Urban Informatics, MS (Boston)

The Master of Science in Urban Informatics (MSUI) degree couples comprehensive data analytics skills with an understanding of the big questions faced by cities in the 21st-century city. This cutting-edge program is built upon a unique cross-college initiative, which offers comprehensive state-of-the-art training in the core skills of data analytics—including quantitative analysis, data mining, machine learning, and data visualization. Urban informatics students supplement training in these foundational skills with a specialized sequence of courses that address how data and technology are being used to tackle key social, infrastructural, and environmental challenges.

By combining a theoretically informed perspective of cities with advanced skills in accessing, managing, analyzing, and communicating insights from large complex, datasets, graduates are a part of the next wave of urban professionals ready to lead in the public, private, and nonprofit sectors. Given the continuous growth in urban data and technology, these professionals are essential to shaping the future of urban areas around the globe.

This program provides a uniquely integrated urban and informatics degree with a substantial experiential education component. The focus throughout is on practical application, and students have multiple opportunities to apply what they are learning.

The master's program offers an optional cooperative education experience (co-op) to eligible students. Co-op education is central to both the Northeastern experience and to the College of Social Sciences and Humanities experiential liberal arts framework. Northeastern's signature co-op ecosystem provides qualified master's students with six-month work experiences in businesses, nonprofits, and government agencies in Boston and across the United States. Graduate students take their work from campus learning spaces, apply their knowledge outside of the classroom, and then bring knowledge and skills gained in community learning spaces back to our campus learning spaces during the cocurricular experiential integration course.

Please review the tuition and fee (https://catalog.northeastern.edu/graduate/expenses/) page as credit costs differ depending on the college in which the course resides.

Climate and Resilience Concentration

This graduate concentration is available to students in the MSUI who want to specialize in the policy challenges that arise from climate change and the methodological tools designed to respond to them, especially those that help us understand and instill resilience in communities that are vulnerable to disruption. The concentration is comprised of three courses: a methods and applications course specific to the concentration; an analysis course specific to the concentration; and the requirement to complete a capstone or practicum relevant to climate and resilience.

Communities and Economic Development Concentration

This graduate concentration is available to students in the MSUI who want to specialize in the policy challenges associated with neighborhoods and communities and the methodological tools for addressing them. This includes examining more closely how communities work and the types of interventions that can help them to thrive and prosper. The concentration is comprised of three courses: a methods and applications course specific to the concentration; an analysis course specific to the concentration; and the requirement to complete a capstone or practicum relevant to communities and economic development.

Transportation and Infrastructure Concentration

This graduate concentration is available to students in the MSUI who want to specialize in the policy challenges and methods associated with transportation and related infrastructure. This includes questions of policy and operations pertaining to traffic management and public transit and the skills for analyzing mobility decisions. The concentration is comprised of three courses: a methods and applications course specific to the concentration; an analysis course specific to the concentration; and the requirement to complete a capstone or practicum relevant to transportation or infrastructure.

CSSH Graduate Programs General Regulations (https://catalog.northeastern.edu/graduate/social-sciences-humanities/general-regulations/)

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
Data Science Courses		
DA 5020	Collecting, Storing, and Retrieving Data	4
or DA 5030	Introduction to Data Mining/Machine Learning	
or PPUA 7237	Advanced Spatial Analysis of Urban Systems	

INSH 5301	Introduction to Computational Statistics	4
INSH 5302	Information Design and Visual Analytics	4
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	4
Methods and Applications		
PPUA 5262	Big Data for Cities	4

Concentrations or Electives Option

A concentration is not required. Students may complete electives option in lieu of a concentration.

- Climate and Resilience (p. 2)
- Communities and Economic Development (p. 2)
- Transportation and Infrastructure (p. 3)
- Electives Option (p. 3)

Optional Co-op Experience

Code	Title	Hours
Four-month co-ops require registration at 1 SH for one term. Longer co-ops require registration at 1 SH per term for two consecutive terms:		1-2
PPUA 6964 and INSH 6864	Co-op Work Experience and Experiential Integration	

Program Credit/GPA Requirements

33 total semester hours required (34-35 with optional co-op)

Minimum 3.000 GPA required

CONCENTRATION IN CLIMATE AND RESILIENCE

Code	Title	Hours
Methods and Applications		
Complete 4 semester hours from the following:		4
PPUA 5246	Participatory Modeling for Collaborative Decision Making	
PPUA 5260	Ecological Economics	
PPUA 5264	Energy Democracy and Climate Justice: Technology, Policy, and Social Change	
PPUA 5268	International Environmental Policy	
PPUA 6101	Environmental Science and Policy Seminar 1	
PPUA 7346	Resilient Cities	
Analysis		
Complete 4 semester hours from the following:		4
INSH 6101	Agent-Based Modeling for Applied and Social Sciences	
INSH 6302	Qualitative Methods	
POLS 7334	Social Networks	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
CIVE 7000-level Special Topics in Engineering—approved by program director		
Practicum or Capstone		
Complete topic-focused capstone or practicum approved by program director:		4
PPUA 6966	Practicum	
or PPUA 7673	Capstone in Public Policy and Urban Affairs	
Portfolio		
PPUA 6410	Urban Informatics Portfolio	1

CONCENTRATION IN COMMUNITIES AND ECONOMIC DEVELOPMENT

Code	Title	Hours
Methods and Applications		
Complete 4 semester hours from the following:		4
IE 7374	Special Topics in Industrial Engineering (Sharing Economy Systems)	
PPUA 5230	Housing Policy	

PPUA 5235	Participatory Community Planning Methods	
PPUA 5246	Participatory Modeling for Collaborative Decision Making	
PPUA 5265	Global Urbanization and Planning	
PPUA 6502	Economic Analysis for Policy and Planning	
PPUA 6552	The Nonprofit Sector in Civil Society and Public Affairs	
Analysis		
Complete 4 semester hours from the following:		4
INSH 6101	Agent-Based Modeling for Applied and Social Sciences	
INSH 6302	Qualitative Methods	
INSH 6406	Analyzing Complex Digitized Data	
POLS 7334	Social Networks	
PPUA 6509	Techniques of Program Evaluation	
Practicum or Capstone		
Complete topic-focused capstone or practicum approved by program director:		4
PPUA 6966	Practicum	
or PPUA 7673	Capstone in Public Policy and Urban Affairs	
Portfolio		
PPUA 6410	Urban Informatics Portfolio	1

CONCENTRATION IN TRANSPORTATION AND INFRASTRUCTURE

Code	Title	Hours
Methods and Applications		
Complete one of the following:		4
IE 7374	Special Topics in Industrial Engineering (Sharing Economy Systems)	
PPUA 5246	Participatory Modeling for Collaborative Decision Making	
PPUA 7346	Resilient Cities	
Analysis		
Complete 4 semester hours from the following:		4
CIVE 7110	Critical Infrastructure Resilience	
CIVE 7380	Performance Models and Simulation of Transportation Networks	
CIVE 7381	Transportation Demand Forecasting and Model Estimation	
INSH 6101	Agent-Based Modeling for Applied and Social Sciences	
CIVE 7000-level Special Topics in Engineering—approved by program director		
Practicum or Capstone		
Complete topic-focused capstone or practicum approved by program director:		4
PPUA 6966	Practicum	
or PPUA 7673	Capstone in Public Policy and Urban Affairs	
Portfolio		
PPUA 6410	Urban Informatics Portfolio	1

ELECTIVES OPTION

Code	Title	Hours
Methods and Applications		
PPUA 5266	Urban Theory and Science	4
Analysis		
Complete 4 semester hours from the following:		4
INSH 6101	Agent-Based Modeling for Applied and Social Sciences	
INSH 6406	Analyzing Complex Digitized Data	
POLS 7334	Social Networks	
PPUA 5246	Participatory Modeling for Collaborative Decision Making	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 6212	Research Toolkit for Urban and Regional Policy: Project Management	
PPUA 6216	Research Toolkit for Urban and Regional Policy: Grant Writing	
Practicum or Capstone		
PPUA 6966	Practicum	4

or PPUA 7673	Capstone in Public Policy and Urban Affairs	
Portfolio		
PPUA 6410	Urban Informatics Portfolio	1