

CYBERSECURITY (MINOR)

Program Description

Interested in understanding how systems can be hacked? Interested in understanding how systems can be designed to prevent them from being hacked? Want to understand how the latest reflection attack exploits have taken down entire systems? Want to learn the right areas of Computer Security to help you have relevant and useful skills for entering a growing field of industry? This minor may be of interest to you.

The CSE Department has been designated as a Center for Excellence in Cybersecurity Education and Research by the NSA and has an active cadre of students specializing in Cybersecurity, some of whom are supported by the NSF through its Scholarships for Service program. The minor program focuses on the technical aspects of security systems and is geared for those who are enrolled in a technical program in Computer Science or a related field. It covers, at a detailed level, technology that is used to detect security violations, technology that is used to build security appliances, and technology that is used to secure applications.

The program is unique within the NYU academic community and will be of interest to many students majoring in the NYU Tandon School of Engineering's BS programs in Computer Science and Computer Engineering. It may also be appealing to some students in the CAS BA program in Computer Science or related programs.

Students taking the minor must complete several prerequisite NYU Tandon School of Engineering Math and Computer Science courses (or similar courses offered by Courant). The minor requirements then comprise five security related courses. Students may count CS/EE courses in the minor as CS/EE electives in the BS degree programs in Computer Science and Computer Engineering.

Cybersecurity is focused on the technical aspects of security systems and geared for those who are enrolled in a technical program in Computer Science or related field. It covers at a detailed level technology that is used to detect security violations, technology that is used to build security appliances and technology that is used to secure applications. This minor is geared towards students who want to work in a technical field of security such as penetration testing or developing secure applications or who plan to go onto graduate education in security.

Applying for the Minor

Apply for a minor in Albert using the link in the My Academics section of the Student Center.

Students should apply for the minor before applying for graduation. After applying for the minor, the application is then forwarded to the Home School Advising Office, Host School Advising Office, Host School Department/Program, and the Academic Dean's office.

The departmental advisers governing the minor will have access to approve or disapprove the minor online using the Graduation Tracking Search page. If a student is registered for a course for the minor during their last semester, the adviser can still set the status to departmental approved pending current courses.

Program Requirements

The minor requires the completion of 15 credits, comprised of the following:

Course	Title	Credits
Required Courses		
CS-UY 3923	COMPUTER SECURITY	3
CS-UY 3933	NETWORK SECURITY	3
CS-UY 4753	Application Security	3
CS-UY 4793	Computer Networking	3
or ECE-UY 3613	Communication Networks	
Elective Course		
<i>NYU Tandon SOE Security Courses</i>		
Select one of the following:		3
CS-UY 4763	Information Systems Security Engineering and Management	
CS-UY 4773	Penetration Testing and Vulnerability Analysis	
CS-UY 4783	Applied Cryptography	
ECE-GY 9423	ST: COMP ELEC DEVICES & SYSTEM	
Total Credits		15

Note to CAS Students: Those who plan to take the cybersecurity minor should be aware that the minor will require them to take at least four courses (12 credits) at the NYU Tandon School of Engineering and that there is a limit (four courses or 16 credits) on the number of courses they may take outside of CAS. Thus, they must plan their programs carefully.

Minor Prerequisites

Students will be expected to complete a minimal core curriculum (knowledge of programming, data structures, discrete math, and some computer architecture) in the CS undergraduate program, before enrolling in this minor, in order to be well prepared for the security coursework. Students who would like to pursue this minor who are not also CS majors will have to complete these courses (or show equivalent mastery) in addition to the minor requirements. The typical pathway through the prerequisite chain for NYU Tandon School of Engineering students will include the following five courses:

CS-UY 1114 INTRO TO PROGRAMMING & PROBLEM SOLVING
 CS-UY 1134 Data Structures and Algorithms*
 CS-UY 2124 Object Oriented Programming*

***Note:** Students who entered NYU Tandon prior to FA16 may take CS-UY 1124 Object Oriented Programming and CS-UY 2134 Data Structures and Algorithms *instead of CS-UY 1134 and CS-UY 2124.*

MA-UY 2314 Discrete Mathematics
 CS-UY 2214 COMPUTER ARCHITECTURE AND ORGANIZATION

NYU Tandon School of Engineering Computer Science or Computer Engineering majors can take CS-UY 3224 INTRO TO OPERATING SYSTM as a co-requisite with CS-UY 3923 COMPUTER SECURITY.

Alternatively, students may satisfy most of the prerequisites with courses in the College of Arts and Sciences:

CSCI-UA 0002 or placement exam
 CSCI-UA.0101 (Introduction to Computer Science)
 CSCI-UA 0102 (Data Structures)
 CSCI-UA.0201 Computer Systems Organization)
 MATH-UA.0120 (Discrete Mathematics).

These prerequisites can be completed by the fourth or fifth semester, leaving 3-4 semesters to complete the minor. Some courses require other

security courses as prerequisites. Students should be sure to fulfill all necessary course requirements.

Suggested Sequence of Courses

CS-UY 3923 COMPUTER SECURITY can be taken at the same time as *Operating Systems* (5th semester of study for students entering CS BS program without advanced placement). Computer Security is a prerequisite for CS-UY 4753 Application Security. CS-UY 4793 Computer Networking can be taken as early as the 4th semester, once the student has completed Data Structures & Algorithms CS-UY 2134 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=17&poid=4987&returnto=1374#tt6086) and *Object-Oriented Programming* (CS-UY 2124 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=17&poid=4987&returnto=1374#tt9795)). *Computer Networking* is a prerequisite for *Network Security* (CS-UY 3933 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=17&poid=4987&returnto=1374#tt3109)), which, in turn, is a prerequisite for certain, more advanced electives. Students are advised to take these core courses during the junior year and/or first semester of the senior year, and then to take remaining security electives during the senior year.

CAS students who plan to take the cybersecurity minor should be aware that the minor will require them to take at least four courses (12 credits) at the NYU Tandon School of Engineering and that there is a limit (four courses or 16 credits) on the number of courses they may take outside of CAS. Thus, they must plan their programs carefully.

Policies

NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (<https://bulletins.nyu.edu/undergraduate/engineering/academic-policies/>).