



NJIT@JerseyCity

M.S. in Computer Science

M.S. in Computer Science (30 credits) Training Computing Professionals

Everything runs on software – from smart phones to autonomous cars to the refrigerator in your kitchen.

Today's software-driven society depends on **computing professionals** to both build and maintain that software, develop new features, and keep our data and livelihoods secure. As recent global events have shown, our world can only move as quickly and efficiently as the computer systems that power it.

The M.S. in Computer Science prepares its graduates for all areas of this critical field, whether it's maintaining legacy systems or designing the newest smartphone apps and virtual reality applications. Students develop an understanding of the theories underpinning effective software design, as well as the algorithms that allow our computers to solve some of the most difficult problems in human history. 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 three credits each, (four core courses and six electives), typically taught over five semesters of 15 weeks each (**including summer**). Courses consist of formal lectures and as hands-on programming projects.

The program curriculum uses programming languages to put key concepts into practice while building *reliable* and *scalable* software systems. Participants will be responsible for both making the software work and understanding **how** and **why** it works. Students complete hands-on homework assignments and projects covering both theory and applications with guidance from the professor and teaching assistants.

Recommended part-time credit schedule:

Two courses (**six credits**) per semester over five consecutive semesters, including Summer. Start is possible in Fall, Spring or Summer semesters.

Core (required) courses:

- CS 610 Data Structures and Algorithms
- CS 630 Operating System Design
- CS 631 Data Management System Design
- CS 656 Internet and Higher Layer Protocols

Sample electives:

- CS 602 Java Programming
- CS 632 Advanced Database System Design
- CS 634 Data Mining
- CS 636 Data Analytics with R Programming
- CS 643 Cloud Computing
- CS 644 Introduction to Big Data
- CS 670 Artificial Intelligence
- CS 673 Software Design and Production Methodology
- CS 675 Machine Learning
- CS 677 Deep Learning
- CS 684 Software Testing and Quality Assurance
- CS 696 Network Management and Security

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 B.S. 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 Computer Science, Certificate in Foundations of Cybersecurity or Certificate in Big Data Essentials to acquire it and then continue to the M.S. program while transferring all credits, if they maintain a minimum GPA of 3.0 in the certificate program.

A GRE score is not required.

Program Outcomes:

- Assess the efficiency of a given computer algorithm and identify common logic errors in software design, while designing new data structures and algorithms for new use cases.
- Create reliable and scalable software systems for real world applications in a variety of environments on a variety of devices.
- Build a robust and secure database system – from design to implementation – for a wide range of purposes.
- Construct networked applications that can quickly and safely transmit and process data, taking advantage of parallel and cloud computing.
- Develop a specialized skillset in one of several high demand areas of computing, including data science, cybersecurity and software engineering.



For more information and to apply, contact:

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