2020-2021

MIT
Architecture, Art, and Design Undergraduate Programs

MIT

The Department of Architecture
Adheres to MIT's Nondiscrimination Policy:
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MIT Architecture Course 4 Undergraduate Programs

Overview
Majors and Minors at MIT

When you apply to MIT, you apply to the entire university, not to a specific major or school. All first-year students begin MIT with an undeclared major. During freshman year, MIT will provide academic fairs, lectures, seminars, exploratory classes, and other programs to help students determine which major will suit them best; they then are free to choose from MIT's majors, without any additional requirements or admission procedures.

MIT offers a total of 53 major and 58 minor programs. Choosing a major is an important decision and is not necessarily the same as choosing a career, but for many students, their undergraduate major choice leads directly to a specific field and/or career. MIT is an interdisciplinary institution with a wealth of ongoing cross-departmental research.

Students declare their majors prior to their sophomore year, though most students do so by the end of freshman year. Data on how many students choose each major is available from the MIT Registrar's Office. Approximately 15 percent of students choose to double major; students may also choose up to two minors. Students who successfully complete a minor program will have the field of study specified on their student transcript, thus giving recognition of focused work in the discipline.

First-Year Subjects

First-Year Pre-Orientation Program (FPOP)

FPOP is offered in August as a way for incoming first-year students to get a sneak preview of the school. The program provides a brief overview of the School and a four-day whirlwind tour of Boston. Students actively engage with the places visited by asking questions about how the buildings and neighborhoods change over time, how they are used by residents and visitors, and how they interact with their context. Students work on a hands-on project with assistance from current majors. FPOP program information can be found on the Office of the First-Year website.

First-Year Discovery Subjects

4.001 Where Is and What Is Architecture & Design?
3 Units, Fall, Instructor: Paul Pettigrew

Introduces Architecture and Design through conversations and presentations with MIT architecture and design faculty and alumni. 4.001 discusses the two undergraduate majors, two undergraduate minors, and two HASS concentrations offered through Course 4 and careers in architecture and design. To better understand the breadth of architecture and design thinking, there will be visits to local architecture and design firms and student interviews of MIT alumni currently working as architects or designers.

First-Year Advising Seminars

Registration for Advising Seminars is through First-Year website.

4.A22, Physics of Energy
6 units, Fall, Instructor Les Norford

Ever wonder what makes a motor turn? How a windmill can make electricity? How a flashlight you shake can make light? How the range of an electric go-cart you'll drive compares to a gasoline-powered cart? In this seminar, we'll explore all sorts of systems that make, use, and convert electric power. We'll look at heat engines, electrical generators and motors, and circuits to control these devices. We will work in teams to develop energy experiments. Come if you're excited to build and want to learn about energy!

Department of Architecture Introductory Subjects

4.02A Design Studio: How to Design Intensive
9 units, IAP, HASS-A

This class is for students who are intending to major or minor in architecture or design. It is the first in a series of required design studios that Introduces fundamental design principles and combines hands-on practice with design theory. The class meets daily for three weeks during IAP and students receive HASS-A credit. It is the equivalent of 4.021 offered during Fall and Spring terms.

4.021 Design Studio: How to Design
12 units, Fall and Spring, HASS-A, Skylar Tibbits & Paul Pettigrew

This class is for students who are intending to major or minor in architecture or design. It is the first in a series of required design studios that Introduces fundamental design principles and combines hands-on practice with design theory. Develops students' ability to apply the foundations of design to any discipline. Students receive HASS-A credit.

4.110J Design Across Scales and Disciplines
12 units, Spring, HASS-A, Lee Moreau

This subject explores the reciprocal relationship between design, science, and technology. It covers a wide range of topics, such as industrial design, architecture, visualization/perception, design computation, material ecology, environmental design and environmental sustainability. Students examine how transformations in science and technology have influenced design thinking and vice versa, and develop methodologies for design research by collaboration on design solutions to interdisciplinary problems. It satisfies the HASS-A requirement.

4.605 A Global History of Architecture
12 units, Spring, HASS-A, Mark Jarzombek

This popular introductory class is a survey on the history of architecture and urbanism from Ancient Egypt to the present. The course satisfies one of the required classes for the major in Course 4, the HASS-A requirement, and provides a solid background for other classes in architecture history.

4.657 Design: The History of Making Things

The class examines themes in the history of design, with emphasis on Euro-American theory and practice in their global contexts. It addresses the historical design of communications, objects, and environments as meaningful processes of decision-making, adaptation, and innovation. It critically assesses the dynamic interaction of design with politics, economics, technology, and culture in the past and at present. Questions the class will pose include: How have processes and products of design been shaped by new technological possibilities? How have constraints, whether material, legislative, or aesthetic, impacted design? What role has design played in globalizing capitalist consumer desire, and how, in turn, has it been mobilized in the service of alternative economic and political systems? What are the ethics of design in the age of inequality and environmental crisis? Finally, how have the meanings we assign to design been mediated by magazines, exhibitions, corporate communication, glossy design monographs, and advertising?

MIT Architecture:
Course 4 and 4B Majors

The Department of Architecture offers two undergraduate majors providing a deep and broad education in the fields of architecture, art and design. Course 4 leads to the Bachelor of Science in Architecture (BSA), and Course 4B leads to the Bachelor of Science in Art and Design (BSAD).

Situated in MIT's rich and intense educational environment, the program emphasizes the interconnected relationship between architecture, design, building technology, computation, and history, theory and criticism of architecture, art and design. The Department's extensive offerings reflect the program's commitment to the cultural, social, political, technological and ecological issues of the built environment, and the teaching of art and design not just as a means to an end, but as a form of knowledge and creative practice. Committed to a rigorous and interdisciplinary approach, both programs challenge our students to be creative, innovative, and responsible leaders in the field.

The curriculum for both the BSA and BSAD are structured to teach essential basics in multiple disciplines and provide flexibility for exploration. The range of studios, lectures, workshops and seminars provides an active learning environment in which individual creativity and criticality can be nurtured. The programs are continually evolving to engage new ways of thinking about architecture, art and design.

Approximately 250 students register in the department each year, of whom about 30 are undergraduate majors and 60 are undergraduate minors. The Department offers over 100 courses annually (graduate and undergraduate) taught by a faculty of 70.

Course 4 Curriculum

Bachelor of Science in Architecture (BSA)

The Bachelor of Science in Architecture (BSA) degree is granted once all 17 General Institute Requirements (GIRs) as well as the department requirements of 192 units have been completed. All architecture majors will take the following core subjects during the sophomore or junior year.

- 4.021 Design Studio: How to Design (FA/SP, HASS-A, 12 units) or
4.02A Design Studio: How to Design Intensive (IAP, HASS-A, 9 units)
- 4.022 Design Studio: Introduction to Design Techniques and Technologies (FA/SP, 12 units, preq., 4.021 or 4.02A)
- 4.302 Foundations in Art, Design & Spatial Practices (SP, CI-M, 12 units)
- 4.401 Environmental Technologies in Buildings (FA, 12 units)
- 4.440J Intro. to Structural Design (SP, REST, 12 units; preq: 18.02)
- 4.500 Design Computing: Art, Objects and Space (FA, 12 units)
- 4.603 Understanding Modern Architecture, (FA, HASS-A, 12 units)

In their junior and senior years,
Students take the following more advanced subjects:

- 4.023 Architecture Design Studio 1 (FA, CI-M, 24 units, preq., 4.022)
- 4.024 Architecture Design Studio 2 (SP, 24 units, preq., 4.023, 4.401, 4.500)
- 4.025 Architecture Design Studio 3 (FA, 24 units. preq., 4.023, 4.440) or
- Two subjects from the list of Restricted Electives (next page)
- 4.501 Advanced Design Projects in Digital Fabrication (SP, 12 units) or
4.502 Advanced Visualization: Architecture in Motion Graphics (FA, 12 units)
- 4.605 The Global History of Architecture, (SP, HASS-A, 12 units) or
4.614 Building Islam, (FA, HASS-A, 12 units) or
4.635 Early Modern Architecture and Art, (FA, HASS-A, 12 units)

Restricted Electives

Two of the restricted electives listed below can be used to substitute for the final studio, 4.025 Architecture Design Studio 3.

Art, Culture and Technology (ACT)

• 4.307 Art, Architecture and Urbanism in Dialogue (FA, 12 units, HASS-A)
• 4.322 Introduction to Three-Dimensional Art Work (FA, 12 units, HASS-A)
• 4.341 Introduction to Photography & Related Media
(FA & SP, 12 units, HASS-A)
• 4.354 Introduction to Video and Related Media (FA, 12 units, HASS-A)
• 4.368 Studio Seminar in Public Art/Public Space (SP, 12 units, HASS-A)

Building Technology (BT)

• 4.411 D-LAB Schools: Building Technology Laboratory (FA, Lab, 12 units)
• 4.432 Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods (SP, 12 units)
• 4.451 Computational Structural Design and Optimization (FA, 12 units)

Computation

• 4.501 Tiny Fab: Advanced Applications in Digital Fabrication (SP, 12 units)
• 4.502 Advanced Visualization: Architecture in Motion Graphics (FA, 12 units)
• 4.520 Visual Computing 1 (FA, 12 units)

History, Theory, and Criticism of Architecture, Art, and Design (HTC)

• 4.601 Introduction to Art History (FA, 12 units, HASS-A)
• 4.602 Modern Art and Mass Culture (SP, 12 units, HASS-A)
• 4.605 A Global History of Architecture (SP, 12 units, HASS-A)
• 4.609 Seminar in the History of Art and Architecture (SP, 12 units, HASS-A)
• 4.614 Building Islam (FA, 12 units, HASS-A)
• 4.635 Early Modern Architecture and Art (FA, 12 units, HASS-A)
• 4.636 Topics in European Medieval Architecture and Art (FA, 12 units, HASS-A)
• 4.651 Art Since 1940 (SP, 12 units, HASS-A)
• 4.657 The History of Making Things (SP, 12 units, CI-H, HASS-A)

Architecture Studios

Design studios are at the heart of architecture education, and MIT offers a broad range of studios devoted to design projects of increasing complexity.

Architecture Design majors take five studios sequentially. The maximum size of the 4.023, 4.024, and 4.025 studio sections is 12 students. The final studio (4.025) is optional and can be substituted with two subjects chosen from the list of restricted elective classes.

4.021 or 4.02A Design Studio: How to Design
12 units, fall and Spring; 9 units, IAP, Hass-A
Introduces fundamental design principles as a way to demystify design and provide a basic introduction to all aspects of the design process. Through lectures and weekly exercises, students will develop their skills and enable creativity, abstract thinking, representation, iteration and design development. An introductory class intended for students without a design background geared towards enabling more effective collaboration with designers and the ability to apply the foundations of design to any discipline. Limited to 25; preference to Course 4 and 4B majors and Design and Architecture minors, and first- and second-year students.

4.022 Design Studio: Introduction to Design Techniques and Technologies
12 units, Fall and spring, prereq: 4.021 or 4.021A
Introduces the tools, techniques and technologies of design across a range of projects in a studio environment. The class will explore concepts related to form, function, materials, tools, and physical environments through project-based exercises. Develops familiarity with design process, critical observation, and the translation of design concepts into digital and physical reality. Utilizing traditional and contemporary design techniques and tools, faculty across various design disciplines expose students to a unique cross-section of inquiry. Limited to 25; preference to Course 4 and 4B majors and Design and Architecture minors.

4.023 Architecture Design Studio 1
24 units, fall, CI-M, prereq: 4.022
The first advanced design studio provides instruction in architectural design and project development within design constraints including architectural program and site. Students engage the design process through various two-dimensional and three-dimensional media. Working directly with representational and model making techniques, students gain experience in the conceptual, formal, spatial and material aspects of architecture. Instruction and practice in oral and written communication provided. Preference is given to Course 4 Majors and Minors.

4.024 Architecture Design Studio 2

24 units, Spring, preq: 4.023, 4.401, 4.500,

The second advanced studio provides instruction in architectural design and project development with an emphasis on social, cultural, or civic programs. The studio builds upon the foundational design skills with more complex constraints and context and integrates aspects of architectural theory, building technology, and computation into the design process. Preference is given to Course 4 Majors and Minors.

4.025 Architecture Design Studio 3 (Optional)

24 units, Fall, preq: 4.024, 4.440

The final, optional design studio provides instruction in more advanced architectural design projects. Students develop integrated design skills as they negotiate the complex issues of program, site, and form in a specific cultural context. The studio focuses on how architectural concepts and ideas translate into built environments that transform the public sphere. It is designed to prepare students for graduate studies in the field. Preference is given to Course 4 Majors.

Eligibility Requirements for Studio & Minimum Grade Requirements

Course 4 Majors take studios 4.021 - 4.025 sequentially. Students' names must appear on the studio eligibility lists to ensure participation. This list is posted on-line prior to Registration Day. Students should notify the department degree administrators if they believe there is an error in their status.
Promotion from one studio to the next is not automatic. Grades lower than "C" will jeopardize advancement in the architecture design studio sequence. Advancement eligibility rules ensure that students who enter advanced studios are well prepared.

Transferring into Architecture

No Course 4 undergraduate who enters the Department as a sophomore or first term Junior and is performing well should have to spend an extra semester at MIT to complete the program. Students who transfer into the Department may complete the degree on time by substituting the final studio, 4.025, with two restricted electives.

Course 4B Curriculum

Bachelor of Science in Art and Design (BSAD)

The Bachelor of Science in Art and Design (BSAD) provides a rigorous but flexible program of study in which students learn fundamental principles of art and design and purse an area of concentration across a spectrum of possibilities. The curriculum is strongly rooted in MIT's "mens et manus," or mind and hand, ethos. It offers a rigorous conceptual foundation along with strong practical skills that can be applied across diverse design domains.

In studios, students are introduced to the design process from concept to completion — through critical thinking, experimentation, and representation and physical production techniques. Studio-based learning is complemented by seminars and lecture subjects which situate design within diverse historical, cultural, social, and technological contexts. Art and design are taught as context dependent, beyond the narrow requirements of the artifacts to be designed, and as a means for interrogating the dynamics of society and culture in relation to the user.

The objective of this program is to prepare students to pursue diverse career paths in multiple areas of art and design from product design to visual communication to information design to 2D and 3D art practices and more. It enables graduates to take advantage of the many emerging design and art opportunities in industry and academia.

The degree is granted once all 17 General Institute Requirements (GIR) and departmental requirements of 180 units have been met.

Required Design Studios (33-36 units)

- 4.021 Design Studio: How to Design (FA/SP, HASS-A, 12 units) or
4.02A Design Studio: How to Design Intensive (IAP, HASS-A, 9 units)
- 4.022 Design Studio: Introduction to Design Techniques and Technologies
(FA/SP, 12 units, prereq., 4.021)
- 4.031 *Design Studio: Objects and Interaction (FA, 12 units, prereq., 4.022) or
4.032 *Design Studio: Information and Visualization (SP, 12 unit, prereq., 4.022)

Foundation Subjects (48 units)

- 4.110 Design Across Scales and Disciplines (SP, HASS-A, 12 units)
- 4.302 Foundations in Art, Design, and Spatial Practices
(SP, HASS-A, CI-M, 12 units)
- 4.500 Design Computing: Art, Objects and Space (FA, 12 units)
- 4.657 Design: The History of Making Things (SP, HASS-A, CI-H, 12 units)

Thesis Subjects (24 units)

- 4.THT J/11.THT J Thesis Research Design Seminar (FA, CI-M, 12 units)
- 4.THU Undergraduate Thesis (SP, 12 units, prereq: 4.THTJ)

Restricted Electives: Select 48 units from among any of the 3 categories below.

Objects

- 4.031 *Design Studio: Objects and Interaction (FA, 12 units, prereq., 4.022)
- 4.041 Design Studio: Advanced Product Design (SP, 12 units, prereq., 4.031)
- 4.043 Design Studios: Advanced Interaction (SP, 12 units, prereq., 4.031)
- 4.118 Creative Computing (SP, 12 units, prereq: 4.500)
- 4.125 Furniture Making Workshop (FA, 9 units)
- 4.451 Computational Structural Design & Optimization
(FA, 12 units, prereq., 4.440 or 2.001 or 1.050 and 6.0001 & 6.0002 or 1.000)
- 4.501 Advanced Design Projects in Digital Fabrication
(SP, 12 units, prereq., 4.500)
- 2.00A Fundamentals of Engineering Design: Explore Space, Sea & Earth
(9 units)
- 2.00 Introduction to Design (6 units)
- 2.007 Design and Manufacturing I (12 units)
- 2.009 The Product Engineering Process (12 units)
- EC.720 J, 2.722 J D-Lab: Design (12 units)
- MAS.377 Objectifications: How to Write (& Talk, & Think) about Objects
(HASS-H, 9 units)

Information

- 4.032 *Design Studio: Information & Visualization (SP, 12 units, prereq., 4.022)
- 4.051 The Human Factor in Innovation and Design Strategy (FA, 12 units)
- 4.053 Visual Communications Fundamentals (FA, 12 units)
- 4.502 Advanced Visualization: Architecture in Motion Graphics
(FA, 12 units, prereq., 4.500)
- 4.520 Visual Computing 1 (FA, 12 units)
- CMS.405 Visual Design (HASS-H, 12 units)
- CMS.622 Applying Media Technologies in the Arts and Humanities
(HASS-A, 12 units)
- CMS.633 Digital Humanities I: Topics, Techniques, and Technologies
(HASS-H, 12 units)

Art & Experience

- 4.301 Introduction to Artistic Experimentation (FA/SP, HASS-A, 12 units)
- 4.307 Art, Architecture and Urbanism in Dialogue
(FA, HASS-A, 12 units, prereq: 4.301 or 4.302)
- 4.320 Introduction to Sound Creations (FA, HASS-A, 12 units)
- 4.322 Introduction to Three-Dimensional Art Work (FA, HASS-A, 12 units)
- 4.341 Introduction to Photography and Related Media (FA, HASS-A, 12 units)
- 4.354 Introduction to Video and Related Media (FA, HASS-A, 12 units)
- 4.602 Modern Art and Mass Culture (SP, HASS-A, 12 units)
- 21M.603 Introduction to Design for the Theater (HASS-A, 9 units)
- CMS.362 Civic Media Collaborative Design Studio (HASS-S, 12 units)
- CMS.634 Designing Interactions (HASS-E, 12 units)

*Either 4.031 or 4.032 may be used as a restricted elective if not selected as part of the design studio requirement.

Design Studios and Foundational Subjects

Design studios are the heart of an architectural education. MIT offers a broad range of studios devoted to design projects of increasing complexity. Architecture majors take five studios sequentially. The maximum size of the 4.023, 4.024, and 4.025 studio sections is 12 students. The fifth studio is optional and can be substituted with two subjects chosen from the list of restricted elective classes.

4.021 or 4.02A Design Studio: How to Design
Fall and Spring, Hass-A, 2 units, IAP, 9 units
Introduces fundamental design principles as a way to demystify design and provide a basic introduction to all aspects of the design process. Through lectures and weekly exercises, students will develop their skills and enable creativity, abstract thinking, representation, iteration and design development. An introductory class intended for students without a design background geared towards enabling more effective collaboration with designers and the ability to apply the foundations of design to any discipline. Limited to 25; preference to Course 4 and 4B majors and Design and Architecture minors, and first- and second-year students.

4.022 Design Studio: Introduction to Design Techniques and Technologies
Fall and Spring, 12 units, preq: 4.021 or 4.021A
Introduces the tools, techniques and technologies of design across a range of projects in a studio environment. The class will explore concepts related to form, function, materials, tools, and physical environments through project-based exercises. Develops familiarity with design process, critical observation, and the translation of design concepts into digital and physical reality. Utilizing traditional and contemporary design techniques and tools, faculty across various design disciplines expose students to a unique cross-section of inquiry. Limited to 25; preference to Course 4 and 4B majors and Design and Architecture minors, and first- and second-year students.

Choice of either 4.031 or 4.032:

4.031 Design Studio: Objects and Interaction
Fall, 12 units, preq: 4.022
Overview of design as the giving of form, order, and interactivity to the objects that define our daily life. Follows the path from project to interactive product. Covers the overall design process, preparing students for work in a hands-on studio learning environment. Emphasizes design development and constraints. Topics include the analysis of objects: interaction design and user experience; design methodologies, current dialogues in design; economies of scale vs. means; and

role of technology in design. Provides a foundation in prototyping skills such as carpentry, casting, digital fabrication, electronics, and coding. Limited to 15; preference to Course 4B majors and Design Minors.

4.032 Design Studio: Information and Visualization
Spring, 12 units, preq: 4.022

Provides and introduction to working with information, data and visualization in a hands-on studio learning environment. Studies the history and theory of information, followed by a series of projects in which students apply the ideas directly. Progresses through basic data analysis, visual design and presentation, and more sophisticated interaction techniques. Topics include storytelling and narrative, choosing representations, understanding audiences, and the role of designers working with data. Limited to 25; Preference to Course 4B majors and Design Minors.

4.110 Design Across Scales and Disciplines
Spring, HASS-A, 12 units,

Inspired by Charles and Ray Eames' canonical Power of Ten, explores the relationship between science and engineering through the lens of design. Examines how transformations in science and technology have influenced design thinking and vice versa. Provides interdisciplinary skills and methods to represent, model, design and fabricate objects, machines, and systems using new computational and fabrication tools. Aims to develop methodologies for design research of interdisciplinary problems. Additional work required of students taking the graduate version of the subject. Enrollment limited; preference to Course 4B majors and Design and Architecture minors.

4.302 Foundations in Art, Design, and Spatial Practices
Spring, CI-M, 12 units, , preq: 4.02A pr 4.021

Offers a foundation in artistic practice and its critical analysis. Emphasizes the development of artistic approaches and methods and their analogies to architectural thinking and design practice. Develops skills in how to communicate ideas and experiences through two-dimensional, three-dimensional, time-based media, and through new genres. This includes engaging in spatial, sculptural, performative and process-oriented artistic methods. Video screenings, guest lectures, visiting artist presentations, field trips, and readings supplement studio practice. Instruction and practice in written and oral communication provided. Lab fee. Preference to Course 4 and 4B majors.

4.500 Design Computing: Art, Objects and Space

Fall, 12 units

Introduces 3-D CAD modeling to students with little or no experience in design or computation. Teaches surface, solid and mesh modeling techniques combined with a variety of modeling assignments leading up to a final project. Additional work required of students taking the graduate version. Enrollment limited preference to Course 4 and 4B majors and Design and Architecture minors. Lab fee.

4.657 Design: The History of Making Things

Spring, HASS-A, CI-H, 12 units

Examines themes in the history of design, with emphasis on Euro-American theory and practice in their global contexts. Addresses the historical design of communications, objects, and environments as meaningful processes of decision-making, adaptation, and innovation. Critically asses the dynamic interaction of design with politics, economics, technology, and culture in the past and at present. Limited to 36.

Senior Thesis

The senior thesis allows students to culminate their education with a challenge that demands advanced work and rewards them with portfolio material, research documents, and developed viewpoints on a topic of important. It is required for Course 4B. It is optional for the Course 4 and will be used to fulfill 12 units of unrestricted electives.

The nature of the work must be an original research or design project that involves additional learning of a substantive nature. The work must be documented with a written thesis completed to Institute specifications within the final term of the senior year. The final document is archived within the MIT library and can be submitted to DSpace.

Thesis preparation subjects are taken the fall prior to registering for thesis and will assist students in preparing a thesis proposal and choosing a supervisor.

• 4.119 Preparation for Undergraduate Architecture Design Thesis, a 12-unit class, is for students wishing to focus on an optional design thesis.
• 4.THTJ Thesis Research Design Seminar, a 12-unit, CI-M class is for BSA and BSAD students wishing to focus on a research thesis. It is jointly offered with DUSP 11.THTJ.

Both subjects are taken the fall prior to registering for thesis and will assist students in preparing a proposal and choosing a supervisor. Students may not enroll in Thesis (4.THU) without completing a thesis preparation subject.

The thesis supervisor may be a faculty member, lecturer, visiting faculty, or research scientist from within Course 4 or from another department within MIT. If chosen from a department other than Architecture, a faculty member within Course 4 willing to work in conjunction with the supervisor must be added to the proposal as a reader. No additional readers are required.

Upon satisfactory completion of the thesis, the supervisor will assign a grade. The grade will not be submitted to the Registrar until a copy of the final signed thesis document is submitted to the undergraduate administrator in Headquarters by the published thesis deadline. Thesis presentations will be scheduled at the end of the spring term in coordination with graduate reviews.
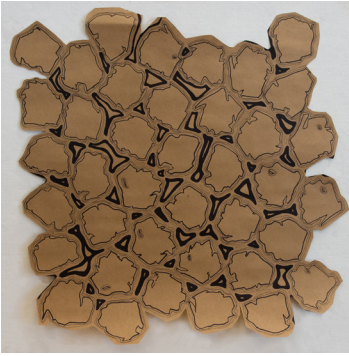
4.021 & 4.02A Introduce fundamental design principles as a way to demystify design and provide a basic introduction to all aspects of the design process. Through lectures and weekly exercises, students develop their skills, enable creativity, abstract thinking, representation, iteration, and design development.

4.021 & 4.02A "How to Design" are introductory classes appropriate for students with and without a design background and are geared towards enabling more effective collaboration between students. 4.021 & 4.02A equip students with the ability to apply foundational design principals and the design process to any discipline. Limited to 25; preference to Course 4 and 4B majors, Design and Architecture minors, and first- and second-year students.
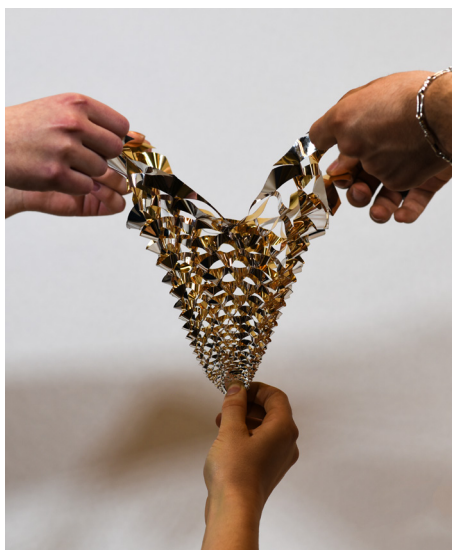
4.022 Design Studio: Introduction to Design Techniques and Technologies
Introduces the tools, techniques and technologies of design across a range
of projects in a studio environment. 4.022 explores concepts related to form,
function, materials, tools, and physical environments through project-based
exercises. 4.022 develops familiarity with the design process, critical observation,
and the translation of design concepts into digital and physical reality. Utilizing
traditional and contemporary design techniques and tools, faculty across various
design disciplines expose students to a unique cross-section of inquiry. Limited to
25, preference to Design and Architecture majors, Design and Architecture minors,
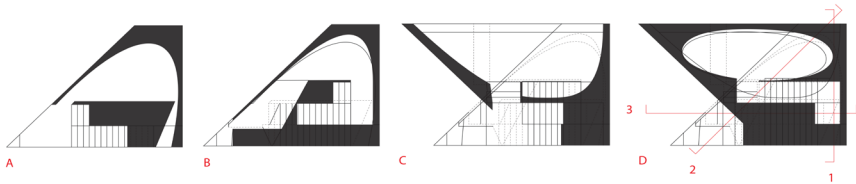and first- and second-year students.
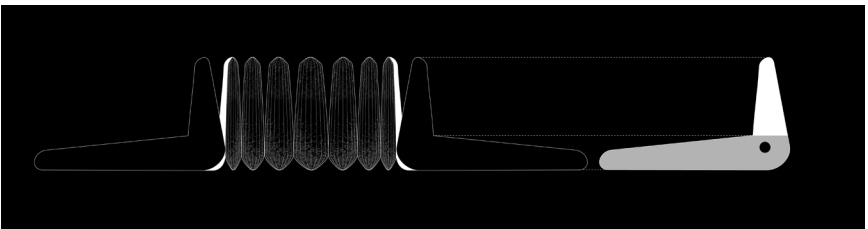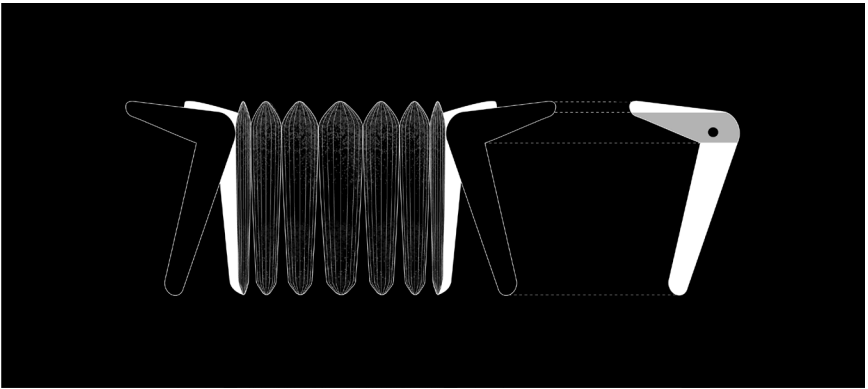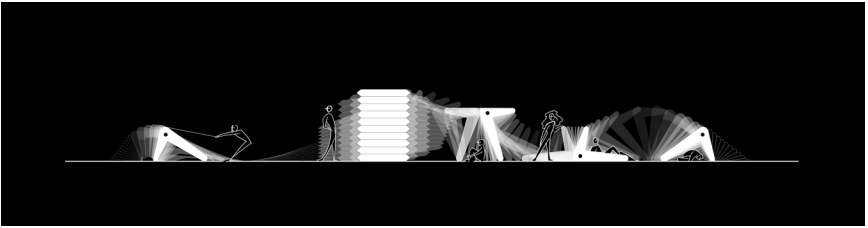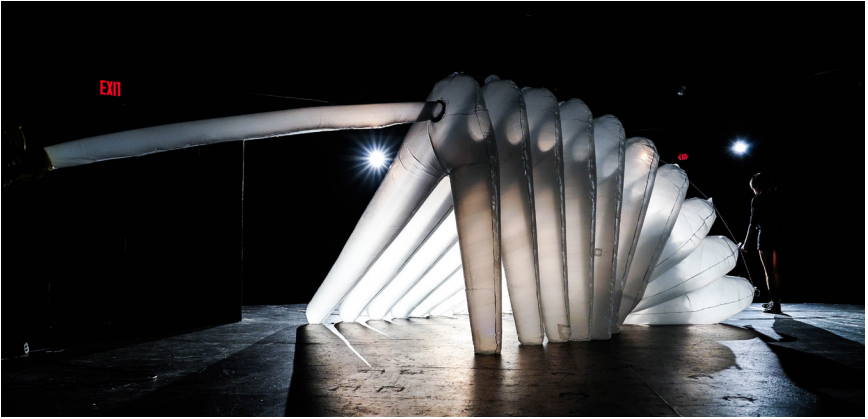
4500 Design Computation: Art, Objects and Space introduces undergraduate, course fou
of foundational technologies weekly, this includes 3D printing, Computer Generated Renc
each exercise. Although the medium for the course is centered on computer modeling, app
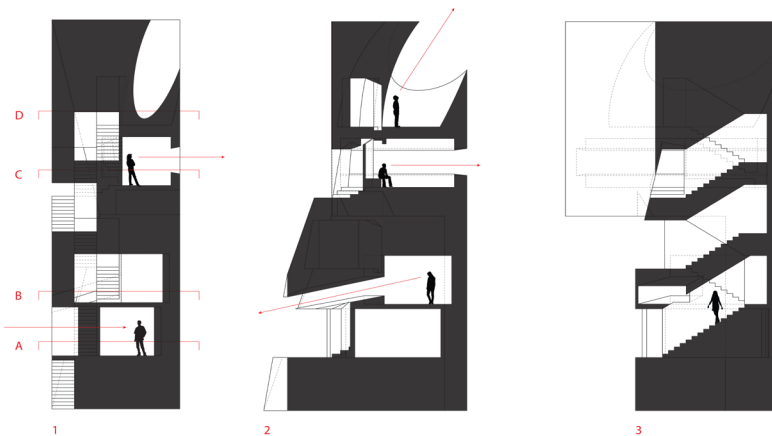Students work on one project throughout the term starting with a deep

r majors and minors design and computation through application. 4.500 explores an array
lering and CNC technologies. Students also learn to establish design principles as part of
lication is guided by weekly design exercises, student presentations, and faculty feedback.
product analysis, ending with a useful, well designed physical artifact.

PLANS

A   B   C   D

3   2   1

SECTIONS

D
C
B
A

1   2   3

COMPARTMENTS AND CIRCULATION

Circulation

ROOM4
Sky View

ROOM3
Horizon View

ROOM1
Indirect Lighting

ROOM2
Gound View

28

GALLERY   LOBBY/INSTALLATION   CAFE   LECTURE HALL   OFFICES
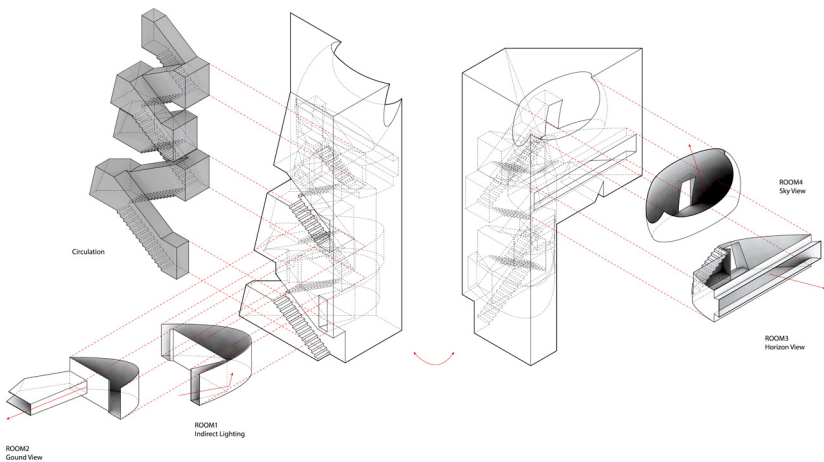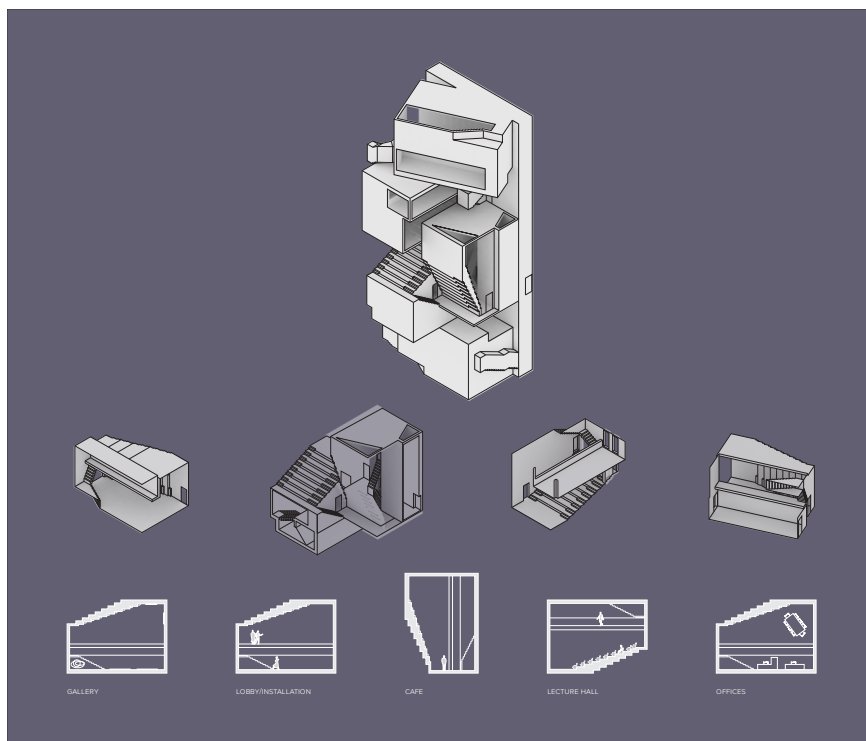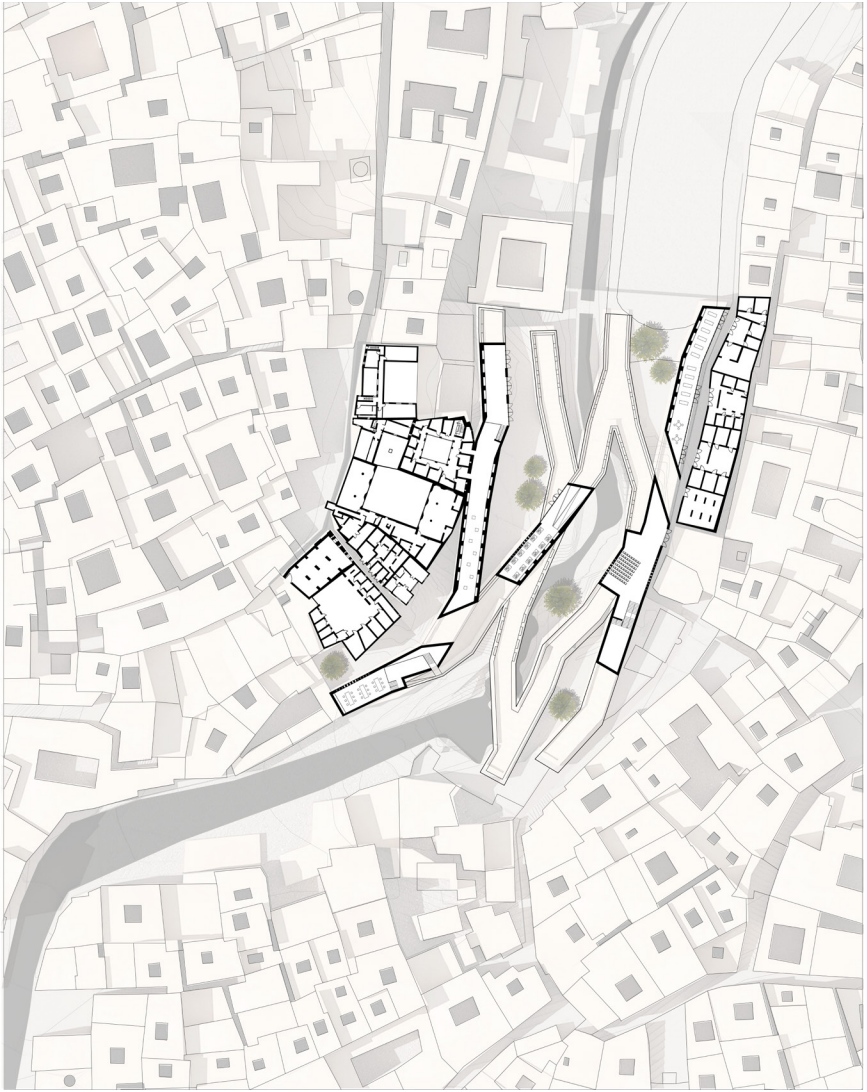

4.023 Architecture Studio 1 provides instruction in architectural design and project development within design constraints including architectural program and site. Students engage the design process through various 2-dimensional and 3-dimensional media. Working directly with analog and digital representational and model making techniques, students gain experience in the conceptual, formal, spatial and material aspects of architecture. Instruction and practice in oral and written communication provided. Preference is given to Course 4 Majors and Minors.
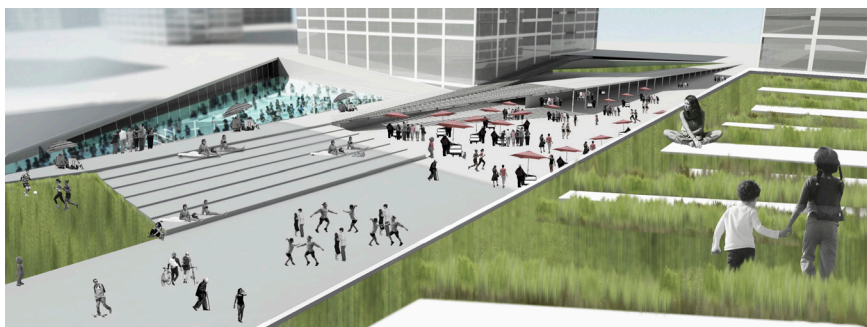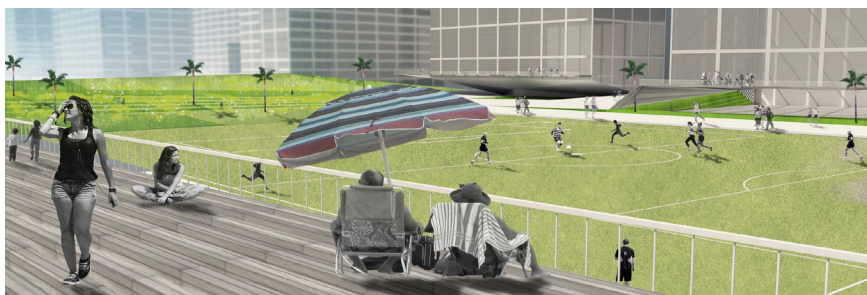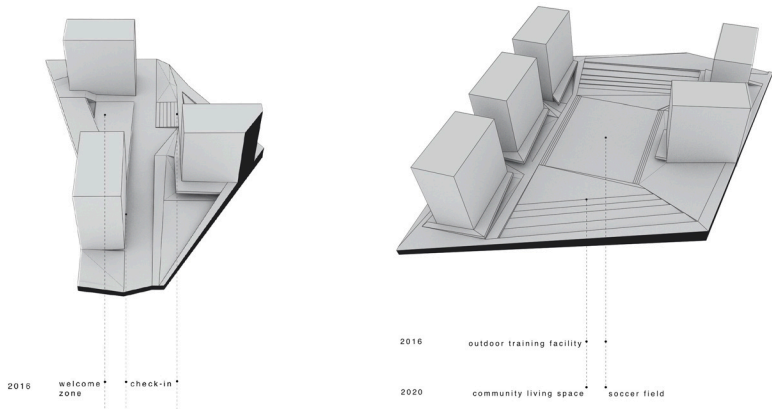
4.025 Architecture Design Studio 3 (Optional) final, design studio provides instruction in more advanced architectural design projects. Students develop integrated design skills as they negotiate the complex issues of program, site, and form in a specific cultural context. The studio focuses on how architectural concepts and ideas translate into built environments that transform the public sphere. It is designed to prepare students for graduate studies in the field. Preference is given to Course 4 Majors.

The senior thesis allows students to culminate their education with a challenge that demands advanced work and rewards them with portfolio material, research documents, and developed viewpoints on a topic of importance. The nature of the work must be an original research or design project that involves additional learning of a substantive nature. The work must be documented with a written thesis completed to Institute specifications within the final term of the senior year. The final document is archived within the MIT library and can be submitted to DSpace. Thesis preparation subjects are taken the fall prior to registering for thesis and will assist students in preparing a thesis proposal and choosing a supervisor.
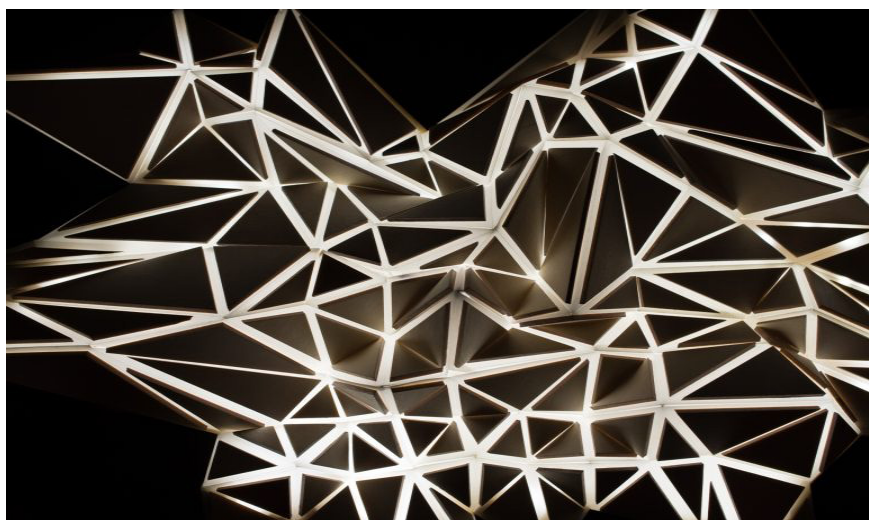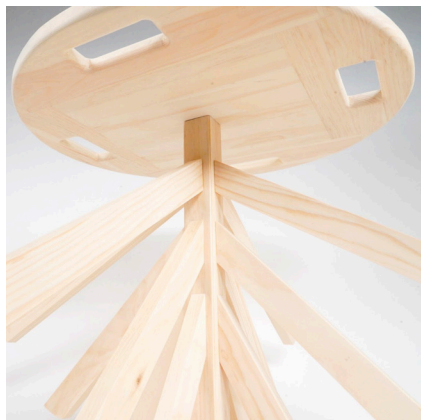
4.031 Design Studio: Objects and Interactions is an overview of design as the giving of form, order, and interactivity to the objects that define our daily life. 4.031 follows the path from project to interactive product. 4.031 covers the overall design process, preparing students for work in a hands-on studio learning environment emphasizing design development and constraints. Topics include the analysis of objects: interaction design and user experience; design methodologies, current dialogues in design; economies of scale vs. means; and role of technology in design. 4.031 provides a foundation in prototyping skills such as carpentry, casting, digital fabrication, electronics, and coding. Limited to 15; preference to Course 4B majors and Design Minors.

NOT ENOUGH LAND

A Collection of Land Reclamation Projects in China

Coastal land reclamation has been a major source of development land in China in recent years. This project looks into the range of land reclamation projects in China and their change over time.

Location:
Shanghai, Shanhai
Water Body:
Yangtze River Delta
Area:
315.6 sqkm
Investment:
27 billion Yuan
Planned Population:
800,000
Land Uses:
Administration, Office, Residential, Commercial, Tourism, Technology&Innovation
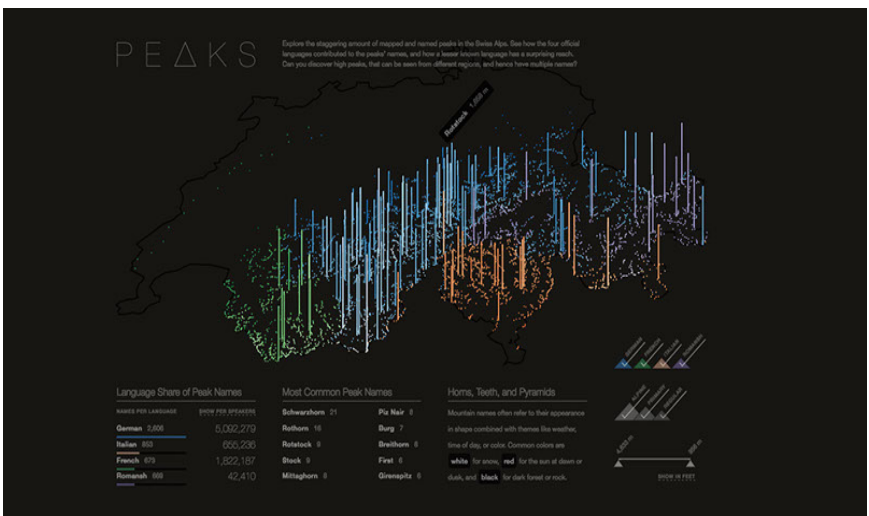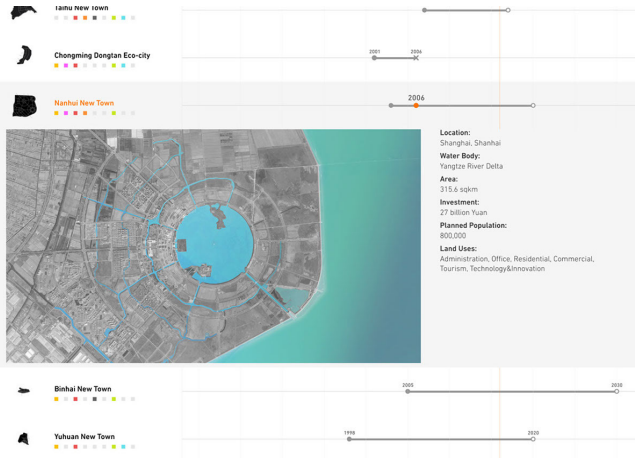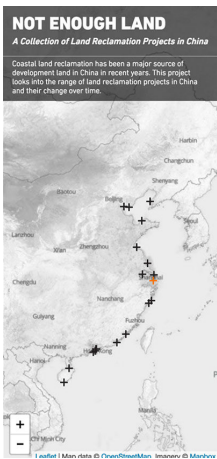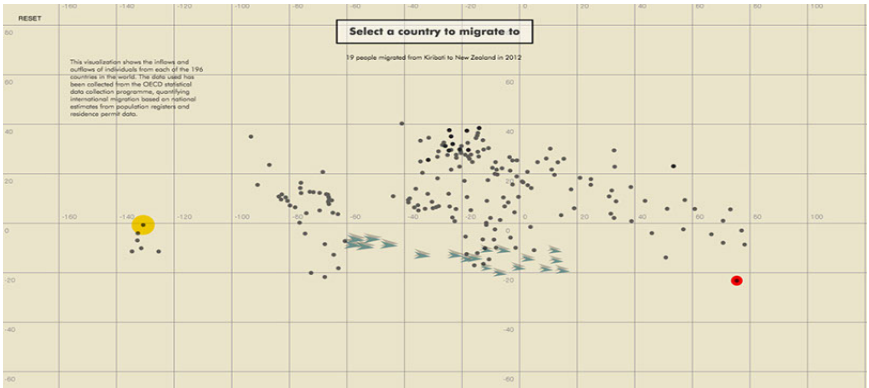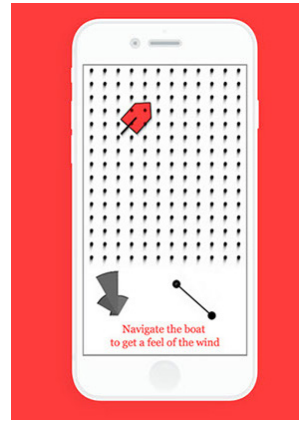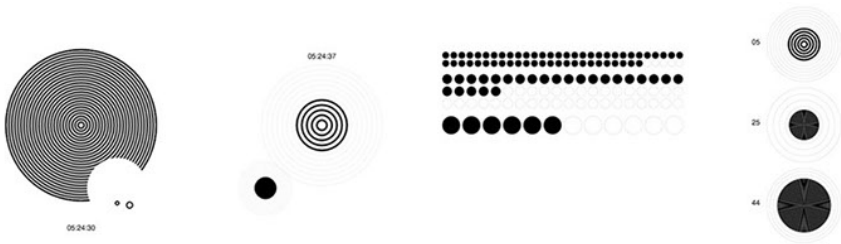
4.032 Design Studio: Information and Visualization provides and introduction to working with information, data and visualization in a hands-on studio learning environment. 4.032 studies the history and theory of information, followed by a series of projects in which students apply the ideas directly. 4.032 progresses through basic data analysis, visual design and presentation, and more sophisticated interaction techniques. Topics include storytelling and narrative, choosing representations, understanding audiences, and the role of designers working with data. Limited to 25; Preference to Course 4B majors and Design Minors.

4.041 Design Studio: Advanced Product Design focuses on producing a small series of manufactured products. Students develop products that address specific user needs, propose novel design concepts, iteratively prototype, test functionality, and ultimately exhibit their work in a retail context. Stemming from new research and technological developments around MIT, students try to imagine the future products that emerge from new materials and machine intelligence. Provides an in-depth exploration of the design and manufacturing of products, through narrative, form, function, fabrication, and their relationship to customers.

Course 4 Minors

The Architecture Department offers four minors

• Design
Minor Advisor — terry knight · 7-304 · 452-2922 · tknight@mit.edu

• Architecture
Minor Advisor — Les Norford · 5-418 · 253-8797 · lnorford@mit.edu

• History of Architecture, Art and Design (HASS)
Minor Advisor — Lauren jacobi · 3-305 · 253-7572 · jacobi@mit.edu

• Art, Culture and Technology (HASS)
Minor Advisor — Gediminas Urbonas · E15-238 · 324-6471 · urbonas@mit.edu

The Minor in Design provides a cohesive program of study that exposes students to the cross-disciplinary field of design. It provides a rigorous conceptual foundation in design along with strong design skills. Gives an introduction to design from concept to completion through contextual critical thinking, experimentation representation, and physical production techniques, critique, iteration and reflection.

The Minor in Architecture is designed to give students a foundation in the multidisciplinary study of the built environment. The minor allows students to pursue a focused program of study across the architecture department's diverse discipline groups.

The HASS Minor in the History of Architecture, Art and Design is designed to enable students to concentrate on the historical, theoretical, and critical issues associated with artistic and architectural production.

The HASS Minor in Art, Culture and Technology is designed for students interested in hands-on artistic practice and critical debate.

The HASS Minor is often an extension of the HASS concentration available in each of these disciplines. Students who successfully complete a minor program will have the field of study specified on their student transcript, thus giving recognition of focused work in the discipline. For more information on HASS Minors, visit SHASS.MIT.EDU/UNDERGRADUATE/MINORS.

Minor in Design

Take three subjects from Group 1 and three subjects from Group 2.

Group 1 — Take 3 subjects

• 4.021, Design Studio: How to Design (FA & SP, HASS-A, 12 units) <u>or</u>
4.02A, Design Studio: How to Design Intensive (IAP, HASS-A, 9 units)
• 4.022, Design Studio: Introduction to Design Techniques and Technologies
(FA & SP, 12 units, prereq., 4.021)
• 4.031, Design Studio: Objects and Interaction (FA, 12 units, prereq., 4.022) <u>or</u>
4.032, Design Studio: Information and Visualization (SP, 12 unit, prereq., 4.022)

Group 2 — Take 3 subjects

Objects

• 2.00A Fundamentals of Engineering Design: Explore Space, Sea & Earth
(9 units)
• 2.00 Introduction to Design (1/2 term, 6 units)
• 2.007 Design and Manufacturing (12 units)
• 2.009 The Product Engineering Process (12 units)
• 4.031 Design Studio: Objects and Interaction (if not used above) (FA, 12 units,
prereq., 4.022)
• 4.041 Design Studio: Advanced Product Design (SP, 12 units, prereq., 4.031)
• 4.043 Design Studio: Advanced Interactions (SP, 12 units, prereq., 4.031)
• 4.110 Design Across Scales and Disciplines (SP, HASS-A, 12 units)
• 4.118 Creative Computing (SP, 12 units, prereq., 4.500)
• 4.125 Furniture Making Workshop (FA, 9 units)
• 4.451 Computational Structural Design & Optimization (FA, 12 units, prereq.,
4.440 or 2.001 or 1.050 <u>and</u> 6.0001 & 6.0002 or 1.000)
• 4.501 Advanced Design Projects in Digital Fabrication (SP, 12 units, prereq.,
4.500)
• 4.657 Design: The History of Making Thing (SP, HASS-A, CI-H, 12 units)
• EC.720J D-Lab: Design (12 units)
• MAS.377 Objectification: How to Write (and Talk, and think) About Objects
(HASS-H, 9 units)

Information

- 4.032 Design Studio: Information and Visualization (if not used above) (SP, 12 units, prereq., 4.022)
- 4.051 The Human Factor in Innovation and Design Strategy (FA, 12 units)
- 4.053 Visual Communication Fundamentals (FA, 12 units)
- 4.500 Design Computing: Art, Objects and Space (FA, 12 units)
- 4.502 Advanced Visualization: Architecture in Motion Graphics (FA, 12 units, prereq: 4.500)
- 4.520 Visual Computing (FA, 12 units)
- CMS.405 Visual Design (HASS-H, 12 units)
- CMS.622 Applying Media Technologies in the Arts and Humanities (HASS-A, 12 units)
- CMS.633 Digital Humanities: Topics, Techniques, and Technologies (HASS-H, 12 units)
- MAS.110 Fundamentals of Computational Media Design (HASS-A, CI-H, 12 units)

Art and Experience

- 4.301 Introduction to Artistic Experimentation (FA/SP, HASS-A, 12 units)
- 4.302 Foundations in Art, Design, and Spatial Practices (SP, CI-M, 12 units)
- 4.307 Art, Architecture and Urbanism in Dialogue (FA, HASS-A, 12 units, prereq: 4.301 or 4.302)
- 4.320 Introduction to Sound Creations (FA, HASS-A, 12 units)
- 4.322 Introduction to 3-D Art Work (FA, HASS-A, 12 units)
- 4.341 Introduction to Photography & Related Media (FA, HASS-A, 12 units)
- 4.354 Intro to Video & Related Media (FA, HASS-A, 12 units)
- 4.602 Modern Art & Mass Culture (SP, HASS-A, 12 units)
- 21M.603 Intro to Design for the Theatre (HASS-A, 9 units)
- CMS. 362 Civic Media Collaborative Design Studio (HASS-S, 12 units)
- CMS.634J Designing Interactions (HASS-E, 12 units)

Total for Minor in Design = 6 subjects

Minor in Architecture

Take the two required subjects, then follow Option 1 or 2:

• 4.021 Design Studio: How to Design (FA/SP, HASS-A, 12 units) <u>or</u>
4.02A Design Studio: How to Design Intensive (IAP, HASS-A, 9 units)
• 4.022 Design Studio: Introduction to Design Techniques and Technologies
(FA/SP, 12 units, preq., 4.021 or 4.02A)

Option 1 — Take 3 subjects

• 4.023 Architecture Design Studio 1 (FA, CI-M, 24 units, preq., 4.022)
• Plus two subjects from the following list of electives

Option 2 — Choose 4 subjects from the following list of electives

Architecture and Urbanism

• 4.211J The Once and Future City (SP, CI-H, 12 units)
• 4.218   Disaster Resilient Design (FA, 12 units)
• 4.231   SIGUS Workshop (FA, units arranged)
• 4.250J Introduction to Urban Design and Development (FA, HASS-A, 12 units)

Art, Culture and Technology

• 4.301 Introduction to Artistic Experimentation (FA/SP, HASS-A, 12 units)
• 4.302 Foundations in Art, Design, and Spatial Practices (SP, 12 units)
• 4.307 Art, Architecture and Urbanism in Dialogue (FA, HASS-A, 12 units)
• 4.322 Introduction to Three-Dimensional Artwork (FA, HASS-A, 12 units)
• 4.341 Introduction to Photography & Related Media (FA/SP, HASS-A, 12 units)
• 4.368 Studio Seminar in Art and the Public Sphere (SP, HASS-A, 12 units)

Building Technology

• 4.401 Environmental Technologies in Buildings (FA, 12 units)
• 4.411J D-Lab Schools: Building Technology Laboratory (SP, Lab, 12 units)
• 4.432 Modeling Urban Energy Flows for Sustainable Cities & Neighborhoods
(SP, 12 units)
• 4.440J Introduction to Structural Design (SP, REST, 12 units; preq., 18.02)
• 4.451 Computational Structural Design and Optimization (FA, 12 units)

Computation

- 4.500 Design Computation: Art, Objects and Space (FA, 12 units)
- 4.501 Advanced Design Projects in Digital Fabrication (SP, 12 units)
- 4.502 Advanced Visualization: Architecture in Motion Graphics (FA, 12 units)

History and Theory of Architecture, Art, and Design

- 4.603 Understanding Modern Architecture (FA, HASS-A, 12 units)
- 4.605 A Global History of Architecture (SP, HASS-A, 12 units)
- 4.609 Seminar in the History of Art and Architecture (SP, HASS-A, 12 units)
- 4.614 Building Islam (FA, HASS-A, 12 units)
- 4.635 Early Modern Architecture and Art (FA, HASS-A, 12 units)
- 4.636 Topics in European Medieval Architecture and Art (FA, HASS-A, 12 units)

Total for Minor in Architecture = 5 or 6 subjects

Minor: History of Architecture, Art & Design (HASS) Minor

The program consists of six subjects arranged into three levels of study. Two are taken from Group 1, three from Group 2, and one from Group 3.

Group 1 (Take 2 subjects)

History of Architecture (Choose one subject)

- 4.605 A Global History of Architecture (SP, HASS-A, 12 units)
- 4.614 Building Islam (FA, HASS-A, 12 units)

History of Art (Choose one subject)

- 4.601 Introduction to Art History (FA, HASS-A, 12 units)
- 4.602 Modern Art and Mass Culture (SP, HASS-A, 12 units)

Group 2 (Take 3 subjects)

History of Architecture and Design

- 4.603 Understanding Modern Architecture (FA, HASS-A, 12 units)
- 4.622 Islamic Gardens and Geographies (SP, HASS-A, 12 units)
- 4.657 Design: The History of Making Things (SP, , CI-H, HASS-A, 12 units)

History of Art

- 4.635 Early Modern Architecture and Art (FA, HASS-A, 12 units)
- 4.636 Topics in European Medieval Architecture and Art (FA, HASS-A, 12 units)
- 4.641 19th-Century Art: Painting in the Age of Steam (FA, HASS-A, 12 units)
- 4.651 Art Since 1940 (SP, HASS-A, 12 units)

Group 3 (Take 1 subject)

- 4.609 Seminar in History of Art and Architecture (or other advanced seminars with permission of the Minor Advisor; also, selected courses at Harvard and Wellesley) (SP, HASS-A, 12 units)

Total for Minor in History of Architecture & Art = 6 subjects

Minor: Art, Culture & Technology (HASS) Minor

The ACT program consists of six subjects arranged into three levels of study. Two subjects are taken from each group.

Group 1 - Take 2 subjects

• 4.301 Introduction to Artistic Experimentation (FA/SP, HASS-A, 12 units) <u>or</u> 4.302 Foundations in Art, Design, and Spatial Practices (SP, HASS-A, CI-M, 12 units)

and one from the following list:

• 4.601 Introduction to Art History (FA, HASS-A, 12 units)
• 4.602 Modern Art and Mass Culture (SP, HASS-A, 12 units)
• 4.635 Early Modern Architecture and Art (FA, HASS-A, 12 units)
• 4.636 Topics in European Medieval Architecture and Art (FA, HASS-A, 12 units)
• 4.641 19th-Century Art: Painting in the Age of Steam (FA, HASS-A, 12 units)
• 4.651 Art Since 1940 (SP, HASS-A, 12 units)
• 4.657 Design: The History of Making Things (SP, CI-H, HASS-A, 12 units)

Group 2 - Take 2 subjects

• 4.320 Introduction to Sound Creations (FA, HASS-A, 12 units)
• 4.322 Introduction to Three-Dimensional Art Work (FA, HASS-A, 12 units)
• 4.341 Introduction to Photography and Media (FA/SP, HASS-A, 12 units)
• 4.354 Introduction to Video and Related Media (FA/SP, HASS-A, 12 units)

Group 3 - Take 2 subjects

• 4.314 Advanced Workshop in Artistic Practice and Trans-disciplinary Research (FA, HASS-A, 12 units)
• 4.344 Advanced Photography and Related Media (FA/SP, HASS-A, 12 units)
• 4.352 Advanced Video and Related Media (FA/SP, HASS-A, 12 units)
• 4.356 Cinematic Migrations (SP, HASS-A, 12 units)
• 4.361 Performance Art Workshop (SP, HASS-A, 12 units)
• 4.368 Studio Seminar in Public Art/Public Space (SP, HASS-A, 12 units)
• 4.373 Advanced Projects in Visual Arts (FA/SP, HASS-A, 12 units)

Total for Minor in ACT = 6 subjects

Course 4 Humanities, Arts, and Social Science (HASS) Concentrations

MIT provides a substantial and varied program in the humanities, arts, and social sciences that forms an essential part of the education of every undergraduate. This program is intended to ensure that students develop a broad understanding of human society, its traditions, and its institutions. The HASS requirement enables students to deepen their knowledge in a variety of cultural and disciplinary areas and encourages the development of sensibilities and skills vital to an effective and satisfying life as an individual, a professional, and a member of society.

The HASS Concentration is an integral part of the General Institute Requirements. The Department of Architecture offers two interrelated HASS concentrations

History of Architecture, Art and Design (HASS)
Minor Advisor: Lauren Jacobi, 3-305, (617) 253-7572, jacobi@mit.edu

Art, Culture and Technology (HASS)
Minor Advisor, Gediminas Urbonas, E15-238, (617) 324-6471, urbonas@mit.edu

The HASS Concentration is comprised of three or four approved subjects in a single field. The Concentration field advisor helps interested students develop a program of related subjects and approves the proposal prior to submission to the Office of the HASS Requirement. It is expected that the proposal will be submitted prior to the start of the junior year.

In consultation with the Concentration Advisor, students develop a program of four related subjects to promote increased knowledge in that particular field.

History of Architecture, Art, and Design Concentration

Four subjects are required from two groups of study, three from Group 1 and one from Group 2

Group 1

History of Architecture and Design

- 4.603 Understanding Modern Architecture (FA, HASS-A, 12 units)
- 4.605 A Global History of Architecture (SP, HASS-A, 12 units)
- 4.609 Seminar in the History of Art and Architecture (SP, HASS-A, 12 units)
- 4.614 Building Islam (FA, HASS-A, 12 units)
- 4.622 Islamic Gardens and Geographies (SP, HASS-A, 12 units)
- 4.657, Design: The History of Making Things (SP, HASS-A, CI-H, 12 units)

History of Art

- 4.601 Introduction to Art History (FA, HASS-A, 12 units)
- 4.602 Modern Art and Mass Culture (SP, HASS-A, 12 units)
- 4.635 Early Modern Architecture and Art (FA, HASS-A, 12 units)
- 4.636 Topics in European Medieval Architecture and Art (FA, HASS-A, 12 units)
- 4.641 19th-Century Art: Painting in the Age of Steam (FA, HASS-A, 12 units)
- 4.651 Art Since 1940 (SP, HASS-A, 12 units)

Group 2

Art, Culture & Technology

- One subject from Group 1 on the ACT Concentration list

Total for Concentration in History of Architecture, Art, and Design = 4 subjects

Art, Culture, and Technology Concentration

Four subjects are required from two groups of study, three from Group 1 and one from Group 2.

Group 1

Art, Culture & Technology

Introductory Subjects

- 4.301 Introduction to the Artistic Experimentation (FA/SP, HASS-A, 12 units)
- 4.302 Foundations in Art, Design and Spatial Practices SP, 12 units)
- 4.320 Introduction to Sound Creations (FA, HASS-A, 12 units)
- 4.322 Introduction to 3D Art Work (FA, HASS-A, 12 units)
- 4.341 Introduction to Photography & Related Media (FA/SP, HASS-A, 12 units)
- 4.354 Introduction to Video and Related Media (FA/SP, HASS-A, 12 units)

Intermediate / Advanced Subjects

- 4.307 Art, Architecture, and Urbanism in Dialogue (FA, HASS-A, 12 units)
- 4.314 Advanced Workshop in Artistic Practice and Trans-disciplinary Research (FA, HASS-A, 12 units)
- 4.344 Advanced Photography and Related Media (FA/SP, HASS-A, 12 units)
- 4.352 Advanced Video and Related Media (FA/SP, HASS-A, 12 units)
- 4.356 Cinematic Migrations (SP, HASS-A, 12 units)
- 4.361 Performance Art Workshop (SP, HASS-A, 12 units)
- 4.368 Studio Seminar in Public Art / Public Space (SP, HASS-A, 12 units)
- 4.373 Advanced Projects in Visual Arts (SP, HASS-A, 12 units)

Group 2

History of Architecture, Art, and Design Concentration

- One subject from Group 1 on the History of Art Concentration list.

Total for Concentration in ACT = 4 Subjects

Externships & Research Opportunities

MIT Student Externship Program

The Student/Alumni Externship Program connects current students with alumni in workplaces nationally and internationally during MIT's Independent Activities Period (IAP). These are short-term opportunities in a variety of fields that offer long-term benefits. Externships can lead to summer internships, full-time employment, and meaningful connections with alumni.

Externships can last from one week through the entire length of IAP. The sponsors offer externships at companies, start-ups, labs, and universities primarily in the Boston, New York, Washington, DC, Chicago, Houston, Los Angeles, and San Francisco areas. Externships are also offered in other U.S. and international cities.

https://alum.mit.edu/communities/mit-students/student-externships

Undergraduate Research Opportunity Program (UROP)

The Department of Architecture has many Undergraduate Research Opportunity Program (UROP) projects, ranging from research in building technology (indoor air quality, building energy analysis, thermal comfort, ventilation systems) to computer graphics (visualization, image synthesis, computer-aided design) to architecture and art (public art projects, creating electronic media, museum installations).

UROP cultivates and supports research partnerships between MIT undergraduates and faculty - whether you join established research projects or pursue your own ideas. Projects occur during the academic year and/or in the summer session — lasting for an entire semester or continuing for a year or more.

By engaging in UROP, you'll have the opportunity to participate in each phase of research activity—from developing research plans, writing proposals, and conducting research — to analyzing data and presenting or publishing your results.

For more information, contact the UROP Office at MIT. Tips on how to secure opportunities can be found on this site. Many students find success by inquiring directly with faculty in the Department that they are interested in working with.

The UROP Coordinator is Larry Sass, 7-304, lsass@mit.edu

International Opportunities

MIT International Science & Technology Initiatives

MISTI internships give students critical hands-on experience with the challenges of today's urban infrastructure, from design and sustainability to the complex issues raised by mega cities.

MISTI students pursue their interests in architecture, conservation, urban planning, transportation, and antiquities, through programs at universities, government institutes, and world-renowned firms around the world.

Rooted in the Mens et Manus tradition, MISTI matches MIT students with tailored internship, research opportunities abroad.

MISTI's hands-on international learning experiences expand MIT's international reach while helping MIT students develop crucial global leadership skills. MISTI fosters strong inter-cultural connections and advances global innovation through student internships, faculty collaborations, and partnerships with industry leaders and governments around the world

MIT