

CYBERSECURITY AND NETWORK ENGINEERING (BS)

Program Overview Bachelor of Science Degree



The Cybersecurity and Network Engineering program, offered by the Computer Science Department, is designed to prepare graduates for careers in the networking and cybersecurity industries. Through input from a Technical Advisory Committee, professional cybersecurity organizations and local businesses, this program was developed to meet the current cybersecurity needs and those that may arise in the next several years.

From multi-national corporations to local small businesses, cybersecurity defense is an integral piece of an organization's strategy. Information and the technology infrastructure it resides on are two of an organization's most valuable assets and these are often continuously threatened or under active attack. Successful defense and protection of these assets requires a trained cybersecurity professional who not only understands the technical aspects, but also is aware of strategic business interests.

Students begin by studying introductory core concepts in hardware, software, and networking fundamentals layered on a foundation of cybersecurity concepts. Students apply practical cybersecurity theory to real-life cyber incidents and computer system issues in hands-on scenarios. The curriculum focuses on providing students the skillset they need to properly deploy and secure information technology systems in a wide range of environments. Students will learn how operating systems like Linux and Windows along with core networking technology play a critical role in cyber operations. Students are introduced to the current cyber threat landscape and taught how to assess and plan for threats in both the business and personal realms.

In the upper-level courses, students get more extensive experience in the management of Local Area Networks (LANs), intranets, Wide Area Networks (WANs) and exposure to configuring and managing web servers. The curriculum includes core topics in the realm of cybersecurity, such as: computer systems, mobile and network forensics, Windows and Linux security and incident response.

An internship course is available in Term VI, during which students work off-campus in an organization where they will practice and enhance their technical skills. In their senior year, students have an additional opportunity to choose between additional coursework or a cooperative learning experience in their final two terms. In the senior project, each

student works with a faculty member to develop and present a project that focuses in depth on a particular topic and allows students to bring together knowledge gained throughout the program. The cooperative learning experience, based on industry demand and with the approval of the IT Department Chair, may be available during the final two terms of the program. These experiences, which may be paid or unpaid, allow students to receive college credit and to work off campus. Typically, and when available, students will work in the same organization for the final two terms of the bachelor's degree program.

Graduates of this program will be eligible to take such internationally recognized certification exams as the CompTIA A+, Security+ and Network+ exams; the Cisco Certified Network Associate Certification (CCNA) and CCNA Cyber Ops; Microsoft MCP, Microsoft Technology Associate (MTA) Security Fundamentals, and the Microsoft Certified System Administrator (MCSA).

Upon completion of their degrees, graduates can compete for positions like systems operations and maintenance professional, network security specialist, digital forensics and incident response specialist, vulnerability analyst, and LAN managers. Positions in law enforcement will also be attainable. While the emphasis of the program is on network security, graduates are qualified for positions advertised as network administrators, network engineers and network analysts. Upon successful completion of this program, students can also continue into the NEIT Master of Science in Cybersecurity Defense degree program.

Curriculum

Course	Title	Quarter Credit Hours
Term I		
IT 121	IT Visual Communications	3
NE 115	Computer and Networking Fundamentals	3
SE 116	Programming Essentials Using Python	4
Choose one of the following (depending upon Math Placement):		4-5
MA 105	Basic College Math with Lab (MA/SCI Core) ¹	
MA 110	Introduction to College Math (MA/SCI Core) ¹	
Elective	100-200 Level Humanities, Social Sciences, or Arts/Foreign Language Core ¹	
Quarter Credit Hours		14-15
Term II		
CYB 123	Cybersecurity Threats and Defense	3
NE 255	Linux Fundamentals	3
SE 126	Intermediate Programming Using Python	4
EN 100	Introduction to College Writing (COM Core) ¹	4
Quarter Credit Hours		14
Term III		
NE 131	Networking for Small Businesses	3
AI 240	Introduction to Artificial Intelligence	3
SE 111	HTML and JavaScript	4
MA 121	Business Math (MA/SCI Core) ¹	4
EN 200	Workplace Communications (COM Core) ¹	4
Quarter Credit Hours		18

Term IV		
NE 121	Windows Networking Essentials	4
NE 245	Introduction to Networks	4
NE 263	Introduction to Azure Administration	4
MA 125	Technical Math I (MA/SCI Core) ¹	4
Quarter Credit Hours		16
Term V		
CYB 241	Security of the Internet of Things	3
NE 247	Windows Server	4
NE 257	Routing and Switching Essentials	4
Elective	100-200 Level Humanities (or Arts/Foreign Language) Core ¹	4
PHY 200	Physics I & Lab ((MA/SCI Core)) ¹	4
Quarter Credit Hours		19
Term VI		
CYB 252	Cyber Scenarios	1
NE 249	Troubleshooting Fundamentals	4
NE 265	AS Capstone Project	4
Elective	100-200 Level Social Sciences Core ¹	4
Quarter Credit Hours		13
Term VII		
IT 379	Cloud Foundations	4
NE 381	Design and Implementation of an Active Directory Network	4
NE 385	Linux System Administration	4
EN 322	Argumentative Research Writing (COM Core, preferred) ¹	4
Quarter Credit Hours		16
Term VIII		
CYB 394	Windows Security	4
CYB 408	Linux Security	4
NE 411	Microsoft 365	3
MA 210	Technical Math II (MA/SCI Core) ^{1,2}	4
Quarter Credit Hours		15
Term IX		
CYB 373	Ethical Hacking	3
NE 371	Network Scripting	3
NE 415	Scaling Networks	3
Elective	300-400 Level Communications Core ¹	4
Quarter Credit Hours		13
Term X		
IT 374	IT Project Management	3
NE 406	Router Security and Firewall Management	3
NE 407	Virtualization	3
Elective	300-400 Level Humanities or 200 Level Foreign Language Core ¹	4
Elective	300-400 Level Math/Science Core ¹	4
Quarter Credit Hours		17
Term XI		
Choose one of the following options:		13-14
Option 1		
CYB 409	Web Application Security	

CYB 412	Network Security	
NE 418	Network Analysis and Design	
Elective	300-400 Level Social Sciences Core ¹	
Option 2		
IT 415	Cooperative Learning I ³	
Elective	300-400 Level Social Sciences Core ¹	
Choose one of the following:		
CYB 409	Web Application Security	
CYB 412	Network Security	
NE 418	Network Analysis and Design	
Quarter Credit Hours		13-14
Term XII		
NE 425	Network Engineering Senior Project	3
Elective	300-400 Level Humanities, Social Sciences, or 200 Level Foreign Language Core ¹	4
Choose one of the following options:		6-7
Option 1		
CYB 423	Incident Response	
CYB 426	Advanced Information Security	
Option 2		
IT 425	Cooperative Learning II ³	
Quarter Credit Hours		13-14
Total Quarter Credit Hours		181-184

¹ Liberal Arts Core.

² Note: If you had MA 210 Technical Math II in your AS program, you will need to take a Humanities/Social Sciences Core elective in its place.

³ The cooperative learning experience replaces two courses and may be taken with the approval of the IT Department Chair.

Legend

C = Number of lecture hours per week

L = Number of laboratory hours per week

T = Total Quarter Credit Hours where each lecture hour per week is one credit, every 2-4 laboratory hours are one credit depending on the expected amount of pre- or post-lab work.

All bachelor's degree students are required to take 28 credits of liberal arts and math/science courses as selected from the liberal arts core. See the course descriptions section of this catalog for a list of the core area courses.

Subject to change.

Program Mission, Goals, and Outcomes

Program Mission

The mission of the Cybersecurity and Network Engineering bachelor program is to provide preparation for the field of information technology with a focus on cybersecurity and network engineering. Through a combination of theory, labs, and optional field experience, the program emphasizes application of knowledge to the specifications and requirements of the cybersecurity, information assurance, network engineering and computer support industries, and teaches students to strive towards providing and enhancing a productive business environment. The Cybersecurity and Network Engineering bachelor's program is designed to provide more depth and breadth with topics

learned in the Cybersecurity and Network Engineering associate program, and to introduce more advanced concepts and practices with topics beyond what was covered in that program.

Program Goals

1. Through participation in a Senior Project or Internship, provide appropriate learning opportunities for students to acquire the theoretical knowledge, applicable skills, and the professional attitude necessary to function as an IT professional requiring intermediate and advanced skills.
2. Educate students in the skills required to gather and analyze information required to successfully translate business scenarios into technical solutions through appropriate design, implementation, and troubleshooting.
3. Cultivate every student's ability to critically analyze advanced IT problems, and efficiently and correctly troubleshoot those problems.
4. Provide an environment that encourages self-learning and lifelong learning by furthering each student's ability to adapt to and incorporate new concepts, ideas, and evolving technologies.
5. Strive to instill in each student a sense of professional commitment and integrity with respect to the security and privacy of clientele and information, the rights of copyright holders, and the inherent responsibilities of license users.
6. Help prepare students to acquire various entry and intermediate level industry certifications.

Program Outcomes

Graduates of this program will be able to:

1. Apply practical and theoretical network engineering knowledge based upon the foundation concepts defined in an integrated environment, while understanding how proper design applies to information security.
2. Research, formulate and critique security policies regarding the collection, preservation, safeguarding and disposition of personal and organizational information by performing risk management and threat awareness.
3. Create, follow, and meet objectives of a project plan and recognize the need for adaptation, adjustments, and restructuring of the plan, both as an individual IT professional, and in a team environment.
4. Develop organizational business continuity plans and implement them by analyzing digital evidence to determine user and intruder activity on systems.
5. Demonstrate effective oral and written communications with supervisors, subordinates, team members and clients. In particular students should exhibit lucid, clear and concise technical and professional communication as well as be able to communicate complex technical ideas in layman's terms to non-technically trained people.
6. Provide network and system administration support with security auditing services in a responsible and ethical manner that complies with applicable laws and regulatory standards.

Q&A and Technical Standards

Questions & Answers

1. When do my classes meet?

Day Classes: Technical classes normally meet for at least three hours a day for up to five days a week. Classes normally begin in the early

morning (7:45 a.m.), late morning (usually 11:25 a.m.), or mid-afternoon. The time slot for your program may vary from term to term.

Evening Classes: Technical classes meet on the average of three nights a week, although there may be times when they will meet four nights a week. Classes normally begin at 5:45 p.m.

In addition, to achieve your bachelor's degree, you will take a total of approximately seven liberal arts courses, which will be scheduled around your program schedule over the course of your entire program. Each liberal arts course meets approximately four hours per week. Liberal arts courses are offered days, evenings, and Saturdays.

At the beginning of each term you will receive a detailed schedule giving the exact time and location of all your classes. The College requires that all students be prepared to take classes and receive services at any of NEIT's locations where the appropriate classes and services are offered.

When a regularly scheduled class falls on a day which is an NEIT observed holiday (Columbus Day, Veterans Day, Martin Luther King, Jr. Day, and Memorial Day), an alternate class will be scheduled as a make up for that class. The make-up class may fall on a Friday. It is the student's responsibility to take note of when and where classes are offered.

2. How large will my classes be?

The average size for a class is about 20 to 25 students; however, larger and smaller classes occur from time to time.

3. How much time will I spend in lab?

Almost half of your technical courses consist of laboratory work. In order for you to get the most out of your laboratory experiences, you will first receive a thorough explanation of the theory behind your lab work.

4. Where do my classes meet?

Students should be prepared to attend classes at any of NEIT's classroom facilities: either at the Post Road, Access Road, or East Greenwich campus.

5. How long should it take me to complete my program?

To complete your degree requirements in the shortest possible time, you should take the courses outlined in the prescribed curriculum. For a typical six-term curriculum, a student may complete the requirements in as little as 18 months.

To complete all your degree requirements in the shortest time, you should take at least one liberal arts course each term. Students who need more time to complete their curriculum may postpone some of the liberal arts courses until after the completion of the technical requirements. Students are provided up to two additional terms of study to complete the liberal arts requirements without any additional tuition assessment fee. During these additional terms of study, students are required to pay all applicable fees.

Students may also elect to complete some of their liberal arts requirements during Intersession, a five-week term scheduled between Spring and Summer Quarters. Students will not be assessed any additional tuition for liberal arts courses taken during the Intersession but may be assessed applicable fees.

Students wishing to extend the number of terms needed to complete the required technical courses in their curriculum will be assessed additional tuition and fees.

6. Is NEIT accredited?

NEIT is accredited by the New England Commission of Higher Education. Accreditation by NECHE is recognized by the federal government and entitles NEIT to participate in federal financial aid programs. Some academic departments have specialized professional accreditations in addition to accreditation by NECHE. For more information on accreditation, see NEIT's catalog.

7. Can I transfer the credits that I earn at NEIT to another college?

The transferability of a course is always up to the institution to which the student is transferring. Students interested in the transferability of their credits should contact the Office of Teaching and Learning for further information.

8. Can I transfer credits earned at another college to NEIT?

Transfer credit for appropriate courses taken at an accredited institution will be considered upon receipt of an official transcript for any program, biology, science, and mathematics courses in which the student has earned a "C" or above within the past three years and for English or humanities courses in which the student has earned a "C" or above within the last ten years. An official transcript from the other institution must be received before the end of the first week of the term for transfer credit to be granted for courses to be taken during that term. Students will receive a tuition reduction for the approved technical courses based on the program rate and will be applied against the final technical term of the curriculum's tuition amount. No tuition credit is provided for courses which are not a part of the technical curriculum.

9. What is the "Feinstein Enriching America" Program?

New England Institute of Technology is the proud recipient of a grant from the Feinstein Foundation. To satisfy the terms of the grant, the College has developed a one-credit community enrichment course which includes hands-on community enrichment projects. The course can be taken for a few hours per term, spread over several terms. Students who are already engaged in community enrichment on their own may be able to count that service towards course credit.

10. How many credits do I need to acquire my Financial Aid?

In order to be eligible for the maximum financial aid award, you need to maintain at least 12 credits per academic term.

11. What does my program cost?

The cost of your program will be as outlined in your enrollment agreement, along with your cost for books and other course materials. Students who decide to take more terms than the enrollment agreement describes to complete the technical courses in their curriculum will be subject to additional fees and possible additional tuition costs. Students who elect to take the technical portion of the degree requirements at a rate faster than the rate prescribed in the curriculum and the enrollment agreement will be assessed additional tuition.

Students who require prerequisite courses will incur additional tuition and fees above those outlined in their enrollment agreement.

If a student elects to take a course(s) outside of the prescribed curriculum, additional tuition and fees will be assessed.

Remember, students who withdraw and re-enter, one time only, pay the tuition rate that was in effect for them at the time of their last day of attendance for up to one year from their last day of attendance. Second re-entries and beyond pay the tuition rate in effect at the time they re-enter. The most

economical way for you to complete your college degree is to begin your program now and continue your studies straight through for the six terms necessary to complete your degree requirements.

12. What kind of employment assistance does NEIT offer?

The Career Services Office assists NEIT students and graduates in all aspects of the job search, including resume writing, interviewing skills, and developing a job search strategy. Upon completion of their program, graduates may submit a resume to the Career Services Office to be circulated to employers for employment opportunities in their fields. Employers regularly contact us about our graduates. In addition, our Career Services Office contacts employers to develop job leads. A strong relationship with employers exists as a result of our training students to meet the needs of industry for over fifty years. No school can, and NEIT does not, guarantee to its graduates employment or a specific starting salary.

13. Where will job opportunities exist?

Graduates have obtained employment in the local area. However, one of the most exciting aspects of this program is the ability to look nationally for employment opportunities.

14. What kind of jobs will I be qualified to look for?

Generally, jobs will exist in the entry-level positions in the computer industry including positions such as systems operations & maintenance professional, network security specialist, digital forensics and incident response specialist and vulnerability analyst, network administrators, network engineers and network analysts.

Technical Standards

These technical standards set forth by the Computer Science Department establish the essential qualifications considered necessary for students admitted to the program. The successful student must possess the following skills and abilities or be able to demonstrate they can complete the requirements of the program with or without reasonable accommodation, using some other combination of skills and abilities.

Cognitive Ability

- Good reasoning and critical thinking skills.
- Ability to learn, remember and recall detailed information and to use it for problem solving.
- Ability to deal with materials and problems such as organizing or reorganizing information.
- Ability to use abstractions in specific concrete situations.
- Ability to separate complex information into its component parts.
- Ability to perform tasks by observing demonstrations.
- Ability to perform tasks by following written instructions.
- Ability to perform tasks following verbal instructions.
- Possession of basic keyboarding skills and knowledge of computer programs.

Communications Skills

- Ability to speak in understandable English in a classroom situation on a one-on-one basis as well as before a group.
- Ability to communicate effectively with faculty and other students.
- Ability to demonstrate and use the knowledge acquired during the classroom training process.

- Ability to verbally express technical concepts clearly and distinctly.
- Ability to express thoughts clearly.

- For students entering Sequence A April 2020 to March 2021
- For students entering Sequence B April 2020 to March 2021

Adaptive Ability

- Ability to remain calm in the face of computer lab equipment and/or software failure.
- Ability to maintain emotional stability and the maturity necessary to interact with members of the faculty and students in a responsible manner.
- Ability to tolerate the differences in all students, faculty, and administration.
- Ability to follow instructions and complete tasks under stressful and demanding conditions.
- Ability to adapt in a positive manner to new and changing situations with an open mind and flexibility.
- Ability to think clearly and act quickly and appropriately in stressful situations.

Physical Ability

- Ability to sit continuously at a personal computer for long periods of time in order to learn and become proficient in computer programming and networking.
- Ability to perform learned skills independently, with accuracy and completeness within reasonable time frames in accordance with classroom and business procedures.

Manual Ability

- Sufficient motor function and sensory abilities to participate effectively in the classroom laboratory.
- Sufficient manual dexterity and motor coordination to coordinate hands, eyes and fingers in the operation of computers and business equipment.

Sensory Ability

Visual

- Acute enough to see clearly and interpret the contents on the computer screen.

Degree Progress Checklist

Cybersecurity and Network Engineering - BS

Degree Progress Checklists

- For students entering Sequence A October 2024 or later
- For students entering Sequence B October 2024 or later
- For students entering Sequence A April 2023 to September 2024
- For students entering Sequence B April 2023 to September 2024
- For students entering Sequence A October 2022 to March 2023
- For students entering Sequence B October 2022 to March 2023
- For students entering Sequence A April 2022 to September 2022
- For students entering Sequence B April 2022 to September 2022
- For students entering Sequence A April 2021 to March 2022
- For students entering Sequence B April 2021 to March 2022