

# Cybersecurity and Economics, BS

The cybersecurity and economics combined degree applies a multidisciplinary approach integrating fundamental economics courses with a strong programming foundation. Students will study both the behavior of individuals and the collective behavior of industries and governments, utilizing computing skills to ensure the reliability and security of cyberspace.

## Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

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.

## Universitywide Requirements

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

## NUpath Requirements

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

## Cybersecurity Major Requirements

| Code   | Title   | Hours |
|--|---|-------|
| <b>Computer Science Overview</b>             |   |       |
| CS 1200<br>or ECON 1000                      | First Year Seminar<br>Economics at Northeastern   | 1     |
| CS 1210<br>or EESH 2000                      | Professional Development for Khoury Co-op<br>Professional Development for Co-op                               | 1     |
| <b>Computer Science Fundamentals Courses</b> |   |       |
| CS 1800<br>and CS 1802                       | Discrete Structures<br>and Seminar for CS 1800  | 5     |
| CS 2500<br>and CS 2501                       | Fundamentals of Computer Science 1<br>and Lab for CS 2500   | 5     |
| CS 2510<br>and CS 2511                       | Fundamentals of Computer Science 2<br>and Lab for CS 2510   | 5     |
| <b>Computer Science Required Courses</b>     |   |       |
| CS 3000                                      | Algorithms and Data   | 4     |
| CS 3500<br>and CS 3501                       | Object-Oriented Design<br>and Lab for CS 3500   | 5     |
| CS 3650                                      | Computer Systems  | 4     |
| CS 4700<br>or CS 4730                        | Network Fundamentals<br>Distributed Systems   | 4     |
| <b>Cybersecurity Required Courses</b>        |   |       |
| CY 2550                                      | Foundations of Cybersecurity  | 4     |
| CY 3740                                      | Systems Security  | 4     |
| CY 4170<br>or CY 5240                        | The Law, Ethics, and Policy of Data and Digital Technologies<br>Cyberlaw: Privacy, Ethics, and Digital Rights | 4     |
| CY 4740                                      | Network Security  | 4     |
| <b>Cybersecurity Elective</b>                |   |       |
| Complete one of the following:               |   | 4     |
| COMM 2551                                    | Free Speech in Cyberspace   |       |

|                            |   |
|----------------------------|---|
| CRIM 2340                  | Corporate Security: Securing the Private Sector                                   |
| CRIM 3030                  | Global Criminology  |
| CRIM 4040                  | Crime Prevention  |
| CS 2800                    | Logic and Computation   |
| CS 4400                    | Programming Languages   |
| CS 4500                    | Software Development  |
| or CS 4530                 | Fundamentals of Software Engineering  |
| CS 4710                    | Mobile and Wireless Systems   |
| CY 4760                    | Security of Wireless and Mobile Systems   |
| CY 4770                    | Cryptography  |
| CY 5200                    | Security Risk Management and Assessment   |
| CY 5210                    | Information System Forensics  |
| DS 4300                    | Large-Scale Information Storage and Retrieval                                     |
| DS 4400                    | Machine Learning and Data Mining 1  |
| EECE 2310<br>and EECE 2311 | Introduction to Digital Design and Computer Architecture<br>and Lab for EECE 2310 |
| EECE 3324                  | Computer Architecture and Organization  |
| EECE 4534<br>and EECE 4535 | Microprocessor-Based Design<br>and Lab for EECE 4534                              |
| IS 4300                    | Human Computer Interaction  |
| LPSC 1101                  | Introduction to Law   |
| LPSC 2301                  | Introduction to Law, Policy, and Society  |
| LPSC 3303                  | Topics in Law and Public Policy   |
| MATH 3527                  | Number Theory 1   |
| MATH 4575                  | Introduction to Cryptography  |
| PHIL 1145                  | Technology and Human Values   |
| POLS 2390                  | Science, Technology, and Public Policy  |
| POLS 3307                  | Public Policy and Administration  |
| POLS 3324                  | Law and Society   |
| POLS 3406                  | International Law   |
| POLS 3420                  | U.S. National Security Policy   |
| POLS 3423                  | Terrorism and Counterterrorism  |

## Supporting Course

| Code         | Title  | Hours |
|--------------|--|-------|
| MATH 1231    | Calculus for Business and Economics (It is highly recommended that students who take MATH 1231 take sections devoted to econ students only.) | 4     |
| or MATH 1241 | Calculus 1   |       |
| or MATH 1245 | Calculus with Applications   |       |
| or MATH 1251 | Calculus and Differential Equations for Biology 1  |       |
| or MATH 1340 | Intensive Calculus for Engineers   |       |
| or MATH 1341 | Calculus 1 for Science and Engineering   |       |

## Economics Requirements

| Code                    | Title                        | Hours |
|-------------------------|------------------------------|-------|
| <b>Required Courses</b> |                              |       |
| ECON 1115               | Principles of Macroeconomics | 4     |
| ECON 1116               | Principles of Microeconomics | 4     |
| ECON 2315               | Macroeconomic Theory         | 4     |
| ECON 2316               | Microeconomic Theory         | 4     |
| ECON 2350               | Statistics for Economists    | 4     |

### Electives

Complete four ECON electives that are found in the following range with, at most, two at the 1000 level. Unless otherwise noted in specific combined majors, required core economics courses cannot be counted as electives by students completing Department of Economics programs: 16

ECON 1200 to ECON 1999

ECON 2990 to ECON 3559

ECON 3561 to ECON 4689

ECON 4900 to ECON 4996

ECON 5200 to ECON 5999

**Integrative Requirement**

| Code                           | Title   | Hours |
|--------------------------------|---|-------|
| <b>Capstone</b>                |   |       |
| Complete one of the following: |   | 4     |
| CY 4930                        | Cybersecurity Capstone                              |       |
| ECON 4692<br>or ECON 4997      | Senior Economics Seminar<br>Senior Economics Thesis |       |

**Integrative Requirement**

|           |                      |   |
|-----------|----------------------|---|
| ECON 2560 | Applied Econometrics | 4 |
|-----------|----------------------|---|

**Writing Requirement**

| Code                           | Title                                       | Hours |
|--------------------------------|---|-------|
| <b>College Writing</b>         |   |       |
| Complete one of the following: |   | 4     |
| ENGW 1102                      | First-Year Writing for Multilingual Writers |       |
| ENGW 1111                      | First-Year Writing                          |       |

**Advanced Writing in the Disciplines**

|                                |   |   |
|--------------------------------|---|---|
| Complete one of the following: |   | 4 |
| ENGW 3302                      | Advanced Writing in the Technical Professions         |   |
| ENGW 3308                      | Advanced Writing in the Social Sciences               |   |
| ENGW 3311                      | Advanced Writing for Prelaw                           |   |
| ENGW 3315                      | Interdisciplinary Advanced Writing in the Disciplines |   |

**Required General Electives**

| Code   | Title | Hours |
|--|-------|-------|
| Complete 24 semester hours of general electives. |       | 24    |

**Khoury College GPA Requirement**

Minimum cumulative 2.000 GPA required in all CS, CY, DS, and IS courses

**Economics GPA Requirement**

Grades in the following four Economics courses must average to a minimum of C (2.000):

| Code      | Title                     | Hours |
|-----------|---------------------------|-------|
| ECON 2315 | Macroeconomic Theory      |       |
| ECON 2316 | Microeconomic Theory      |       |
| ECON 2350 | Statistics for Economists |       |
| ECON 2560 | Applied Econometrics      |       |

**NUpath Requirements Satisfied**

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Understanding Societies and Institutions
- 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 total 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 | Hours    |  |
| CS 1200                |       | 1 CS 2510<br>and CS 2511                        |       | 5 Elective        |       | 4 Elective |       | 4        |  |
| CS 1800<br>and CS 1802 |       | 5 CY 2550                                       |       | 4 Elective        |       | 4 Elective |       | 4        |  |
| CS 2500<br>and CS 2501 |       | 5 ECON 1116                                     |       | 4                 |       |            |       |          |  |
| ECON 1115              |       | 4 MATH 1231, 1241, 1245,<br>1251, 1340, or 1341 |       | 4                 |       |            |       |          |  |
| ENGW 1111              |       | 4   |       |                   |       |            |       |          |  |
|                        |       | <b>19</b>                                       |       | <b>17</b>         |       | <b>8</b>   |       | <b>8</b> |  |
| Year 2                 |       |   |       |                   |       |            |       |          |  |
| Fall                   | Hours | Spring  | Hours | Summer 1          | Hours | Summer 2   | Hours | Hours    |  |
| CS 3500<br>and CS 3501 |       | 5 CS 1210                                       |       | 1 ECON elective 1 |       | 4 Co-op    |       | 0        |  |
| CS 3650                |       | 4 CS 3000                                       |       | 4 Elective        |       | 4          |       |          |  |
| ECON 2315              |       | 4 CS 4700 or 4730                               |       | 4                 |       |            |       |          |  |
| ECON 2350              |       | 4 ECON 2316                                     |       | 4                 |       |            |       |          |  |
|                        |       | Elective  |       | 4                 |       |            |       |          |  |
|                        |       | <b>17</b>                                       |       | <b>17</b>         |       | <b>8</b>   |       | <b>0</b> |  |
| Year 3                 |       |   |       |                   |       |            |       |          |  |
| Fall                   | Hours | Spring  | Hours | Summer 1          | Hours | Summer 2   | Hours | Hours    |  |
| Co-op                  |       | 0 CY 3740                                       |       | 4 ECON elective 3 |       | 4 Co-op    |       | 0        |  |
|                        |       | ECON 2560                                       |       | 4 ECON elective 4 |       | 4          |       |          |  |
|                        |       | ENGW 3302, 3308, 3311, or<br>3315               |       | 4                 |       |            |       |          |  |
|                        |       | ECON elective 2                                 |       | 4                 |       |            |       |          |  |
|                        |       | <b>0</b>  |       | <b>16</b>         |       | <b>8</b>   |       | <b>0</b> |  |
| Year 4                 |       |   |       |                   |       |            |       |          |  |
| Fall                   | Hours | Spring  | Hours |                   |       |            |       |          |  |
| Co-op                  |       | 0 CY 4170 or 5240                               |       | 4                 |       |            |       |          |  |
|                        |       | CY 4740   |       | 4                 |       |            |       |          |  |
|                        |       | Capstone  |       | 4                 |       |            |       |          |  |
|                        |       | Cybersecurity Elective                          |       | 4                 |       |            |       |          |  |
|                        |       | <b>0</b>  |       | <b>16</b>         |       |            |       |          |  |

**Total Hours: 134**