

# Cybersecurity, BS

The Bachelor of Science in Cybersecurity teaches students the conceptual and practical skills that will enable them to contribute to ensuring the reliability and security of cyberspace. The program will provide students with the fundamental knowledge of computer science that forms the technical foundation of the field, with an essential focus on experiential learning through laboratory exercises in the security-related courses, as well as through the co-op program. The program's holistic view of cybersecurity gives it a strong interdisciplinary focus, teaching students how social behavior, policy, and legal rules can affect cybersecurity and the tools of information technology.

## Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

## University-Wide Requirements

All undergraduate students are required to complete the University-Wide Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<http://catalog.northeastern.edu/undergraduate/university-academics/nuopath>).

## Cybersecurity Major Requirements

Code	Title	Hours
<b>Computer Science Overview</b>		
CS 1200	Leadership Skill Development	1
CS 1210	Professional Development for CCIS Co-op	1
<b>Computer Science Fundamental Courses</b>		
A grade of C– or higher is required in computer science fundamental courses:		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 2500 and CS 2501	Fundamentals of Computer Science 1 and Lab for CS 2500	5
CS 2510 and CS 2511	Fundamentals of Computer Science 2 and Lab for CS 2510	5
<b>Computer Science Required Courses</b>		
CS 3000	Algorithms and Data	4
CS 3500	Object-Oriented Design	4
CS 3650	Computer Systems	4
CS 3700	Networks and Distributed Systems	4
CS 3800	Theory of Computation	4
<b>Presentation Requirement</b>		
THTR 1170	The Eloquent Presenter	1
<b>Cybersecurity Required Courses</b>		
CS 2550	Foundations of Cybersecurity	4
CS 3740	Systems Security	4

CS 4170	The Law, Ethics, and Policy of Data and Digital Technologies	4
or IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
CS 4740	Network Security	4
CS 4770	Cryptography	4
CS 4930	Cybersecurity Capstone	4
or CS 4940	Research Projects on National Security	

## Cybersecurity Electives

If courses require prerequisites, those should be taken using general electives.

Complete five courses from the following, at least one of which must come from the cybersecurity and social issues elective list: 20-22

CS 2800 and CS 2801	Logic and Computation and Lab for CS 2800	
CS 4710 or CS 6710	Mobile and Wireless Systems Wireless Network	
CS 5770	Software Vulnerabilities and Security	
CS 4400	Programming Languages	
CS 4500 and CS 4501	Software Development and Recitation for CS 4500	
CS 4240	Large-Scale Parallel Data Processing	
DS 4300	Large-Scale Information Storage and Retrieval	
DS 4400	Machine Learning and Data Mining 1	
IA 5200	Security Risk Management and Assessment	
IA 5210 and IA 5211	Information System Forensics and Lab for IA 5210	
IS 4300	Human Computer Interaction	
EECE 2322 and EECE 2323	Fundamentals of Digital Design and Computer Organization and Lab for EECE 2322	
EECE 3324	Computer Architecture and Organization	
EECE 4534 and EECE 4535	Microprocessor-Based Design and Lab for EECE 4534	
MATH 3527	Number Theory 1	
MATH 4575	Introduction to Cryptography	
MISM 2301 or MISM 2309	Management Information Systems Management Information Systems	
<b>Cybersecurity and Social Issues Elective List</b>		
COMM 2551	Free Speech in Cyberspace	
CRIM 2200	Criminology	
CRIM 3400	Corporate Security: Securing the Private Sector	
CRIM 4040	Crime Prevention	
LPSC 1101	Introduction to Law	
LPSC 2301	Introduction to Law, Policy, and Society	
LPSC 3303	Topics in Law and Public Policy	
POLS 2390	Science, Technology, and Public Policy	
POLS 3307	Public Policy and Administration	

POLS 3324	Law and Society
POLS 3406	International Law
POLS 3408	International Security
POLS 3420	U.S. National Security Policy
POLS 3423	Terrorism and Counterterrorism

### Concentration in Cyber Operations (Optional)

Code	Title	Hours
<b>Cyber Operations Required Courses</b>		
CS 4710	Mobile and Wireless Systems	4
CS 5770	Software Vulnerabilities and Security	4
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	4

#### Electives

Complete two of the following:		8
CS 4500 and CS 4501	Software Development and Recitation for CS 4500	
CS 4240	Large-Scale Parallel Data Processing	
EECE 3324	Computer Architecture and Organization	
EECE 4534	Microprocessor-Based Design	
IA 5200	Security Risk Management and Assessment	
IA 5210 and IA 5211	Information System Forensics and Lab for IA 5210	

### Supporting Courses

Code	Title	Hours
<b>Electrical Engineering Required Course</b>		
EECE 2160	Embedded Design: Enabling Robotics	4
<b>Mathematics Courses</b>		
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 3081	Probability and Statistics	4

### Writing Requirements

Code	Title	Hours
<b>College Writing</b>		
ENGW 1111	First-Year Writing	4
<b>Advanced Writing in the Disciplines</b>		
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

### Required General Electives

Code	Title	Hours
Complete seven general electives.		28

### Major GPA Requirement

Minimum 2.000 GPA required in all CS and IS courses

### Computer Science Credit Requirements

Complete 80 semester hours in the major.

### NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Analyzing and Using Data
- Writing in the First Year
- Advanced Writing in the Disciplines
- Writing-Intensive in the Major
- Demonstrating Thought and Action in a Capstone

*Integrating Knowledge and Skills Through Experience* is satisfied through co-op.

### Program Requirement

133 semester hours required

### Plan of Study

#### Sample Plan of Study

#### FOUR YEARS, TWO CO-OPS IN SUMMER 2/FALL

##### Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1200	1	CS 2510 and CS 2511	5	CS 3500	4	Vacation	0
CS 1800 and CS 1801	4	CS 2550	4	MATH 1342	4		
CS 2500 and CS 2501	5	MATH 1341	4				
ENGW 1111	4	General elective 2	4				
General elective 1	4						
		18		17		8	

##### Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1210	1	CS 3700	4	ENGW 3302 or 3315	4	Co-op	0
CS 3650	4	CS 3740	4	MATH 3081	4		
CS 3800	4	CS 4770	4				
CS 3000	4	General elective 4	4				
General elective 3	4	CS 1210	1				
		17		17		8	

##### Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		CS 4740	4	General elective 5	4	Co-op	0
		IA 5240	4	EECE 2160	4		
		Cybersecurity elective	4				
		Cybersecurity elective	4				
		0		16		8	

##### Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours
Co-op		THTR 1170	1	(If needed)	0
		CS 4930 or 4940	4	General elective 6	4

Cybersecurity elective	4	General elective 7	4
Cybersecurity elective	4		
Cybersecurity elective	4		
0	17	8	

Cybersecurity elective 4	4
Cybersecurity elective 5 / social issues	4
0	16

Total Hours: 132

Total Hours: 134

**FIVE YEARS, THREE CO-OPS IN SUMMER 2/FALL**

**Year 1**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1200	1	CS 2510	4	CS 3500	4	Vacation	
CS 2500	4	CS 2511	1	MATH 1342	4		
CS 2501	1	CS 2550	4				
ENGW 1111	4	MATH 1341	4				
General elective 1	4	General elective 2	4				
CS 1800	4						
CS 1801	0						
	18		17		8		0

**Year 2**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 3000	4	CS 3700	4	Vacation		Co-op	
CS 3650	4	CS 3740	4				
MATH 3081	4	General elective 4	4				
General elective 3	4	General elective 5	4				
THTR 1170	1						
	17		16		0		0

**Year 3**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		CS 4740	4	ENGW 3302	4	Co-op	
		CS 3800	4	General elective 7	4		
		EECE 2160	4				
		General elective 6	4				
	0		16		8		0

**Year 4**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		IA 5240	4	Vacation		Co-op	
		CS 4770	4				
		Cybersecurity elective 1	4				
		Cybersecurity elective 2	4				
	0		16		0		0

**Year 5**

Fall	Hours	Spring	Hours
Co-op		CS 4930	4
		Cybersecurity elective 3	4