

# Catalog

## **Master in Design Studies: MDesS Postprofessional Degree**

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The post-professional non-studio MDesS degree program has long enabled students with specialized interests to pursue advanced studies in areas such as history and philosophy of design, technology, sustainability, urbanism, housing, project management, and real estate. These areas of study complement the traditional elements of the GSD curriculum—architecture, landscape architecture, urban design, and urban planning—and allow students to design a cross-disciplinary course of study that enables a higher level of specialization.

The program currently offers five primary areas of study—History and Philosophy of Design, Technology, Sustainable Design, Housing and Urbanization, and Real Estate. Project Management studies are now part of the real estate area. Students explore their interests through course work and independent study, including an optional independent thesis. Students are already expected to have a strong professional background and be familiar with the design and planning professions, and, consequently, do not take normal design studios. (Students who seek advanced studio training should explore the MArch II, MLA II, MAUD, or MLAUD programs.)

### **Preparation for Admission**

Applicants to the MDesS program normally hold a professional degree in architecture, landscape architecture, or urban planning and design. Applicants with a degree in a related discipline such as engineering, computer science, or industrial design may also qualify for admission. The program seeks applicants who have demonstrated overall academic and/or professional achievement in the design fields and who have the potential for advanced work in the area selected for study.

Applicants must specify which of the offered areas of study they wish to pursue. Each area has specific course requirements and electives and is under the guidance of an area academic coordinator. The area coordinator also typically serves as the academic advisor of students in a specific concentration area. The specific course work is customized to each student's qualifications and academic and professional objectives and is constructed by the individual student in consultation with his or her academic advisor.

**Residence** Three terms of full-time study in residence is required for students entering into the program during the 2009-10 academic year. At the discretion of the Admissions Committee, qualified candidates with extensive academic or professional experience may be eligible for one term of advanced placement on admission, enabling them to complete the program in two terms. Under certain circumstances, students may receive permission to reduce their course load and extend their studies to four terms.

**Requirements for Award of Degree** A candidate who enters the program in academic year 2009–2010 will be recommended for the Master in Design Studies degree upon satisfactory completion of 48 units of academic work. Each student is typically required to complete a minimum of 12 units in his or her area of study from an approved list of courses published each term for each of the primary areas noted below. If due to faculty sabbaticals or other constraints a required course is not offered in a given year, the area coordinator will determine alternate courses that meet the requirements. Certain areas of study have higher unit requirements. Each student is also required to complete a substantial research study in his or her area, either via a thesis or an approved 4-unit course that has a research component and culminates in either a scholarly paper or an equivalent project involving independent research. No more than 12 units from the total of 48 may be from independent study courses and no more than 16 units from non-GSD courses.

Applicants granted advanced standing on admission are expected to complete 32 units, 8 units in his or her area from the approved list of courses for that area, and a research paper or project as described above. No more than 8 units from the total of 32 may be from independent study courses and no more than 12 units from non-GSD courses.

None of the required units may be fulfilled by courses credited toward another degree. The faculty advisor must approve a student's course of study and can make exceptions to the maximum number of units allowed through independent study or non-GSD courses. Permission of the faculty advisor is required to waive a required course or to make a substitution. MDesS students are required to have their course selection approved by their advisors prior to registration.

**AREAS OF STUDY** The following four primary areas of study are currently offered—History and Philosophy of Design, Technology, Real Estate, Sustainable Design, and Urbanization and Housing. Each area of study is lead by an

area coordinator. Please see the MDesS web site at <http://www.gsd.harvard.edu/academic/mdes/index.html> for the names of the area coordinators.

### ***History and Philosophy of Design***

This area of study provides a setting for scholarly study (as distinct from project design) within the area of historical studies and design theory as they are related to the GSD's core offerings in architecture, landscape architecture and urban design and planning. The program is directed towards individuals already having some background or interest in the history and philosophy of design and the built environment who wish to pursue advanced scholarship, and to others interested in expanding their knowledge of contemporary theory and analysis. Like the other areas of the MDesS program, the program in History and Philosophy of Design is intentionally interdisciplinary both within the GSD and with other schools and institutes within the University.

Since this program of study is set within the context of a series of strong professional programs in architecture, landscape architecture, urban design and planning, it seeks to explore history and theory concerns as they especially relate to these disciplines; and, as such, has a different form and focus than traditional programs in the history of art and architecture. It especially focuses on the rich dialogue and discourse that occurs between history and theory studies on the one hand, and the more speculative concerns of the GSD's professional programs.

The program of study includes several foundation courses that provide an introduction to relevant discourse as well as an exposure to history and theory faculty. Additional courses may be drawn from a range of lecture and seminar courses that reflect faculty interests. A sampling of these interests includes courses from the history of art and architecture, history of modern architecture and urbanism, the history of science and technology in relation to architecture, modernity and European landscape architecture, experimental architecture of the 1970s, and many others. By the end of the first semester students are expected to identify an area of interest to pursue in depth through the preparation of a scholarly paper or thesis involving independent research.

Students in the MDesS program will have access to a rich array of resources. In addition to GSD offerings, students are able to take courses in the Department of History of Art and Architecture with its strong offerings in the history of Western art and architecture, as well as Islamic and Asian art. The study of architecture has a natural affinity with several courses of instruction offered in the Departments of the History of Science, American Civilization, History, and Literature (among others) and many GSD students enroll in courses in these areas. In addition to strong academic offerings in these and other University areas, there are many University-wide centers that are of interest to the graduate student in the History and Philosophy of Design area. The Barker Humanities Center serves as a venue for conversations among humanities scholars at Harvard, and hosts speakers and regular workshops on issues of culture, politics, art, history and other topics. There are also many workshops, conferences and guest speaker events at the Radcliffe Institute, the Charles Warren Center for the Study of American Culture, and the Minda de Gunzburg Center for European Studies, and other Harvard centers. In addition, students in the MDesS program may take courses at MIT, which also offers a broad range of history and theory courses.

### **Course Requirements**

#### **First Term**

2 Units 4201M1 Building Texts and Contexts  
2 Units 4202M2 Building Texts and Contexts  
2 Units 4205M1 Building Texts and Contexts  
2 Units 4206M2 Building Texts and Contexts  
2 Unit 6212 Module Sustainability for Planning and Design (required for all MDesS students)  
6 Units Electives\*

#### **Second Term**

2 Units 4203M1 Building Texts and Contexts  
2 Units 4204M2 Building Texts and Contexts  
12 Units Electives\*

#### **Third Term**

16 Units Electives\*

\* See the GSD 4000 series for other courses. Students are also encouraged to explore related offerings in History of Art and Architecture by the Faculty of Arts and Sciences (FAS), Harvard University.

### ***Sustainable Design***

Sustainable Design - an area of renewed focus within the MDesS program - addresses concepts and technologies at various scales ranging from urban neighborhoods and landscape design down to individual buildings and products. Faced with climate change and an emerging shortage of essential resources, our society increasingly experiences the need to understand and apply sustainable design principles at all levels of the built environment. In order to develop holistic solutions for these challenges our students are learning about sustainable design concepts and technologies at various scales. Our graduates often end up working in architectural practice, academia, consulting, and policy.

Courses with a focus on buildings teach methods and technologies that support the design of comfortable and less resource-intensive environments. Particular areas of specialization are lighting and daylighting design, building performance simulation (energy and lighting), green building performance metrics, green roofs, automated controls, occupant behavior and satisfaction, acoustics, as well as lifecycle and embodied energy studies. A key objective is for our students to employ and further develop design tools and metrics to evaluate the indoor environmental performance and energy-efficiency of buildings at the various design stages.

Rather than concentrating on how to use any particular software, courses concentrate on the process of when and how different design tools can be used to effectively support key design decisions. Students are expected to develop a thorough understanding of the underlying assumptions and limitations of current approaches to model and assess a building's environmental performance. Equipped with this knowledge they are then encouraged to critically review and think beyond the performance metrics that are currently promoted by green building rating systems such as the US Green Building Council's LEED system. A strong emphasis is placed on the role building occupants' play in the success or failure of any particular technology.

Beyond the building scale the course in sustainable design assesses the environmental effect of buildings within their larger context, including issues of climate and ecology at the urban and landscape level. Sustainability studies on this scale pursue a broad range of topics that may include the impact of urban and landscape design on local climatic conditions (heat, humidity, wind flows etc.), the investigation and design of water management techniques, traffic and infrastructure studies, strategies for brown fields and other disturbed sites, questions of landscape ecology, and many others. Research topics vary dependent on faculty and student interests.

Students are further encouraged to also include courses at other Harvard Schools (for example, School of Public Health) in their curriculum, as well as considering relevant courses at MIT.

## **Course Requirements**

### **First Term**

4 Units GSD 6332 Day-Lighting Buildings

2 Unit Module 6212 Sustainability for Planning and Design (required for all MDesS students)

10 Units Electives\*\*

\*\*Apart from the required courses you are encouraged to also take the following two courses during the fall 2009 term

6419 Natural Building Ventilation (2 credits)

EH522 Indoor Environmental Quality and Health (2 credits)

### **Second Term**

4 Units GSD 6412 Sustainability

12 Units Electives\*

**Third Term** 4 Units GSD 6417 Building Performance Simulation – Energy

4 Units GSD 9304 Independent Thesis

8 Units Electives\*

\* See the GSD 6000 series for elective courses.

## ***Real Estate***

Understanding how to implement the built environment is a central aspect of design education. The Real Estate area at the GSD addresses professionals who want to pursue further studies on real estate development and investment realms related to the building industry and the built environment, starting from conceiving the communities and buildings, to the planning and managing of entitlements, design, finance, construction, marketing and operating the buildings. Most courses address both US and international projects and are based on case studies, emphasizing a hands-on experience in real world situations requiring judgment and the making of responsible decisions under many different conditions. The

program is geared to students from professional real estate, construction and other diverse backgrounds as well as designers who want to enhance or change their careers and search for alternative practice models. The immersion of the program in a design school allows the students to complement their course of study with subjects from other areas toward a broader education. The course of study in this area is significantly enhanced by access to the Real Estate Academic Initiative [www.reai.harvard.edu](http://www.reai.harvard.edu) at Harvard University, the RMJM program on Integrated Design, the Zofnass program on Infrastructure and Large Scale Sustainability and to the industry liaisons of the faculty, through which students convene in workshops, forums and symposia with the world's leading real estate investors, fund managers, developers, project managers and contractors.

Within the Real Estate Area there are four sub-areas of concentration:

#### Real Estate Development

This sub-concentration prepares graduates for careers in real estate and urban development, both private and public sector. It emphasizes analytical skills, decision-making, development processes, political, environmental, legal, and general urban context knowledge. Graduates pursue careers in development of all product types: land, housing, office, retail, industrial, hotel, and mixed-use.

#### Real Estate Investment

This sub-concentration prepares graduates for careers in real estate investment and finance. It combines analytical skills in investment and finance with decision-making about development, political, legal, and urban context knowledge. Graduates enter careers in fund management, mortgage finance, investment banking, REITs, hedge funds, and private equity.

#### Management and Leadership

This area prepares graduates for leadership positions in the building and infrastructure industries, within design, development, construction - project management, and consulting enterprises. Business issues related to integrating and managing the design & innovation process with project and product delivery are combined with strategic, operational, and financial skill-building.

#### Sustainable Real Estate

This sub-concentration addresses the needs and challenges faced increasingly by real estate and design professionals in responding to environmentally sensitive, "green," and sustainable development practices. It focuses on concepts and applications of technologies of sustainability at various scales ranging from urban communities, landscape design, to individual buildings. The curriculum is enriched with courses offered by faculty members who specialize in development, sustainable design, and building technology.

### **Course Requirements**

#### **First Term\*\*\***

- 4 Units 5203 Markets and Market Failures
- 4 Units 5204 Real Estate Development and Finance
- 2 Unit 6212 Sustainability for Planning and Design (required for all MDesS students)
- 4 Units 7411: Design and Development: from Concept to Implementation
- 4 Units 7440: Leading the Design Firm

\*\*\* At least 10 units will be chosen out of this group for the first term in consultation with the student's advisor.

#### **Second Term**

- 4 Units 5103 Public and Private Development
- 4 Units 5403 M3 Public approvals for private development projects  
M4 Design Typologies and Financial Operation for Urban Developments
- 8 Units Electives

#### **Third Term**

16 Units Electives\*

\* See the GSD 5000, 6000 and 7000 series for elective courses. Students are also encouraged to explore related offerings at the Business and Kennedy Schools at Harvard University and at MIT.

## ***Technology***

This study area positions technology as fundamental to design inquiry. Studies offered in this broad area include those directed towards design computation and an understanding of the specific properties and characteristics of the materials and systems that make up the basic fabrics of buildings and landscapes; and studies that specifically address design, simulation, manufacturing and fabrication technologies; and implementation procedures, processes and tools. Courses open to MDesS students occur within the broad context of technology initiatives offered at the GSD as a whole. Theme areas addressed within the MDesS program include advanced materials and systems, design computation; digital design and manufacturing; construction automation and robotics; and product development issues. The emphasis in the program, however, is on how innovation results when developments in each of these primary areas intersect and interact with one another. The interdisciplinary challenge of designing responsive environments is currently of particular interest at the GSD.

**Building Technology Studies** Courses in advanced materials and systems address innovative developments in high performance materials (composites, laminates, other) and in the emerging smart materials field. The GSD has long had an involvement with developing applications of these new materials and technologies to the architectural field. In addition to facilities for load-testing materials, the GSD's Materials Collection also houses samples of different high performance and smart materials that can be accessed by students. Courses in advanced structural systems address innovative developments in several areas. Special emphasis is placed on the adoption of high performance and smart materials (self-healing, solar), fabrication technologies (CAD/CAM), and design computation methods (form-finding). A variety of structural analysis and optimization programs are available for students to use in both form-finding and in simulation studies. Other courses are more practice-based and explore the intersection between structural innovation and architecture as it occurs in the offices of leading structural engineers.

Courses in digital design and manufacturing (CAD/CAM) and robotic fabrication reflect one of the core strengths of the GSD's program in building technologies. They emphasize architectural applications, but address product design as well. These new design and production techniques and methods allow architects and designers to move beyond conventional design paradigms. Students are introduced to the principles of advanced parametric digital modeling (e.g., digital environments such as CATIA, Digital Project, or SolidWorks) and fabrication-specific computation (scripting and programming techniques), the operation and use of numerically-controlled machines (CNC technologies), and the programming and deployment of industrial robots. Strategies for prototyping are explored as well. This thematic area of study makes extensive use of the GSD's CAD/CAM and robotic fabrication facilities described elsewhere (see <http://www.gsd.harvard.edu/inside/cadcam/>).

**Design Computation** This thematic area focuses on design computational techniques in architecture, landscape architecture and urban design and planning as they specifically relate to design and simulation processes and procedures. The array of topics addressed includes computational methods associated with form-generation, scripting, interactive spaces, geographic information systems, physical computing and others.

The area broadly covers digital modeling, scripting, and visualization, but focuses also on advanced topics that reflect faculty interests. These interests include recent theories of form in architecture that employ computational methods for definition, description, and manipulation. From algorithmic design to open source and from virtual reality to robotics, many designers are seeking new tools to explore formal and functional properties as sources of ordering systems. Related procedures include developing algorithms and computational methods that encapsulate the processes that lead to the generation of meaningful architectural form. Other interests include the exploration of motion in architecture, as well as, the use and potential of interactive spaces. Parametric design and related issues are explored in a variety of ways, but quite directly in relation to the GSD's strong presence in the CAD/CAM field noted previously. Also explored are Building Information Models as a means for creating information linkages between participants in the spectrum of design manufacturing and construction processes.

## **Course Requirements**

### **First Term**

4 Units GSD 6317 CAD/CAM

4 Units GSD GSD 2404: Superficial Spaces / Formalism Now

Or

GSD 2310 Sculpting in Motion

2 Unit 6212 Sustainability for Planning and Design (required for all MDesS students)

6 Units Electives\*

**Second Term**

4 Units GSD 6331 Building Information Modeling

12 Units Electives\*

**Third Term** 4 Units GSD 9304 Independent Thesis

12 Units Electives\*

\* See the GSD 6000 and 7000 series for elective courses

***Urbanization and Housing***

The study of Urbanization and Housing in the Master in Design Studies (MDesS) program at the GSD is addressed to graduate students with a background in design and planning who have a strong interest in rethinking and reshaping our urban environments and their relations to their surrounding suburban and large scale landscape contexts. The program focuses on the role of the design and planning community in the physical transformation and evolution of our urban environments. The field inherently addresses the basic elements of urban place and place-making within broad perspectives that reflect the diverse socioeconomic, sociopolitical, legal, and cultural dimensions that influence how our cities develop. Urban design concerns, master planning, landscape, housing and other design elements that form “urban consciousnesses”—a phrase coined by former GSD Dean Josep Lluís Sert—are explicitly considered.

The course of studies in the program deals with growth and transformation processes, and considers both the theory and tools necessary to shape these processes. Students may focus on specific issues, including urban form, housing, environmental, and landscape design within the city. Nonetheless, the basic elements of urban place are both philosophically and actually interdependent.

Many students in this area are also pursuing study in other Harvard University schools such as the Kennedy School of Government and the School of Public Health, which contributes rich diversity in experience, viewpoint and research outcomes. A unique resource available to students in this area includes the Harvard University Joint Center for Housing Studies and the Center for Environmental Studies.

**Course Requirements****First Term**

4 Units GSD 3503 Urban Design Proseminar

2 Unit Module Sustainability for Planning and Design (required for all MDesS students)

10 Units Electives\*

**Second Term**

4 units GSD 5473 Housing Policy in the United States: The Intersection of the Public and Private Sectors

4 Units GSD 5475 Design of Housing in the United States

12 Units Electives\*

**Third Term** 4 Units GSD 9304 Independent Thesis

12 Units Electives\*

\* See the GSD 3000 and 5000 series for elective courses.