SCI 3702 | 3 | 3 CMP SCI 4732 | 3 |
| CMP SCI 3780 | | 3 CMP SCI XXXX Computer Science Elective | 3 | | |
| CMP SCI 4730 | | 3 CMP SCI XXXX Computer Science Elective | 3 | | |
| INFSYS 3878 | | 3 INFSYS 3868 | 3 | | |
| ENGL 3130 | | 3 EXPLORE - Social Sciences | 3 | | |
| | 15 | | 15 | | 3 |

Fourth Year

| Fall | Hours | Spring | Hours |
|--------------|-------|----------------------------------|-------|
| CMP SCI 4700 | | 3 CMP SCI 4782 | 3 |
| CMP SCI 4750 | | 3 CMP SCI 4760 | 3 |
| CMP SCI 4794 | | 3 Cultural Diversity Requirement | 3 |