The Master of Design for Sustainable Urban Environments (MDes-SUEN) is a unique program of study in which urban landscape design, planning, and policy dovetail with environmental engineering, environmental science, art, and visualization. Boston’s history of innovation in environmental design as well as its legacy of urban redevelopment provide a rich backdrop and laboratory of urban, infrastructural, and ecological prototypes that ideally position the program to creatively and critically explore local issues with global implications.

Contemporary urban theory includes a significant body of writing in the area of “Landscape” and “Ecological-Urbanism,” a critical discourse that looks at the full range of environmental strategies for urban sites with an emphasis on ecological thinking. The paradigm of sustainable environmental design is moving away from form-based planning toward dynamic ecosystem services. This program seeks to prepare students to be innovative and entrepreneurial designers able to combine economic, environmental, and social priorities to make next-generation public spaces and systems.

Programs

Master of Architecture (MArch)
- One-Year Program (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/one-year-program-march)
- Two-Year Program (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/two-year-program-march)
- Three-Year Program (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/three-year-program-march)
- Three-Year Program—Advanced Degree Entrance (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/three-year-program-advanced-degree-entrance-march)

Master of Design for Sustainable Urban Environments (MDes-SUEN)
- One-Year Program (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/one-year-program-mdes-suen)
- Two-Year Program (http://catalog.northeastern.edu/graduate/arts-media-design/architecture/two-year-program-mdes-suen)

Courses

Architecture Courses
ARCH 5110. Housing and Aggregation. 6 Hours.
Provides an understanding of multiunit housing in the United States and Europe. Working in teams, students develop new patterns of housing for Boston-area sites and develop those sites with their own individual interventions.

ARCH 5115. Option Studio. 6 Hours.
Offers an upper-level design studio that covers new studio topics, content, and studio instructors each semester. The studio instructors offer topical content that best aligns with their research and practice expertise, which provides students with the latest concepts in architectural design, theory, and research on a consistently updated and rotating basis. Students select their top choices of studio topics and instructors, giving them more flexibility in the areas for which they would like to focus their education.
ARCH 5120. Comprehensive Design Studio. 6 Hours.
Focuses on the materials and making of architecture. Considers architectural connections at all scales, from the nut and bolt to the scale of a door or window to the scale of the whole building and the city. Grounds design proposals upon a tectonic strategy, unlike traditional design studios that produce a schematic design before considering constructional ideas.

ARCH 5210. Environmental Systems. 4 Hours.
Explores the ways in which architectural form can create particular conditions of light and shadow; provide shelter from heat, cold, and rain; and incorporate systems that provide for water, electricity, and sanitation. Provides a series of simple and straightforward small-scale design projects.

ARCH 5211. Recitation for ARCH 5210. 0 Hours.
Provides a small-group discussion format to cover material in ARCH 5210.

ARCH 5220. Integrated Building Systems. 4 Hours.
Studies how to integrate into students’ building designs all the environmental and tectonic systems that they have covered in previous architecture courses.

ARCH 5230. Structural Systems. 4 Hours.
Introduces the fundamental concepts of structural analysis and design for architecture. Examines the nature of forces and their effects on different types of structural elements; the structural properties of shapes and materials; and the selection, analysis, and design of efficient structural systems that resist the loads acting upon them. Uses historical and contemporary examples to illustrate how the changing context of architectural ideas drives structural form and the selection of structural systems. Includes field trips and student presentations of structural models and diagrams. Restricted to students in the architecture BS program and to students in the three-year MArch program.

ARCH 5231. Recitation for ARCH 5230. 0 Hours.
Provides a small-group discussion format to cover examples from the material in ARCH 5230.

ARCH 5310. Design Tactics and Operations. 4 Hours.
Encourages students to develop the connections between critical attitudes and techniques in design, through important historical texts. Offers a kind of “great books” approach to the integration of design and history, introducing the writings and seminal designs of Alberti, Palladio, Wright, Le Corbusier, Semper, Sitte, Rowe, Colquhoun, Moneo, Koolhaas, Rossi, Frampton, Venturi and Scott Brown, Scarpa, and Lynch.

ARCH 5320. Applications of Architectural Design Methods. 4 Hours.
Explores the different means through which we analyze, interpret, and ultimately understand the built environment and how, in turn, the built environment contributes to our understanding of the world itself. Offers students an opportunity to learn how to think critically themselves, to learn to ask questions, and to develop their own perspectives on the production of architecture and design. Students who do not meet course prerequisites may seek permission of instructor.

ARCH 5530. Innovative Models in Real Estate Development and Design. 4 Hours.
Addresses advanced topics in real estate development and finance and examines innovative models of practice in real estate development available to design professionals. Studies a set of advanced analytical tools and techniques for evaluating the cash flows and economic returns of real estate investment and development. Introduces advanced methods of financing real estate and the structure of capital markets involved in property assets. Uses the case instruction method and includes active, discussion-oriented learning.

ARCH 5976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

ARCH 5978. Independent Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

ARCH 5984. Research. 1-4 Hours.
Offers an opportunity to conduct research under faculty supervision. May be repeated without limit.

ARCH 6100. Graduate Skills Studio. 6 Hours.
Provides a small-group discussion format to cover material in ARCH 5210.

ARCH 5211. Recitation for ARCH 5210. 0 Hours.
Offers a small-group discussion format to cover material in ARCH 5210.

ARCH 5220. Integrated Building Systems. 4 Hours.
Studies how to integrate into students’ building designs all the environmental and tectonic systems that they have covered in previous architecture courses.

ARCH 5230. Structural Systems. 4 Hours.
Introduces the fundamental concepts of structural analysis and design for architecture. Examines the nature of forces and their effects on different types of structural elements; the structural properties of shapes and materials; and the selection, analysis, and design of efficient structural systems that resist the loads acting upon them. Uses historical and contemporary examples to illustrate how the changing context of architectural ideas drives structural form and the selection of structural systems. Includes field trips and student presentations of structural models and diagrams. Restricted to students in the architecture BS program and to students in the three-year MArch program.

ARCH 5231. Recitation for ARCH 5230. 0 Hours.
Provides a small-group discussion format to cover examples from the material in ARCH 5230.

ARCH 5310. Design Tactics and Operations. 4 Hours.
Encourages students to develop the connections between critical attitudes and techniques in design, through important historical texts. Offers a kind of “great books” approach to the integration of design and history, introducing the writings and seminal designs of Alberti, Palladio, Wright, Le Corbusier, Semper, Sitte, Rowe, Colquhoun, Moneo, Koolhaas, Rossi, Frampton, Venturi and Scott Brown, Scarpa, and Lynch.

ARCH 5320. Applications of Architectural Design Methods. 4 Hours.
Explores the different means through which we analyze, interpret, and ultimately understand the built environment and how, in turn, the built environment contributes to our understanding of the world itself. Offers students an opportunity to learn how to think critically themselves, to learn to ask questions, and to develop their own perspectives on the production of architecture and design. Students who do not meet course prerequisites may seek permission of instructor.

ARCH 5530. Innovative Models in Real Estate Development and Design. 4 Hours.
Addresses advanced topics in real estate development and finance and examines innovative models of practice in real estate development available to design professionals. Studies a set of advanced analytical tools and techniques for evaluating the cash flows and economic returns of real estate investment and development. Introduces advanced methods of financing real estate and the structure of capital markets involved in property assets. Uses the case instruction method and includes active, discussion-oriented learning.

ARCH 5976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

ARCH 5978. Independent Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

ARCH 5984. Research. 1-4 Hours.
Offers an opportunity to conduct research under faculty supervision. May be repeated without limit.

ARCH 6100. Graduate Skills Studio. 6 Hours.
Provides a small-group discussion format to cover material in ARCH 5210.

ARCH 5211. Recitation for ARCH 5210. 0 Hours.
Offers a small-group discussion format to cover material in ARCH 5210.

ARCH 5220. Integrated Building Systems. 4 Hours.
Studies how to integrate into students’ building designs all the environmental and tectonic systems that they have covered in previous architecture courses.

ARCH 5230. Structural Systems. 4 Hours.
Introduces the fundamental concepts of structural analysis and design for architecture. Examines the nature of forces and their effects on different types of structural elements; the structural properties of shapes and materials; and the selection, analysis, and design of efficient structural systems that resist the loads acting upon them. Uses historical and contemporary examples to illustrate how the changing context of architectural ideas drives structural form and the selection of structural systems. Includes field trips and student presentations of structural models and diagrams. Restricted to students in the architecture BS program and to students in the three-year MArch program.

ARCH 5231. Recitation for ARCH 5230. 0 Hours.
Provides a small-group discussion format to cover examples from the material in ARCH 5230.

ARCH 5310. Design Tactics and Operations. 4 Hours.
Encourages students to develop the connections between critical attitudes and techniques in design, through important historical texts. Offers a kind of “great books” approach to the integration of design and history, introducing the writings and seminal designs of Alberti, Palladio, Wright, Le Corbusier, Semper, Sitte, Rowe, Colquhoun, Moneo, Koolhaas, Rossi, Frampton, Venturi and Scott Brown, Scarpa, and Lynch.

ARCH 5320. Applications of Architectural Design Methods. 4 Hours.
Explores the different means through which we analyze, interpret, and ultimately understand the built environment and how, in turn, the built environment contributes to our understanding of the world itself. Offers students an opportunity to learn how to think critically themselves, to learn to ask questions, and to develop their own perspectives on the production of architecture and design. Students who do not meet course prerequisites may seek permission of instructor.

ARCH 5530. Innovative Models in Real Estate Development and Design. 4 Hours.
Addresses advanced topics in real estate development and finance and examines innovative models of practice in real estate development available to design professionals. Studies a set of advanced analytical tools and techniques for evaluating the cash flows and economic returns of real estate investment and development. Introduces advanced methods of financing real estate and the structure of capital markets involved in property assets. Uses the case instruction method and includes active, discussion-oriented learning.
ARCH 6340. Graduate Topics in Architecture. 4 Hours.
Explores focused research topics relevant to the graduate program curriculum. The professor presents his or her research related to a particular urban, architectural, or technical topic. This exposes the students to methods of research and topics in current and ongoing research in the field. The students have an opportunity to engage in related and parallel research projects during the course of the semester. May be repeated without limit.

ARCH 6430. Case Studies 1. 4 Hours.
Focuses on how architectural practice occurs and must be understood within a larger social context. The cultures-interests and objectives of the constellation of participants in the bringing of a building to completion are dynamic, diverse, and complex, especially in an urban environment. Seeks to make sense of this broader social contract from within the perspective of professional design practice. As one of many participants in the process of bringing a building to completion, students review the roles, responsibilities, and interests of each contributor. Our task is to understand the obligations and constraints that constitute these relationships. Examines the products of design as manifestations of these relationships and situates them within a discourse of value-determined actions. Investigates normative and critical professional practices through selected readings and individual field research. Develops project case studies that provide examples of excellent design results achieved through the application of expert professional practices.

ARCH 6440. Case Studies 2. 4 Hours.
Continues ARCH 6430. Builds on the understanding of professional practice developed in the previous course and investigates the array of "artful ways in which some practitioners deal competently with the indeterminacies and value conflicts of practice." These indeterminacies, uncertainties, and value conflicts are part of a rapidly changing, dynamic world. There is an unprecedented need for flexible and responsive practices that can bridge the gap between traditional professional techniques and these situations. Requires core competencies that are not mismatched with the changing situations of practice. Requires new skills as well as traditional analytic techniques to respond adequately to these unique conditions of work. Through a closer examination and development of an in-depth project case study, students speculate on possible approaches to a revised and restructured model of professional knowledge and guidelines for reflective practice that can sustain a culture of design excellence.

ARCH 6960. Exam Preparation—Master’s. 0 Hours.
Offers the student the opportunity to prepare for the master’s qualifying exam under faculty supervision.

ARCH 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ARCH 6964. Co-op Work Experience. 0 Hours.
Provides eligible students with an opportunity for work experience. May be repeated without limit.

ARCH 6966. Practicum. 1-4 Hours.
Provides eligible students with an opportunity for practical experience. May be repeated without limit.

ARCH 7000. Qualifying Exam. 0 Hours.
Provides eligible students with an opportunity to take the master’s qualifying exam.

ARCH 7130. Master’s Research Studio. 6 Hours.
Offers the research portion of a two-part graduate project focused on the complex issues facing the postindustrial landscape of the contemporary city. Examines in detail the design elements of everyday building types, such as office buildings, labs, parking garages, and retail spaces, with an eye toward creating new prototypes for urban architecture that are informed by the realities of contemporary market forces. Provides the foundation for the more speculative design proposals of ARCH 7140. May be repeated without limit.

ARCH 7140. Master’s Degree Project. 6 Hours.
Offers the second of a two-part degree project focused on manipulating contemporary market-driven building types. Seeks to invent new variations and hybrids from the existing store of urban building types to address new challenges, such as irregular sites, new adjacencies, and other unmet demands in cities. Based on research, analysis, and modeling of different types done in the first semester, offers students an opportunity to propose synthetic solutions to the complex problems of postindustrial development, housing, and identity facing the contemporary city. May be repeated without limit.

ARCH 7962. Elective. 1-4 Hours.
Offers elective credit for courses taken at consortium institutions. May be repeated without limit.

ARCH 7976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on chosen topics. May be repeated without limit.

ARCH 7978. Independent Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

ARCH 7996. Thesis Continuation. 0 Hours.
Offers thesis supervision by members of the department.

MDES-SUEN COURSES
SUEN 6110. Graduate Studio 1: Sustainable Urban Sites. 6 Hours.
Offers a studio-based graduate-level introduction to design and management of sustainable urban sites. Core topics include fundamental site analysis, formal organization, spatial definition, and site operations. Emphasizes the contextual, programmatic, performative, aesthetic, and experiential aspects of waterfront and brownfield revitalization, with a focus on urban and landscape ecology best management practices (BMPs). Key tools and media are introduced and practiced in increasingly complex applications, including basic drawing, modeling, and design software.

SUEN 6120. Graduate Studio 2: Sustainable Urban Systems. 6 Hours.
Offers a graduate-level studio following SUEN 6110 and introducing fundamental landscape planning, design, and strategic management of environmental infrastructures at the urban and regional scale. Core topics include the spatial and operational role in the built landscape of living systems—such as constructed wetlands, urban forests, urban wilds, and managed habitats—and their dynamic relationship to recreation, transit, food, housing, and industrial networks. Emphasizes the integration of constructed ecologies into the cultural landscape around issues of environmental justice. Continues the introduction of key tools and media from SUEN 6110, including advanced digital drawing, modeling, and design communication.
SUEN 6210. Implementation and Visualization for Urban Environments 1. 4 Hours.
Offers an intensive introduction to site analysis and manipulation of earthworks, water, and vegetation, with a focus on disturbance regimes within waterfront and brownfield zones. Core topics emphasize the ecological services promoted by the urban environment, including urban soil structure; contouring the urban surface; regional plant communities; and storm water, surge, and tidal flux management. Supports development of implementation skills by training in vector, raster, and 3D modeling software. Constitutes the first half of a two-part sequence and provides the foundation for SUEN 6220.

SUEN 6220. Implementation and Visualization for Urban Environments 2. 4 Hours.
Constitutes the second half of a two-part sequence and builds upon material in SUEN 6210. Core topics include an introduction to regional landscape ecology in urbanized watersheds. Focuses on landscape-scale systems and soft infrastructure. Introduces GIS and geo-design software as a lens to learn about and visualize change in regional environments. Offers students an opportunity to advance landscape analysis and visualization skills through further training in vector, raster, and 3D modeling software.

SUEN 6310. Cities, Nature, and Design in Contemporary History and Theory. 4 Hours.
Offers a lecture course presenting a historical overview of evolving cultural, environmental, and technological influences on societal attitudes toward the relationship of cities, nature, and design. Core topics include the emergence of critical theories, aesthetic philosophies, and design typologies in the modern era of industrialization and the subsequent impact of information, participation, and globalization trends on twenty-first-century-designed urban environments.

SUEN 6340. Topics in Urban Environmental Design. 4 Hours.
Offers a lecture- and discussion-based course focusing on research themes relevant to the MDes-SUEN graduate program curriculum. Topics are developed based upon instructor’s research relative to particular urban, ecological, sociological, landscape architectural, or technical subjects. Exposes students to cutting-edge methods of research and practice in designed urban environments. May be repeated up to two times.

SUEN 6964. Co-op Work Experience. 0 Hours.
Offers eligible students an opportunity for work experience. May be repeated up to two times.

SUEN 6966. Practicum. 1-4 Hours.
Offers eligible students an opportunity for practical experience. May be repeated up to seven times for up to 8 total credits.

SUEN 7130. Master’s Research Studio: Design and the Resilient City. 6 Hours.
Offers an advanced graduate studio focusing on contemporary landscape and urbanism research strategies. Themes include ecological, economic, and social resiliency in urban environments. Offers students an opportunity to formulate original approaches to design research. Uses integrated analysis, visualization, and conceptualization skills to progress through group and individual exercises with a focus on design thinking for climate change, water rise, public health and security, and other issues of global relevance. Requires the formulation of a design thesis for resilient urban environments, presented and defended in written, oral, and digital formats, which provides the basis for development of individual design proposals in SUEN 7140. Requires permission of the Urban Landscape program for students without a BARCH, BLA, MARCH, MCP, MLA, MRP, MUD, or equivalent. May be repeated once.

SUEN 7140. Master’s Research Studio: Master’s Project. 6 Hours.
Constitutes the second half of the Master’s Research Studio sequence. Using the design thesis established in SUEN 7130, offers students an opportunity to formulate proposals for intervention into a specific urbanized environment. Individual projects progress with instructor guidance from schematic phasing through design development, with a focus on change management and vitalization of the ecologic, economic, social, and aesthetic facets of contemporary cities and regions. Requires individual presentation and defense of master’s projects in written, oral, and digital formats. May be repeated once.

SUEN 7230. Urban Ecologies and Technologies 1. 4 Hours.
Offers a workshop-based course as the first in a two-part sequence. Lectures, in-class exercises, and site-based investigation use case-study methods to document ecotechnologies operating in the built environment, with a focus on design and implementation metrics, material life cycle management, funding models, and aesthetic and cultural aspects. Potential topics include green roofs, green walls, bioswales, pervious pavements, constructed wetlands, “complete streets” elements, geosensor networks, alternative waste management, water detention and energy generation methods, and living infrastructure for coastal environments.

SUEN 7240. Urban Ecologies and Technologies 2. 4 Hours.
Offers a community outreach course as the second in a two-part sequence and builds upon SUEN 7230. The core theme is development of innovative, market-based ecotechnology prototypes for the urban landscape that contribute to the environmental and cultural life of the city. With instructor guidance, offers students an opportunity to identify a potential ecotechnology project to design through engagement with community members, public, or institutional clients. The course outcome includes site documentation; a schematic design proposal produced by students working in groups; and, if appropriate in terms of time, budget, and scale, implementation.

SUEN 7320. Pro-Seminar: Issues in Designed Urban Environments. 4 Hours.
Offers an advanced graduate seminar examining the forces shaping designed urban environments in contemporary global culture. A diverse range of material from published design criticism to open source social media engagement provides basis for discussion and written and oral presentations. Course themes determined by the instructor parallel the studio sequence SUEN 7130 and SUEN 7140, although discussion topics are broadly presented to engage graduate students from any background. May be repeated up to three times.

SUEN 7978. Independent Study. 1-6 Hours.
Offers independent work under the direction of members of the department and/or interdisciplinary faculty. Course content is defined and approved by instructor. May be repeated up to 11 times for up to 12 total credits.