URBAN STUDIES AND PLANNING

Course 11, 11-6

Department Contact

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Description of Course 11

Those students who choose to major in the Department earn a Bachelor of Science in Planning (SB), an interdisciplinary pre-professional major designed to prepare students for careers in both the public and private sectors. A course 11 degree provides a sound foundation for students intending to do graduate work in law, public policy, economic development, urban design, management, and planning. The courses in the major teach students how the tools of economics, policy analysis, political science, and urban design can be used to solve social and environmental problems in the United States and abroad. In addition, students learn the skills and responsibilities of planners who seek to promote effective and equitable social change.

Description of Course 11-6

Those students who choose the joint major with the Department of Electrical Engineering and Computer Science will earn a Bachelor of Urban Science and Planning with Computer Science (SB), a major integrating social and technical skills with theoretical foundations and applied experience, designed to prepare students for careers in both the public and private sectors. The major provides a foundation for students intending to do graduate work in applied data analytics, public policy, economic development, urban design, management, and planning. In addition, students will participate in an applied urban science synthesis lab, where high-tech tools will be brought together to solve real-world problems.

The courses in the major teach students how the tools of ethics and justice, statistics, data science, geospatial analysis, visualization, robotics, and machine learning can be applied to craft solutions to complex problems that require new strategies, technologies, types of data, and approaches to science. Students will also learn the skills and responsibilities of planners who seek to promote effective and equitable social change.

The Department of Urban Studies and Planning and the Department of Electrical Engineering and Computer Science offer a diverse range of possibilities for creating a major tailored to your needs and interests in the following categories: Urban planning and policy; Statistics, data science, geospatial analysis and visualization; Computer science and machine learning; Integrated, hand-on experience working with data and new technologies to address real urban problems.

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Introductory Classes

* Indicates a class for course 11

^ Indicates a class for course 11-6

11.001[J]*^ **Introduction to Urban Design and Development**
Examines the evolving structure of cities and the way that cities, suburbs, and metropolitan areas can be designed and developed. Surveys the ideas of a wide range of people who have addressed urban problems. Stresses the connection between values and design. Demonstrates how physical, social, political and economic forces interact to shape and reshape cities over time. Introduces links between urban design and urban science.

11.002[J]*^ **Making Public Policy**
Examines how the struggle among competing advocates shapes the outputs of government. Considers how conditions become problems for the government to solve, why some political arguments are more persuasive than others, why some policy tools are preferred over others, and whether policies achieve their goals. Investigates the interactions among elected officials, think tanks, interest groups, the media, and the public in controversies over global warming, urban sprawl, Social Security, health care, education, and other issues.

11.003[J]* **Methods of Policy Analysis**
Provides students with an introduction to public policy analysis. Examines various approaches to policy analysis by considering the concepts, tools, and methods used in economics, political science, and other disciplines. Students apply and critique these approaches through case studies of current public policy problems.

11.005* **Introduction to International Development**
Introduces the political economy of international economic development planning, using an applied, quantitative approach. Considers why some countries are able to develop faster than others. Presents major theories and models of development and underdevelopment, providing tools to understand the mechanisms and processes behind economic growth and broader notions of progress. Offers an alternative view of development, focusing on the persistence of dichotomies in current theory and practice. Using specific cases, explores how different combinations of actors and institutions at various scales may promote or inhibit economic development. Students re-examine conventional

knowledge and engage critically with the assumptions behind current thinking and policy.

11.007*^ **Urban and Environmental Technology Implementation Lab**
Real-world clients and environmental problems form the basis of a project in which teams of students develop strategies for analysis and implementation of new sensor technology within cities. Working closely with a partner or client based on the MIT campus or in Cambridge, students assess the environmental problem, implement prototypes, and recommend promising solutions to the client for implementation. Equipment and working space provided. Limited to 12.

11.008*^ **Undergraduate Planning Seminar**
A weekly seminar that includes discussions on topics in cities and urban planning, including guest lectures from DUSP faculty and practicing planners. Topics include urban science, zoning, architecture and urban design, urban sociology, politics and public policy, transportation and mobility, democratic governance, civil rights and social justice, urban economics, affordable housing, environmental policy and planning, real estate and economic development, agriculture and food policy, public health, and international development. Weekly student presentations on local planning issues and current events; occasional walking tours or arranged field trips. May be repeated for credit.

11.011*^ **The Art and Science of Negotiation**
Introduction to negotiation theory and practice. Applications in government, business, and nonprofit settings are examined. Combines a "hands-on" personal skill-building orientation with a look at pertinent tactical and strategic foundations. Preparation insights, persuasion tools, ethical benchmarks, and institutional influences are examined as they shape our ability to analyze problems, negotiate agreements, and resolve disputes in social, organizational, and political circumstances characterized by interdependent interests. Enrollment limited by lottery; consult class website for information and deadlines.

11.013[J]* **American Urban History**
Seminar on the history of institutions and institutional change in American cities from roughly 1850 to the present. Among the institutions to be looked at are political machines, police departments, courts, schools, prisons, public authorities, and universities. Focuses on readings and discussions.

11.025[J]* **D-Lab: Development**
Issues in international development, appropriate technology and project implementation addressed through lectures, case studies, guest speakers and laboratory exercises. Students form project teams to partner with community

organizations in developing countries, and formulate plans for an optional IAP site visit. Recitation sections focus on specific project implementation, and include cultural, social, political, environmental and economic overviews of the target countries as well as an introduction to the local languages. Enrollment limited by lottery; must attend first class session.

11.027* **City to City: Comparing, Researching, and Reflecting on Practice**
Introduces students to practice through researching, writing, and working for and with nonprofits. Students work directly with nonprofits and community partners to help find solutions to real world problems; interview planners and other field experts, and write and present findings to nonprofit partners and community audiences.

11.029[J]*^ **Mobility Ventures: Driving Innovation in Transportation Systems**
Explores technological, behavioral, policy, and systems-wide frameworks for innovation in transportation systems, complemented with case studies across the mobility spectrum, from autonomous vehicles to urban air mobility to last-mile sidewalk robots. Students interact with a series of guest lecturers from CEOs and other business and government executives who are actively reshaping the future of mobility. Interdisciplinary teams of students collaborate to deliver business plans for proposed mobility-focused startups with an emphasis on primary market research.

11.041* **Introduction to Housing, Community, and Economic Development**
Provides a critical introduction to the shape and determinants of political, social, and economic inequality in America, with a focus on racial and economic justice. Explores the role of the city in visions of justice. Analyzes the historical, political, and institutional contexts of housing and community development policy in the US, including federalism, municipal fragmentation, and decentralized public financing. Introduces major dimensions in US housing policy, such as housing finance, public housing policy, and state and local housing affordability mechanisms. Reviews major themes in community economic development, including drivers of economic inequality, small business policy, employment policy, and cooperative economics.

11.067* **Land Use Law and Politics: Race, Place, and Law**
Explores conceptions of spatial justice and introduces students to basic principles of US law and legal analysis, focused on property, land use, equal protection, civil rights, fair housing, and local government law, in order to examine who should control how land is used. Examines the rights of owners of land and the types of regulatory and market-based tools that are available to control land use, and discusses why and when government regulation, rather than private market ordering, might be necessary to control land use patterns.

Explores basic principles of civil rights and anti-discrimination law and focuses on particular civil rights problems associated with the land use regulatory system, such as exclusionary zoning, residential segregation, the fair distribution of undesirable land uses, and gentrification. Introduces basic skills of statutory drafting and interpretation.

11.074*^ **Cybersecurity Clinic**
Provides an opportunity for MIT students to become certified in methods of assessing the vulnerability of public agencies (particularly agencies that manage critical urban infrastructure) to the risk of cyberattack. Certification involves completing an 8-hour, self-paced, online set of four modules during the first four weeks of the semester followed by a competency exam. Students who successfully complete the exam become certified. The certified students work in teams with client agencies in various cities around the United States. Through preparatory interactions with the agencies, and short on-site visits, teams prepare vulnerability assessments that client agencies can use to secure the technical assistance and financial support they need to manage the risks of cyberattack they are facing. Students taking the graduate version complete additional assignments. Limited to 15.

11.138^ **Crowd Sourced City: Civic Tech Prototyping**
Investigates the use of social media and digital technologies for planning and advocacy by working with actual planning and advocacy organizations to develop, implement, and evaluate prototype digital tools. Students use the development of their digital tools as a way to investigate new media technologies that can be used for planning. Students taking the graduate version complete additional assignments.

11.165^ **Urban Energy Systems and Policy**
Examines efforts in developing and advanced nations and regions. Examines key issues in the current and future development of urban energy systems, such as technology, use, behavior, regulation, climate change, and lack of access or energy poverty. Case studies on a diverse sampling of cities explore how prospective technologies and policies can be implemented. Includes intensive group research projects, discussion, and debate. Students taking the graduate version complete additional assignments.

11.188^ **Introduction to Spatial Analysis and GIS Laboratory**
An introduction to Geographic Information Systems (GIS), a tool for visualizing and analyzing spatial data. Explores how GIS can make maps, guide decisions, answer questions, and advocate for change. Class builds toward a project in which students critically apply GIS techniques to an area of interest. Students build data discovery, cartography, and spatial analysis skills while learning to

reflect on their positionality within the research design process.

11.C35[J]^ **Interactive Data Visualization and Society**
Covers the design, ethical, and technical skills for creating effective visualizations. Short assignments build familiarity with the data analysis and visualization design process. Weekly lab sessions present coding and technical skills. A final project provides experience working with real-world big data, provided by external partners, in order to expose and communicate insights about societal issues. Students taking the graduate version complete additional assignments. Enrollment limited.

6.100A^ **Introduction to Computer Science Programming in Python**
Introduction to computer science and programming for students with little or no programming experience. Students develop skills to program and use computational techniques to solve problems. Topics include the notion of computation, Python, simple algorithms and data structures, testing and debugging, and algorithmic complexity. Combination of 6.100A and 6.100B or 16.C20[J] counts as REST subject. Final given in the seventh week of the term.

6.100B^ **Introduction to Computational Thinking and Data Science**
Provides an introduction to using computation to understand real-world phenomena. Topics include plotting, stochastic programs, probability and statistics, random walks, Monte Carlo simulations, modeling data, optimization problems, and clustering. Combination of 6.100A and 6.100B counts as a REST subject.

6.1010^ **Fundamentals of Programming**
Introduces fundamental concepts of programming. Designed to develop skills in applying basic methods from programming languages to abstract problems. Topics include programming and Python basics, computational concepts, software engineering, algorithmic techniques, data types, and recursion. Lab component consists of software design, construction, and implementation of design. Enrollment may be limited.

Course 11, 11-6-Friendly UROP Areas

- City Form Lab
- Civic Data Design Lab
- CoLab
- Data + Feminism Displacement Research & Action Network
- Lab on Regional Innovation and Spatial Analysis
- MIT Age Lab
- Mobility Futures Collaborative

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- Norman B. Leventhal Center for Advanced Urbanism
- P-REX
- SENSEable City Lab
- Resilient Communities Lab
- + MORE!

Get Involved with Course 11, 11-6

- DUSP Student Council
- Transportation Club
- UrbanAfrica
- Students of Color Committee

Skills

- Mediate community disputes or assist in developing alternative plans for projects.
- Project management and evaluation
- Strong visualization abilities
- Advise planning officials on project feasibility, cost-effectiveness, regulatory conformance, or possible alternatives

Possible Future Jobs

- **Urban designer:** Responsible for designing all aspects of a community, from building architecture to landscapes to public transportation options. Focus on balancing functionality and aesthetics in all aspects of the community.
- **Project Architect:** Manage construction projects from the conceptual design phase through completion of construction, leading teams of engineers and contractors to meet client schedule and budget.
- **Real Estate Developer:** Responsible for building or renovating homes, offices, retail centers or industrial sites

Career Industry Examples

Architecture	City Design	Community development
Landscaping	Transportation	Sustainability consulting

Sample Employers

Atlantic Media	Boston Planning & Development Agency

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Gensler

Jacobs

Keolis America Inc.

Local & State Governments

Stanec

Vanasse Hangen Brustlin

Volpe Center