APPLIED URBAN SCIENCE AND INFORMATICS (MS)

Center for Urban Science and Progress (https://engineering.nyu.edu/research-innovation/centers/cusp/)

NYSED: 35795 **HEGIS:** 0799.00 **CIP:** 11.0104

Program Description

The Applied Urban Science and Informatics MS offered by NYU's Center for Urban Science and Progress (CUSP) (https://engineering.nyu.edu/center-urban-science-and-progress-cusp/) provides students with the opportunity to engage in the interdisciplinary study of urban science and informatics and apply technical skills to urban problems. The two-year, 36-credit MS program provides core courses in urban science, urban informatics, and information and communication technology in cities. Students will have the opportunity to select from multiple urban domains and informatics disciplines to gain breadth and depth in the application of big data analytics to urban problems.

Admissions

To apply for admission to any Tandon graduate program, please contact the Office of Graduate Admissions (https://engineering.nyu.edu/admissions/graduate/).

Program Requirements

The program requires the completion of 36 credits, comprised of the following:

Course	Title	Credits
Core Requirements		
Lab		
CUSP-GX 7000	Data Governance, Ethics, and Privacy	0
Data Science Methodologies		
CUSP-GX 7013	Introduction to Applied Data Science	3
CUSP-GX 7023	Applied Data Science	3
CUSP-GX 7033	Machine Learning for Cities	3
Urban Science and Policy Methodologies		
Select one of the following: [1]		3
CUSP-GX 7043	Civic Analytics	
CUSP-GX 7053	Innovative City Governance	
Capstone Project		
CUSP-GX 7103	Capstone Urban Science Intensive I: Project Management	3
CUSP-GX 7113	Capstone Urban Science Intensive II: Data Analysis and Communications	3
Electives		
Select courses from the Electives section below.		18
Total Credits		**36**

[1] If students take both Civic Analytics (CUSP-GX 7043) and Innovative City Governance (CUSP-GX 7053) one will count as an elective.

Electives

Students can customize their education with 18 credits of CUSP electives. CUSP has organized them into **Knowledge Tracks** below to help students align electives with their career goals. These overlapping tracks are only intended as a guide; students are not required to choose electives associated with the listed tracks exclusively.

As part of their 18 electives, students may take up to 6 credits of non-CUSP courses from any NYU School except the School of Professional Studies upon approval from the CUSP Education Team.

Knowledge Tracks

The lists of electives below is not comprehensive—it reflects the latest offerings, with new elective courses introduced regularly. Students may take 18 credits of elective offerings throughout the MS program from the list below, which may be updated occasionally.

Artificial Intelligence (AI)

This track focuses on mastering AI and machine learning techniques to address urban challenges and create more efficient, equitable, and resilient cities.

Course	Title	Credits
CUSP-GX 8093	Data Visualization	3
CUSP-GX 8843	Virtual and Augmented Reality	3
CUSP-GX 8863	From Correlation to Causation: Data Science for Decision Making	3
CUSP-GX 8873	Urban Computing and Artificial Intelligence	3
MG-GY 8813	Design for Innovation with AI & ML	3

Complex Systems

This track focuses on modeling urban environments to assess climate risks, optimize transportation infrastructure, and analyze complex city-scale interactions for sustainable, resilient urban planning.

Course	Title	Credits
CUSP-GX 8043	Advanced Spatial Analytics	3
CUSP-GX 8053	Urban Decision Models	3
CUSP-GX 8123	Climate Risk Analysis and Urban Sustainability	3
CUSP-GX 8153	Complex Urban Systems	3
CUSP-GX 8863	From Correlation to Causation: Data Science for Decision Making	3
CUSP-GX 8883	Urban Transportation & Logistics Systems	3

Geographic Information Systems (GIS)

This track focuses on spatializing and visualizing data using advanced mapping technologies to support decision-making on urban issues.

Course	Title	Credits
CUSP-GX 5053	Geographic Information Systems	3
CUSP-GX 8033	Urban Spatial Analytics	3
CUSP-GX 8043	Advanced Spatial Analytics	3
CUSP-GX 8093	Data Visualization	3
CUSP-GX 8103	Data-Driven Methods for Policy Evaluation	3
CUSP-GX 8113	Monitoring Cities	3
CUSP-GX 8853	Understanding Urban Subsurfaces: Identifying, Integrating, & Operationalizing Relevant Data Streams	3

Policy Analytics

This track focuses on the intersection of data, technology, and urban policy. It explores how data drives transformation by supporting land use planning, transportation, housing, and sustainability policies. It emphasizes the role of civic technology in empowering citizens through smart cities, open data, and digital tools.

Course	Title	Credits
CUSP-GX 5053	Geographic Information Systems	3
CUSP-GX 7043	Civic Analytics	3
CUSP-GX 7053	Innovative City Governance	3
CUSP-GX 8053	Urban Decision Models	3
CUSP-GX 8103	Data-Driven Methods for Policy Evaluation	3
CUSP-GX 8133	The Citizen and The City	3
CUSP-GX 8823	Digital Civics for Social Innovation	3
CUSP-GX 8833	City Immersion	3

Smart Infrastructure

This track focuses on developing and implementing smart city infrastructure and emerging technologies' role in improving city services and residents' quality of life.

Course	Title	Credits
CUSP-GX 8063	Urban Sensing	3
CUSP-GX 8083	Big Data Management & Analysis	3
CUSP-GX 8113	Monitoring Cities	3
CUSP-GX 8143	Internet-of-Things Security and Privacy: A Data-Driven Perspective	3
CUSP-GX 8823	Digital Civics for Social Innovation	3
CUSP-GX 8833	City Immersion	3
CUSP-GX 8843	Virtual and Augmented Reality	3
CUSP-GX 8883	Urban Transportation & Logistics Systems	3

Sustainability

This track focuses on using data to assess climate risks and guide cities in adapting to environmental changes for long-term sustainability and resilience.

Course	Title	Credits
CUSP-GX 8033	Urban Spatial Analytics	3
CUSP-GX 8063	Urban Sensing	3
CUSP-GX 8123	Climate Risk Analysis and Urban Sustainability	3
CUSP-GX 8153	Complex Urban Systems	3

Urban Technology Management

This track explores how entrepreneurship in emerging technologies can transform cities, envisioning new governance, infrastructure, and planning tools.

Course	Title	Credits
CUSP		
CUSP-GX 7043	Civic Analytics	3
CUSP-GX 7053	Innovative City Governance	3
CUSP-GX 8083	Big Data Management & Analysis	3
CUSP-GX 8133	The Citizen and The City	3
CUSP-GX 8823	Digital Civics for Social Innovation	3
CUSP-GX 8863	From Correlation to Causation: Data Science for Decision Making	3
CUSP-GX 8873	Urban Computing and Artificial Intelligence	3
CUSP & Management of Technology (MOT)		
MG-GY 7703	Entrepreneurship	3
MG-GY 8203	Project Management	3
MG-GY 8673	Technology Strategy	3
MG-GY 8813	Design for Innovation with AI & ML	3
MG-GY 9013	Design Thinking for Creative Problem Solving	3

Internships

The Center for Urban Science + Progress (https://engineering.nyu.edu/research-innovation/centers/cusp/) (CUSP) at NYU Tandon offers a distinctive Internship-for-Credit program, enabling full-time graduate students to apply interdisciplinary skills in real-world environments. This supervised program integrates fieldwork with academic learning, equipping students to tackle relevant challenges while gaining valuable industry experience. Students are responsible for securing an eligible internship and obtaining adviser approval, as CUSP does not place students directly.

Upon completion, students submit comprehensive reports reflecting on their contributions and insights, deepening their understanding and enhancing their career prospects. This opportunity enriches their academic journey and propels them towards impactful careers.

Capstone Project

During the 6-credit, two-semester Urban Science Intensive I and II courses, students collaborate in a multidisciplinary environment with sponsors from city agencies, private companies, startups, or academic institutions to address pressing urban challenges in transit, public health, and sustainability. Students play a key role in leveraging data to drive meaningful change in the city.

Capstone Urban Science Intensive I: Project Management (CUSP-GX 7103) marks the initial stage of this sequence. During this phase, students are immersed in a real-world, off-campus work environment where they work in teams to define the scope of their projects. This course emphasizes developing essential project management skills, including problem identification, stakeholder engagement, timeline management, and team coordination. Students focus on creating actionable plans and establishing effective communication strategies with project stakeholders. By the end of the semester, the goal is for students to develop a comprehensive project plan as the foundation for the subsequent course.

Building upon the groundwork established in the first course, **Capstone Urban Science Intensive II: Data Analysis and Communications (CUSP-GX 7113)** focuses on applying advanced data science techniques to refine solutions to the identified urban challenge. In this phase, students engage in data collection, analysis, and visualization tasks to generate actionable insights. The final capstone course strongly emphasizes the communication of complex data, as students are expected to present their findings and proposed solutions through a professional client presentation and a poster showcase. This final step in the capstone sequence ensures that students can effectively convey the impact and practicality of their solutions in real-world applications.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CUSP-GX 7000	Data Governance, Ethics, and Privacy (Required)	0

CUSP-GX 7013	Introduction to Applied Data Science	3
CUSP-GX 8000	Foundations in Policy, Research, and Writing (Optional)	0
Urban Science and Policy Methodologies		3
Elective		3
	Credits	**9**
2nd Semester/Term		
CUSP-GX 7023	Applied Data Science	3
CUSP-GX 7033	Machine Learning for Cities	3
Elective		3
	Credits	**9**
3rd Semester/Term		
CUSP-GX 7103	Capstone Urban Science Intensive I: Project Management	3
Elective		3
Elective		3
	Credits	**9**
4th Semester/Term		
CUSP-GX 7113	Capstone Urban Science Intensive II: Data Analysis and Communications	3
Elective		3
Elective		3
	Credits	**9**
	Total Credits	**36**

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Identify and analyze urban issues with a focus on communication, innovation and solution building.
2. Develop the technical skills to analyze data and communicate findings.
3. Understand and communicate for decision making at the city and policy making level.
4. Engage, support or contribute to the development of applied research in the service of cities and public good.

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/graduate/engineering/academic-policies/).