URBAN SYSTEMS (PHD)

NYSED: 41225 **HEGIS:** 0206.00 **CIP:** 30.0601

Program Description

The NYU Doctoral program in Urban Systems offers an interdisciplinary learning and research environment designed to meet the needs of students pursuing careers in academia, research organizations, local and national government and public service agencies. This Ph.D. program expands upon the unique legacy of decades of collaboration in education and research, development and training between NYU faculty, city agencies, and industry. The program is administered by NYU Tandon in partnership with other NYU schools including: the Stern School of Business (https://www.stern.nyu.edu/), Langone Health (https://med.nyu.edu/), Wagner Graduate School of Public Service (https://wagner.nyu.edu/), and NYU research centers including the Center for Urban Science and Progress (https://cusp.nyu.edu/) and the Center for Connected Mobility C2SMART (https://engineering.nyu.edu/research-innovation/centers/connected-cities-smart-transportation-c2smart/).

This program is aligned with the vision and commitment of the university to work within the 'city as a lab' to accelerate the field deployment of innovative solutions to emerging urban needs. Areas of study include sustainability and climate action, infrastructure and resilience, public health and equity. This interdisciplinary laboratory of urban research and innovation brings together expertise and the research excellence of NYU faculty in New York as well as our global campuses in Abu Dhabi and Shanghai, and study abroad sites in London, Paris, Berlin, Madrid, Florence, and Prague. Drawing from the expertise of the Urban Faculty (https://www.nyu.edu/academics/scholarly-strengths/urban-initiative/research/faculty.html) across the university, we have built a unique and competitive interdisciplinary educational environment based on the following disciplinary pillars:

- Data Science & Informatics
- Communication and Information Science
- Social Studies, Health, and Policy
- Systems Engineering
- Economics, Finance, and Planning

The program is available to students with diverse educational backgrounds pursuing their studies across disciplines, including Engineering, Environmental Science, Architecture, Urban Planning, Computing, Data Science, Systems Science, Economics, Finance, Public Health, Public Policy, and Law. Development of skills in mathematics, statistics, and programming is included in the course of study, depending on the need associated with the student's dissertation topic.

Admissions

Admission to graduate programs in the Tandon School of Engineering requires the following minimum components:

- Résumé/CV
- Statement of Purpose
- Letters of Recommendation
- Transcripts
- Proficiency in English

The NYU Tandon Graduate Admissions website (https://engineering.nyu.edu/admissions/graduate/apply/requirements/) has additional information on school-wide admission.

Some programs may require additional components for admissions.

See the program's How to Apply (https://engineering.nyu.edu/admissions/graduate/how-apply/) for department-specific admission requirements and instructions.

Application Requirements

1. Master's or Bachelor's degree from an accredited program in physical and mathematical sciences, social sciences, or engineering (other fields upon approval of program administrator).
2. Minimum Master's and Bachelor's degree GPA of 3.5/4.0, and 3.0/4.0, respectively.
3. Submission of GRE, and English language proficiency test scores (when applicable).

An applicant who has not yet earned a master's degree may be directly admitted into the Ph.D. program with the written approval of the program director. Applicants with a master's degree in any discipline other than Master of Science may be required to have prerequisites in the subjects listed below:

- Calculus with analytic geometry
- Statistics and Probability
- Introduction to computer programming

In addition to these degree requirements and the NYU Tandon general admission requirements (https://engineering.nyu.edu/admissions/graduate/apply/requirements/), acceptance to the program will depend on:

1. academic excellence,
2. research interests congruent with areas of urban scholarship and faculty research at NYU including the global campuses, and
3. positive recommendations (e.g., from former employers or research advisors).

Note: Application and/or admission to the program does not require prior identification of a research advisor. Acceptance to the program is not automatically accompanied with financial support.

Program Requirements

Course	Title	Credits
Major Requirements		
Core Courses		
CE-GY 7843	Urban Infrastructure Systems Management	3
CE-GY 6053	MONITORING CITIES	3
CUSP-GX 7013	Introduction to Applied Data Science	3
Major Core		
CE-GY 7815	URBAN SYSTEMS STUDIO	1.5
CE-GY 7915		1.5
or CP-GY 9941	Internship for PhD I	
Dissertation Courses		
CE-GY 998X	DISSERTATION LEVEL RESEARCH	6
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT (this course is taken 5 times, for a total of 15 credits)	15

Electives	
Urban Systems Electives	9
Other Elective Credits	33
Total Credits	**75**

Additional Program Requirements

Qualifying Exam

Students must successfully complete a qualifying examination. The qualifying examination has a written section and an oral section. The written exam is based on the program's three core courses, while the oral exam is designed to judge the students' critical thinking.

The qualifying exam is administered only once, regularly scheduled at the end of spring semester of the first year of the program.

Dissertation Proposal Exam

Students must successfully pass the dissertation proposal exam. This exam should be administered on or before the spring midterm of year two of the program, and signed off by the dissertation/guidance committee and submitted for the record within a week of the exam. Meeting this deadline is a requirement of the program.

Dissertation Defense

Students must complete and successfully defend 21-credits of dissertation. Dissertations must consist of original research that advances the state of the art in the research subject area and should result in the publication of at least three papers in a peer-reviewed journal (2 published by time of defense, another under review). It is expected that the student is the first author; it is also encouraged to engage the dissertation guidance committee members to the extent that they may be justified as co-authors.

PhD Dissertation Submission

Students must submit the Ph.D. dissertation following the University's Guidelines for Dissertations (http://phdhub.engineering.nyu.edu/pdf/phd-dissertation-guidelines.pdf). It is encouraged that the student's publication be planned in advance such that they may be used as the backbone of the dissertation content.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CE-GY 6053	MONITORING CITIES	3
CE-GY 7815	URBAN SYSTEMS STUDIO	1.5
CE-GY 7843	Urban Infrastructure Systems Management	3
CUSP-GX 7013	Introduction to Applied Data Science	3
	Credits	**10.5**
2nd Semester/Term		
RE-GY 9990	PHD QUALIFYING EXAM	0
Elective		3
Elective		3
Elective		3
	Credits	**9**
3rd Semester/Term		
CE-GY 7915	[1]	1.5
Elective		3
Elective		3
Elective		3
	Credits	**10.5**
4th Semester/Term		
Elective		3
Elective		3
Elective		3
	Credits	**9**
5th Semester/Term		
Elective		3
Elective		3
Elective		3
	Credits	**9**
6th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Elective		3
	Credits	**6**
7th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Elective		3
	Credits	**6**
8th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
	Credits	**3**
9th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
	Credits	**3**
10th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
	Credits	**3**
11th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
	Credits	**3**
12th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
	Credits	**3**
	Total Credits	**75**

[1]

Should be taken in the 2nd or 3rd year, and after passing RE-GY 9990.

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Have an understanding of urban infrastructure system governance and operations management.
2. Be skilled on how to integrate artificial intelligence and data analytics for infrastructure operations and performance monitoring.
3. Be able to teach design, system planning, and engineering for resilience, including infrastructure finance and economics.
4. Be able to teach how to identify and assess challenges relevant to urban infrastructure systems and apply appropriate engineering and analytics methods to advance the state of the field.

Policies

Interruptions in the Course of Study

Given unforeseen circumstances that warrants an interruption in the course of study, the student may request a leave of absence, term withdrawal, or total withdrawal. Further information on leave of absence may be found **here**.

Application for Graduation

Students should apply for graduation via NYU Albert. The application must be completed before the deadline set by the Registrar's office, which can be found on the NYU Academic Calendar.

For further information, contact the Urban Systems Ph.D. Program Director
Masoud Ghandehari, Ph.D. (https://engineering.nyu.edu/faculty/masoud-ghandehari/)
masoud@nyu.edu

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/).