

Urban Informatics, MS

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, data sets, 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. Cooperative 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://studentfinance.northeastern.edu/billing-payments/tuition-and-fees/>) 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 Master of Urban Informatics (MSUI). It is designed for MSUI students 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 method and application 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 Master of Urban Informatics (MSUI). It is designed for MSUI students 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 method and application 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 Master of Urban Informatics (MSUI). It is designed for MSUI students 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 method and application 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 (<http://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

- No concentration (p. 1)
- Climate and Resilience (p. 2)
- Communities and Economic Development (p. 2)
- Transportation and Infrastructure (p. 2)

No Concentration

Code	Title	Hours
Methods and Applications		
PPUA 5266	Urban Theory and Science	4

Analysis

Complete 4 semester hours from the following:	4
INSH 6406 Analyzing Complex Digitized Data	
POLS 7334 Social Networks	
PPUA 5261 Dynamic Modeling for Environmental Decision Making	
PPUA 6212 Research Toolkit for Urban and Regional Policy: Project Management (2 semester hours)	
PPUA 6213 Research Toolkit for Urban and Regional Policy: Data Visualization (2 semester hours)	
PPUA 6216 Research Toolkit for Urban and Regional Policy: Grant Writing (2 semester hours)	

Practicum or Capstone

PPUA 6966 Practicum	4
or PPUA 7673 Capstone in Public Policy and Urban Affairs	

Portfolio

PPUA 6410 Urban Informatics Portfolio	1
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Climate and Resilience Concentration

Code	Title	Hours
Method and Application		
Complete 4 semester hours from the following:		4
PPUA 5260 Ecological Economics		
PPUA 5264 Energy Democracy and Climate Resilience: 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 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
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Communities and Economic Development Concentration

Code	Title	Hours
Method and Application		
Complete 4 semester hours from the following:		4
CRIM 6270 Crime and Community Context		
IE 7374 Special Topics in Industrial Engineering (Sharing Economy Systems)		

PPUA 5230 Housing Policy	
PPUA 5265 Urban and Regional Policy in Developing Countries	
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 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

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Transportation and Infrastructure Concentration

Code	Title	Hours
Method and Application		
Complete one of the following:		4
IE 7374 Special Topics in Industrial Engineering (Sharing Economy Systems)		
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	
NETS 7350 Bayesian and Network Statistics	
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
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Optional Co-op Experience

Code	Title	Hours
Requires two consecutive semesters of Co-op Work Experience and Experiential Integration:		
PPUA 6964 and INSH 6864	Co-op Work Experience and Experiential Integration	2

Program Credit/GPA Requirements

33 total semester hours required (35 with optional co-op)
Minimum 3.000 GPA required