

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.

Bachelor of Science (B.S.) in Cybersecurity

Degree Requirements

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

- Computer Science (CS) Emphasis (total 120 credit hours)
- Information Systems (IS) Emphasis (total 123 credit hours)

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 33 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 2261	Object-Oriented Programming	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
CMP SCI 4700	Computer Forensics	3
CMP SCI 4732	Introduction to Cryptography for Computer Security	3

Total Hours 33

Computer Science Emphasis

In addition to the 33 credit hours of core required coursework, the B.S. Cybersecurity degree with Computer Science emphasis requires 42-44 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 (33 core + 42-44 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 3010	Web Programming	3
CMP SCI 3130	Design and Analysis of Algorithms	3
CMP SCI 3780	Software Security	3
CMP SCI 4730	Computer Networks and Communications	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 (choose 3 from following) 9

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 department chair

Total Hours **42-44**

Information Systems Emphasis

In addition to the 33 credit hours of core required coursework, the B.S. Cybersecurity degree with Information Systems emphasis requires 75 credit hours of emphasis specific coursework (48 general business + 27 program specific). Thus, candidates for the B.S. in Cybersecurity degree with Information Systems emphasis must complete a program of 108 (33 core + 75 emphasis specific) credit hours of required courses.

For the Information Systems emphasis all general degree requirements from the College of Business Administration apply.

INFSYS 3820	Introduction to Systems Administration	3
INFSYS 3842	Data Networks and Security	3
INFSYS 3806	Managerial Applications of Object-Oriented Programming I	3
INFSYS 3815	Object-Oriented Applications in Business	3
INFSYS 3845	Database Management Systems	3
INFSYS 3858	Advanced Security and Information Systems	3
SCMA 4347	Introduction to Project Management	3
Major Specific Electives (choose 2 from following)		6
BUS AD 3090	Internship in Business Administration	
INFSYS 3830	Data Programming	
INFSYS 3862	Artificial Intelligence Applications for Business	
INFSYS 3864	Applied Cryptography for Business	
INFSYS 3898	Seminar in Information Systems ¹	
CMP SCI 4782	Information Security	
CMP SCI 4750	Introduction to Cloud Computing	
SCMA 3345	Predictive Analytics and Data Mining	
SCMA 4350	Prescriptive Analytics and Optimization	
SCMA 3376/MKTG 3776		
Other electives upon approval of Information Systems department chair		
Total Hours		27

¹ If course is offered and topic is approved by the Information Systems department chair

Emphasis Area Requirements

In addition to the 33 credit hours of core required coursework, the B.S. Cybersecurity degree with Computer Science emphasis requires 42-44 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 (33 core + 42-44 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 3010	Web Programming	3
CMP SCI 3130	Design and Analysis of Algorithms	3
CMP SCI 3780	Software Security	3
CMP SCI 4730	Computer Networks and Communications	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
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		42-44

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.

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 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		
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.