

Cybersecurity, MS

Our Master of Science in Cybersecurity combines a solid understanding of information security technology with relevant knowledge from law, the social sciences, criminology, and management. The MS program is designed for working professionals and also recent graduates who want knowledge they can apply in workplaces to assess and manage information security risks effectively.

The cybersecurity program provides graduates with both the theoretical and experimental skills to perform professional cybersecurity duties. Due to the broad variety of positions that cybersecurity professionals may hold in the industry, our curriculum is designed to provide enough flexibility to our students to tailor their own career appropriately.

The cybersecurity curriculum is intended to provide a comprehensive approach to cybersecurity, which includes both the technical skills and the contextual understanding that are fundamental to cybersecurity professions.

CONCENTRATION IN CRIMINOLOGY

Cybercrime has evolved into more advanced techniques and sophisticated structures. Cybersecurity professionals are of vital importance in crime investigations, and for that reason they need to have a well-rounded background and knowledge. The Master of Science in Cybersecurity provides an interdisciplinary foundation that includes computer science technical courses, complemented with the contextual knowledge courses required for a proper holistic approach to cybercrime. The concentration in criminology and criminal justice will offer MSCY students an opportunity to obtain the fundamental principles and the most important practices that criminal justice professionals use.

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Cybersecurity with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Cybersecurity in addition to earning a Graduate Certificate in Engineering Leadership (<http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/>). Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The certificate program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour master's degree and certificate require 24 hours from the Master of Science in Cybersecurity (MS required courses, technical track, and contextual track).

The MS in Cybersecurity—Align program to the interdisciplinary Master of Science in Cybersecurity is designed for students with a BS/BA degree from all backgrounds. During the first semester of year one, students are expected to take foundational courses in computer science fundamentals, as well as a course in data structures/discrete mathematics. During their second semester, students will take coursework in object-oriented design, as well as introductions to algorithms and computer systems.

Standard Program Requirements

Core Requirements

Code	Title	Hours
Foundations		
CY 5001	Cyberspace Technology and Applications ¹	4
CY 5010	Foundations of Information Assurance	4
Technical Track		
Complete 8 semester hours from the following:		8
CY 5120	Applied Cryptography	
CY 5130	Computer System Security	
CY 5150	Network Security Practices	
CY 5770	Software Vulnerabilities and Security	
CY 6120	Software Security Practices	
CY 6740	Network Security	
CY 6760	Wireless and Mobile Systems Security	
Contextual Track		
Complete 8 semester hours from the following:		8
CY 5200	Security Risk Management and Assessment	
CY 5210	Information System Forensics	
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
CY 5250	Decision Making for Critical Infrastructure	
CY 6200	Special Topics in IT Security Governance, Risk, and Compliance	
CY 6240	Special Topics in Privacy Law	

Capstone

CY 7900	Capstone Project	4
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Electives

Code	Title	Hours
Complete 4 semester hours from the following:		4
CS 5200	Database Management Systems	
CS 5500	Foundations of Software Engineering	
CS 5600	Computer Systems	
CS 5610	Web Development	
CS 5700	Fundamentals of Computer Networking	
CS 6710	Wireless Network	
CS 7580	Special Topics in Software Engineering	
CS 7805	Complexity Theory	
CY 5040	Introduction to Cyberspace Programming 2	
CY 5061	Cloud Security	
CY 5062	Introduction to IoT Security	
CY 5120	Applied Cryptography	
CY 5130	Computer System Security	
CY 5150	Network Security Practices	
CY 5200	Security Risk Management and Assessment	
CY 5210	Information System Forensics	
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
CY 5770	Software Vulnerabilities and Security	
CY 6120	Software Security Practices	
CY 6200	Special Topics in IT Security Governance, Risk, and Compliance	
CY 6240	Special Topics in Privacy Law	
CY 6720	Machine Learning in Cybersecurity and Privacy	
CY 6740	Network Security	
CY 6750	Cryptography and Communications Security	
CY 6760	Wireless and Mobile Systems Security	
CY 7790	Special Topics in Security and Privacy	
CRIM 6200	Criminology	
CRIM 6202	The Criminal Justice Process	
CRIM 6262	Evidence-Based Crime Policy	
PPUA 6503	Managing People in Public and Nonprofit Sectors	
POLS 7341	Security and Resilience Policy	
POLS 7441	Cyberconflict	

Concentration in Criminology

This concentration's required courses may count toward the contextual track, and its elective may count toward the major's elective area.

Code	Title	Hours
Required		8
CRIM 6200	Criminology	
CRIM 6202	The Criminal Justice Process	
Complete one of the following:		4
CRIM 6262	Evidence-Based Crime Policy	
CY 5250	Decision Making for Critical Infrastructure	
CRIM elective ²		

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

1

A student who demonstrates prior mastery of the learning outcomes for Cyberspace Technology and Applications (CY 5001) may replace the course with elective coursework to meet the semester hours required for the degree. See the electives list for options.

2

CRIM elective to be approved by director/associate director of MSCY.

Align Program Requirements

Align Bridge Coursework

A grade of B or higher is required in each course.

Code	Title	Hours
Students will be required to complete two or more of the following bridge courses to be determined by faculty mentor.		
Fundamentals		
CS 5001 and CS 5003	Intensive Foundations of Computer Science and Recitation for CS 5001	8
Discrete Structures		
CS 5002	Discrete Structures	
Cybersecurity		
CY 5001	Cyberspace Technology and Applications	
Additional Align Courses		
CS 5008 and CS 5009	Data Structures, Algorithms, and Their Applications within Computer Systems and Recitation for CS 5008	

Core Requirements

Code	Title	Hours
Foundations		
CY 5010	Foundations of Information Assurance	4
Technical Track		
Complete 8 semester hours from the following:		8
CY 5120	Applied Cryptography	
CY 5130	Computer System Security	
CY 5150	Network Security Practices	
CY 5770	Software Vulnerabilities and Security	
CY 6120	Software Security Practices	
CY 6740	Network Security	
CY 6760	Wireless and Mobile Systems Security	
Contextual Track		
Complete 8 semester hours from the following:		8
CY 5200	Security Risk Management and Assessment	
CY 5210	Information System Forensics	
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
CY 5250	Decision Making for Critical Infrastructure	
CY 6200	Special Topics in IT Security Governance, Risk, and Compliance	
CY 6240	Special Topics in Privacy Law	
Capstone		
CY 7900	Capstone Project	4

Electives

Code	Title	Hours
Complete 4 semester hours from the following:		
CRIM 6200	Criminology	
CRIM 6202	The Criminal Justice Process	
CRIM 6262	Evidence-Based Crime Policy	
CS 5200	Database Management Systems	
CS 5500	Foundations of Software Engineering	

CS 5600	Computer Systems
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 6710	Wireless Network
CS 7580	Special Topics in Software Engineering
CS 7805	Complexity Theory
CY 5040	Introduction to Cyberspace Programming 2
CY 5061	Cloud Security
CY 5062	Introduction to IoT Security
CY 5120	Applied Cryptography
CY 5130	Computer System Security
CY 5150	Network Security Practices
CY 5200	Security Risk Management and Assessment
CY 5210	Information System Forensics
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights
CY 5770	Software Vulnerabilities and Security
CY 6120	Software Security Practices
CY 6200	Special Topics in IT Security Governance, Risk, and Compliance
CY 6240	Special Topics in Privacy Law
CY 6720	Machine Learning in Cybersecurity and Privacy
CY 6740	Network Security
CY 6750	Cryptography and Communications Security
CY 6760	Wireless and Mobile Systems Security
POLS 7341	Security and Resilience Policy
POLS 7441	Cyberconflict
PPUA 6503	Managing People in Public and Nonprofit Sectors

Concentration in Criminology

This concentration's required courses may count toward the contextual track, and its elective may count toward the major's elective area.

Code	Title	Hours
Required		8
CRIM 6200	Criminology	
CRIM 6202	The Criminal Justice Process	
Complete one of the following:		4
CRIM 6262	Evidence-Based Crime Policy	
CY 5250	Decision Making for Critical Infrastructure	
CRIM elective ¹		

Program Credit/GPA Requirements

36–44 total semester hours required

Minimum 3.000 GPA required

1

CRIM elective to be approved by director/associate director of MSCY.