

## **M.S. in Cybersecurity & Privacy (30 credits)**

### **Training Cybersecurity Experts**

In today's hyper-connected society, there is strong demand for **cybersecurity professionals** prepared to build and defend our networked infrastructure. With frequent data breaches exposing customer data for malicious intent, all sectors of industry and government are carefully examining their systems for vulnerabilities, and experts in this field are in demand as never before.

The M.S. in Cybersecurity and Privacy covers the construction and maintenance of secure software systems and tools to ensure the integrity of data and network communication. This spans topics from theoretical cryptographic protocols to government and corporate policy on data privacy. To be admitted to the program, we require a basic background in Mathematics (calculus, linear algebra), Statistics (probability and basic stats) and Software Development (programming, data structures and algorithms). A GRE score is not required. This part-time degree program involves 10 courses of 3 credits each, taught over 5 semesters of 15 weeks each (including summer). Courses consist of formal lectures as well as hands-on programming, network administration, and counter-hacking projects.

The curriculum focuses on various techniques for mitigating the risk of data breaches and unauthorized access to networked devices and systems. Participants will learn how to identify security vulnerabilities in local, networked, and cloud software systems, and develop rigorous data management and software development workflows. The program consists of 10 courses of 3 credits each, taught over 5 semesters of 15 weeks each. Instruction includes formal lectures as well as hands-on projects securely storing, transmitting, and extracting data.

The program curriculum covers tools and technologies such as OpenSSL, Wireshark, Rainbow tables, Blockchains, and Certificate Transparency. Students work on homework assignments and projects covering both theory and applications on real data with guidance from the professor and teaching assistants.

**Recommended part-time credit schedule:** Two courses (6 credits) per semester over five consecutive semesters, including Summer. Start is possible in Fall, Spring or Summer semesters.

#### **Core (required) courses:**

CS 608	Cryptography and Privacy
CS 645	Security and Privacy in Computer Systems
CS 646	Network Protocols Security
CS 647	Counter Hacking Techniques
CS 656	Internet and Higher Layer Protocols
CS 696	Network Management and Security

#### **Sample electives:**

CS 610	Data Structures and Algorithms
CS 630	Operating Systems Design
CS 631	Data Management System Design
CS 634	Data Mining
CS 643	Cloud Computing
CS 673	Software Design and Production Methodology
CS 684	Linux Kernel Programming
IS 680	Information Systems Auditing
IS 681	Computer Security Auditing
IS 682	Forensic Auditing for Computer Security
IT 620	Wireless Networks Security and Administration
IT 640	Network Services Administration

**Prerequisites and Admissions:**

To be eligible for admission, a student must have a B.S. degree with a minimum GPA of 2.8 on a 4.0 scale and have the following background (typically obtained through a BS in a STEM field):

- Calculus: Derivatives, integrals, applications
- Linear Algebra: Vector spaces, dot products, matrices, linear systems
- Probability and Statistics: Random variables, probability distributions, basic statistics
- Programming: Basic programming constructs, writing and debugging programs, iteration, recursion, arrays, lists
- Data Structures and Algorithms: Basic data structures, search and sort, algorithm analysis

Applicants lacking this background may enroll in the Certificate in Foundations of Cybersecurity to acquire it and then continue to the MS program while transferring all credit.

***A GRE score is not required.***

**Program Outcomes:**

- Design and build secure infrastructure for managing data and communication both in the cloud and on local servers.
- Provide expert insight on security standards and protocols in large-scale software development or data analytics projects.
- Play a key role in performing ad-hoc analyses of data stored in corporate or government databases and propose solutions to potential vulnerabilities.
- Serve as a network administrator, using penetration testing and other ethical hacking techniques to harden the system against attack.

**Tuition + fees for ALL non-F1 students (independent of residency and visa status) at 2020-21 rates, assuming two courses per consecutive semester:**

**Fall semester: \$6,522. Spring semester: \$6,522. Summer semester: \$5,577.**

**Total tuition + fees for degree: Fall start: \$31,665. Spring start: \$30,720. Summer start: \$30,720.**

**For more information, contact Tim Hart, ph: (973) 596-2911, (862) 234-5706, [hart@njit.edu](mailto:hart@njit.edu), or visit <https://jerseycity.njit.edu>**