2018-2019

MIT
Architecture, Art, and Design Undergraduate Programs
MIT Architecture / Course 4
Undergraduate Programs

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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, 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 Exploratory Subjects

Freshman Pre-Orientation Program (FPOP)
FPOP is offered in August as a way for incoming freshman 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 Undergraduate Advising and Academic Programming website.

4.02A Design Studio: How to Design Intensive
9 UNITS, IAP, HASS-ART
This class is for students who are intending to major in architecture and design, or students who are curious about architectural education. It is the first in a series of required design studios, and combines hands-on practice with design theory. The class meets daily for three weeks during IAP and students receive HASS/Art credit. It is the equivalent of 4.021 offered during the fall term.

4.021 Design Studio: How to Design
12 UNITS, FALL AND SPRING, HASS-ART
This class is for students who are intending to major in architecture and design, or students who are curious about architectural education. It is the first in a series of required design studios, and combines hands-on practice with design theory.

4.110J Design Across Scales and Disciplines
12 UNITS, SPRING, HASS-ART
This joint subject with Media Arts and Sciences explores the reciprocal relationships 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/Art requirement.
4.605 A Global History of Architecture
12 UNITS, SPRING, HASS-ART
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, the HASS/Art requirement, and provides a solid background for other classes in architecture history.

4.657 Design: The History of Making Things
12 UNITS, SPRING, HASS-A, CI-H
The term design has many meanings, but at its core it refers to the human capacity to shape the environment we inhabit. Design is as old as humanity itself and studying its history provides a way to think critically about the past through the lens of design. To think critically about design is to understand not only its history of successes, but also its missteps and its unintended consequences. This course examines all three aspects, following themes in the history of design with an emphasis on design for organized manufacture from the eighteenth century to the present. Though its focus is on Euro-American theory and practice, we seek to situate both in their global contexts, contexts that range from early modern transcontinental trade to imperialism to contemporary globalization. Questions the course will pose include: How have the processes and products of design been shaped by new technological possibilities, whether the discovery of silk, the invention of the automatic loom, or the development of the computer? 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 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?
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 25 are undergraduate majors and 60 are undergraduate minors. The Department offers over 100 courses annually (graduate and undergraduate) taught by a faculty of 55.
Course 4 / Bachelor of Science in Architecture (BSA) Curriculum

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 (HASS-A, 12 units) or
- 4.02A Design Studio: How to Design Intensive (HASS-A, 9 units, taken during IAP)
- 4.022 Design Studio: Introduction to Design Techniques and Technologies (12 units)
- 4.302 Foundations in the Art, Design, & Spatial Practices (CI-M, 12 units)
- 4.401 Environmental Technologies in Buildings (12 units)
- 4.440J Introduction to Structural Design (REST, 12 units)
- 4.500 Design Computing: Art, Objects and Space (12 units)
- 4.603 Understanding Modern Architecture, (HASS-A, 12 units)

In the junior and senior years, students take the following more advanced subjects —

- 4.023 Architecture Design Studio 1 (CI-M, 24 units)
- 4.024 Architecture Design Studio 2 (24 units)
- 4.025 Architecture Design Studio 3 (24 units) or
- Two subjects from the list of Restricted Electives (next page)
- 4.501 Advanced Design Projects in Digital Fabrication (12 units) or
- 4.502 Advanced Visualization: Architecture in Motion Graphics (12 units)
- 4.605 The Global History of Architecture, (HASS-A, 12 units) or
- 4.614 Building Islam, (HASS-A, 12 units) or
- 4.635 Early Modern Architecture and Art, (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
- 4.322 Introduction to Three-Dimensional Art Work
- 4.341 Introduction to Photography and Related Media
- 4.354 Introduction to Video and Related Media
- 4.368 Studio Seminar in Public Art/Public Space

Building Technology (BT)
- 4.411 D-LAB Schools: Building Technology Laboratory
- 4.432 Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods

Computation
- 4.504 Design Scripting
- 4.520 Visual Computing 1
- 4.522 Visual Computing 2

History, Theory, and Criticism of Architecture and Art (HTC)
- 4.601 Introduction to Art History
- 4.602 Modern Art and Mass Culture
- 4.651 Art Since 1940
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. At the beginning of each semester, every faculty member planning to teach a studio makes a short presentation of his/her program to the department at the Preview of Design Studios. The preview is generally held on Registration Day. 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
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, and first- and second-year students.
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, PREREQ: 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, PREREQ: 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 online 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.
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 pursue 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, 12 units, HASS-A)
  OR 4.02A, Design Studio: How to Design Intensive (IAP, 9 units, HASS-A)
- 4.022, Design Studio: Introduction to Design Techniques and Technologies (FA + SP, 12 units, pre-req: 4.021)
- 4.031, *Design Studio: Objects and Interaction (FA, 12 units, pre-req: 4.022) or
- 4.032, *Design Studio: Information and Visualization (SP, 12 unit, pre-req: 4.022)

**Foundation Subjects (48 units)**

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

**Thesis Subjects (24 units)**

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

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

**Objects**

- 4.031, *Design Studio: Objects and Interaction (FA, 12 units, pre-req: 4.022)
- 4.041, Design Studio: Advanced Product Design (SP, 12 units, pre-req: 4.031)
- 4.043, Design Studios: Advanced Interaction (SP, 12 units, pre-req: 4.031)
- 4.118, Creative Computing (SP, 12 units, pre-req: 4.500)
- 4.125, Furniture Making Workshop (SP, 9 units)
- 4.451, Computational Structural Design & Optimization (FA, 12 units, pre-req: 4.440 or 2.001 or 1.050 and 6.00 or 1.000)
- 4.501, Advanced Design Projects in Digital Fabrication (SP, 12 units, pre-req: 4.500)
- 2.00A, Fundamentals of Engineering Design: Explore Space, Sea and 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 (and Talk, and Think) about Objects (9 units, HASS-H)

**Information**

- 4.032, *Design Studio: Information and Visualization (SP, 12 units, pre-req: 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)
- 4.504, Design Scripting (SP, 12 units, prereq: 4.500)
- 4.520, Visual Computing 1 (FA, 12 units)
- CMS.405, Visual Design (12 units, HASS-H)
- CMS.622, Applying Media Technologies in the Arts and Humanities (12 units, HASS-A)
- CMS.633, Digital Humanities I: Topics, Techniques, and Technologies (12 units, HASS-H)
- MAS.110, Fundamentals of Computational Media Design (12 units, HASS-A, CI-H)

**Art & Experience**

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

*Either 4.031 or 4.032 may be used as a restricted elective if not selected as part of the design studio requirement.
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, and first- and second-year students.

Choice of either 4.031 or 4.032:

4.031 Design Studio: Objects and Interaction
12 UNITS, FALL, PREREQ: 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  
12 UNITS, FALL AND SPRING, PREREQ: 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 (Meets with MAS.650)  
12 UNITS, SPRING, HASS-A  
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  
12 UNITS, SPRING, CI-M; CREDIT CANNOT ALSO BE RECEIVED FOR 4.301  
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
12 UNITS, FALL
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
12 UNITS, SPRING, HASS-A, CI-H
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 assess the dynamic interaction of design with politics, economics, technology, and culture in the past and at present. Limited to 36.
Student Work
The first project in 4.022 introduces students to systems of organization. Students study select precedents to develop an understanding of iterative processes and rule-based design strategies wherein certain parameters work together to produce a coherent and logical whole.

Above, Laura Li’s generative drawing for 4.022, Spring 2017. Li studied the patterns associated with flocking. Right, Elyssa Kohr examined the logic of frost. These sketches were part of the first drawing exercise for 4.022, Spring 2017.
Students Zachary Balgobin, Sara Falcone, Orli Hakanoglu, and Kate Weishaar demonstrate their final group project, Levitating Assemblage, for 4.022 in Spring 2015.
For the second project in 4.022, students designed installations across campus. Hypar Tunnel, by Siobhan Finlay, Rami Rustom, and Michelle Xie, is centered on the themes of weight, balance, and counterbalance, and, by virtue of the structural characteristics of the hypar geometry, is entirely self-balancing. The modules protrude and retract in a dance with the passerby.
For the second project in 4.022 students designed installations across campus. Hot and Fold, by Laura Li, Fano Razafindrakoto, and Rinako Sonobe, is a kinetic installation inspired by techniques of repetitive origami folds applied to paper. The full-scale composition imitates the behavior of folded paper by using scored foamcore, experimenting with the effects of volume and depth on an initially 2D (paper) system. Pulling the rope downward activates the mechanism and expands the sculpture vertically from its condensed “folded” state, forming a tall, enclosed structure. Photos: Sarah Wagner.
In front: ‘Strength in Numbers’ by William Wu, Lisbeth Acevedo, and Hannah Lienhard, is a 24-foot spanning structure. Its two symmetrical arms, each broken into four groups of three tetrahedral units, are able to curl in response to tensioned control ropes. In addition, the structure is reversibly manufactured: it can be broken apart into component pieces as easily as it is assembled and deployed.
'Vertebrae' by Justina Yang, Maggie Hughes, and Marcas Smith, consists of two flexible, segmented obelisks made from blocks of foam. Each tower can be manipulated to stand vertically or bend in three directions by either tensioning or relaxing cords which run through the towers.
4.031 introduces students to design as the giving of form, order, and interactivity to the objects that define daily life. In the first project, students study designer Enzo Mari’s ‘Autoprogettazione’. Students are asked to first produce a copy, and second, a variation. Annie Zhang’s variation, the Origami Chair, is produced from a single sheet of cardboard material; it can unfolded into a flat rectangle to allow for efficient storage and transport.
In the second project in 4.031, Second Skin, students designed textiles with properties that vary through space to envision new ways to use 3D-printing technologies. The resulting projects take inspiration not only from traditional structures such as chainmaille, weaving or knitting, but also biological structures like skin, hair, fur, and scales. Each design was 3D-Printed all as one piece, not assembled. Student work by Annie Zhang, Jimmie Harris, and Lucia Liu; Fall 2016. Photographs thanks to Jessica Rosenkrantz.
In the second project in 4.031, Fall 2017 with Jessica Rosenkrantz and Marcelo Coelho, students designed and fabricated a lamp from flat materials to explore geometry, fabrication, and computation design. While the lampshade was to be constructed from wood and plastic, the real substance of the design is light itself. Students explored how the lamp can give form to light. Clockwise: Erika Anderson, Elysa Kohrs, Hiram Moncivais, and Heather Nelson.
4.032, Information and Visualization, provides an introduction to working with information, data, and visualization. Students progress through basic data analysis, visual design and presentation, and interaction techniques in four exercises: *Mapping Time*: Dang Pham; *Mapping Quantities, Categories, and Summarized Data* (weather): Yuhan Luo, George Varnavides; *Mapping Textual and Qualitative Data* (working with census information); and *Visualizing Geospatial Data*, right: Penny Webb, *Mapping Migration*; Xinhui Li; *Land Reclamation Projects in China*; Raphael Schaad, *Mountain Peak Names in the Alps*. 
Estelle Yoon’s project for 4.023, the first architecture design studio in the three-studio sequence, analyzed the triple-faced scarf splice, which is characterized by two interlocking pieces. Yoon selected one spatial relationship of the joint to develop in her second project, a mediatheque in downtown Boston. Yoon proposed a vertical circulation system to connect four distinct spaces while carefully orchestrating the spatial sequence and views for the occupant.
Calvin Zhong’s project for a theater challenges the relationship between the performer and the audience through formal acts. “The street is brought inside the building, and the theater to the street,” Zhong writes. This project was part of the Fall 2016 4.023, the first architecture design studio in the sequence.
The 4.025 is the final architecture design studio in the sequence. In Platforms of Exchange in the Medina, with lecturer Cristina Parreno Alonso, students designed a Craft Factory in the Medina of Fez, Morocco.

In her project ‘Wall as Landscape’, Yue Shao proposed a series of new walls which adjust to the existing context while bridging the river. The wall acts as an open boundary; together, the walls construct a new landscape, allowing new views of the city. Each ‘wall’ is also occupiable, creating a varied experience that echoes the narrow passageways of the existing urban fabric of the medina. Above, plan of the project and city. Right, sectional perspective into one of the interiors, project’s relationship to existing streets, and view from the roof onto the city.
Anna Kaertner, BSA '15, presents her thesis “The Olympics as a Social Opportunity: Integrated Social Housing in Rio de Janeiro.” Anna’s thesis considers the afterlife of the Olympic Village. The architectural and urban interventions activate the ground plane between planned residential towers to enforce interaction between socio-economic groups. Following graduation, Kaertner worked with Höweler + Yoon Architecture. She is pursuing a Master of Architecture degree at the Harvard Graduate School of Design. Photo: Justin Knight.
Kaertner’s senior thesis, “The Olympics as Social Opportunity: Integrated Social Housing in Rio de Janeiro” addressed inequality in Olympic planning. The drawings highlight two scenarios in which a new ground plan and circulation surround existing towers. This new surface creates space for public amenities and pathways for interaction between occupants: athletes, residents, and visitors. Programmatic interventions re-purpose Olympic facilities to introduce new public programs: a marketplace, sites for recreation, and civic programs such as a school, library, and an amphitheater.
Aurimas Bukauskas, BSA ’15 presents his thesis “Whole-Timber Structural Systems: Naturally-Engineered High-Performance Structures.” Aurimas won the Carroll L. Wilson Award to further his research; he travelled to Scandinavia to examine forest management and the potential of whole timber structures. Photo: Justin Knight.
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 the BSAD. It is optional for the BSA degree 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.

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.
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 — AZRA AKSAMIJA • E15-231 • 324-4488 • AZRA@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 all three subjects from Group 1 and three subjects from Group 2.

Group 1 — Take 3 subjects

-  4.021 Design Studio: How to Design or
-  4.02A Design Studio: How to Design Intensive
-  4.022 Design Studio: Introduction to Design Techniques and Technologies
-  4.031 Design Studio: Objects and Interaction or
  4.032 Design Studio: Information and Visualization

Group 2 — Take 3 subjects

Objects

-  2.00A Fundamentals of Engineering Design: Explore Space, Sea and Earth
-  2.00 Introduction to Design (1/2 term)
-  2.007 Design and Manufacturing
-  2.009 The Product Engineering Process
-  4.031 Design Studio: Objects and Interaction (if not used above)
-  4.041 Design Studio: Advanced Product Design
-  4.043 Design Studio: Advanced Interactions
-  4.110 Design Across Scales and Disciplines
-  4.118 Creative Computing
-  4.125 Furniture Making Workshop
-  4.451 Computational Structural Design & Optimization
-  4.501 Advanced Design Projects in Digital Fabrication
-  4.657 Design: The History of Making Thing
-  EC.720J D-Lab: Design
-  MAS.377 Objectification: How to Write (and Talk, and think) About Objects

Information

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

Art and Experience

- 4.301 Introduction to Artistic Experimentation
- 4.302 Foundations in Art, Design, and Spatial Practices
- 4.307 Art, Architecture and Urbanism in Dialogue
- 4.320 Introduction to Sound Creations
- 4.322 Introduction to 3-D Art Work
- 4.341 Introduction to Photography & Related Media
- 4.354 Intro to Video & Related Media
- 4.602 Modern Art & Mass Culture
- 21M.603 Intro to Design for the Theatre
- CMS. 362 Civic Media Collaborative Design Studio
- CMS.634J Designing Interactions

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 (Fall and Spring) or 4.02A (IAP)
- 4.022 Design Studio: Introduction to Design Techniques and Technologies (Fall and Spring)

Option 1 — Take 3 subjects

- 4.023 Architecture Design Studio 1 (Fall)
- 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
- 4.218 Disaster Resilient Design
- 4.231 SIGUS Workshop
- 4.250J Introduction to Urban Design and Development

Art, Culture and Technology

- 4.301 Introduction to Artistic Experimentation
- 4.302 Foundations in Art, Design, and Spatial Practices
- 4.307 Art, Architecture and Urbanism in Dialogue

Building Technology

- 4.401 Environmental Technologies in Buildings
- 4.411J D-Lab Schools: Building Technology Laboratory
- 4.440J Introduction to Structural Design
- 4.451 Computational Structural Design and Optimization

Computation

- 4.500 Design Computation: Art, Objects and Space
- 4.501 Advanced Design Projects in Digital Fabrication
- 4.502 Advanced Visualization: Architecture in Motion Graphics
- 4.504 Design Scripting
History and Theory of Architecture and Art

- 4.603 Understanding Modern Architecture
- 4.605 A Global History of Architecture
- 4.609 Seminar in the History of Art and Architecture
- 4.614 Building Islam
- 4.635 Early Modern Architecture and Art
- 4.636 Topics in Western Medieval Architecture and Art

Total for Minor in Architecture = 5 or 6 subjects
Minor in the History of Architecture, Art and 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
- 4.614 Building Islam

History of Art — Choose one subject
- 4.601 Introduction to Art History
- 4.602 Modern Art and Mass Culture

Group 3 — Take 3 subjects

History of Architecture and Design
- 4.603 Understanding Modern Architecture
- 4.657 Design: The History of Making Things

History of Art
- 4.606 Visual Perception and Art
- 4.635 Early Modern Architecture and Art
- 4.641 19th-Century Art
- 4.651 Art Since 1940
- 4.671 Nationalism, Internationalism, and Globalism in Modern Art

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)

Total for Minor in History of Architecture & Art = 6 subjects
Minor in Art, Culture And 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 or
- 4.302 Foundations in Art, Design, and Spatial Practices

and one from the following list:

- 4.601 Introduction to Art History
- 4.602 Modern Art and Mass Culture
- 4.606 Visual Perception and Art
- 4.635 Early Modern Architecture and Art
- 4.641 19th-Century Art
- 4.651 Art Since 1940
- 4.671 Nationalism, Internationalism, and Globalism in Modern Art

Group 2 — Take 2 subjects

- 4.320 Introduction to Sound Creations
- 4.322 Introduction to Three-Dimensional Art Work
- 4.341 Introduction to Photography and Media
- 4.354 Introduction to Video and Related Media

Group 3 — Take 2 subjects

- 4.312 Advanced Studio on the Production of Space
- 4.314 Advanced Workshop in Artistic Practice and Transdisciplinary Research
- 4.344 Advanced Photography and Related Media
- 4.352 Advanced Video and Related Media
- 4.356 Cinematic Migrations
- 4.361 Performance Art Workshop
- 4.368 Studio Seminar in Public Art/Public Space
- 4.373 Advanced Projects in Visual Arts

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 • 253-7572 • JACOBI@MIT.EDU

Art, Culture and Technology (HASS)
MINOR ADVISOR — AZRA AKSAMJIA • E15-223 • 324-4488 • AZRA@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
‣ 4.605 A Global History of Architecture
‣ 4.614 Building Islam
‣ 4.657 Design: The History of Making Things

History of Art

‣ 4.601 Introduction to Art History
‣ 4.602 Modern Art and Mass Culture
‣ 4.606 Visual Perception and Art
‣ 4.635 Early Modern Architecture and Art
‣ 4.641 19th-Century Art
‣ 4.651 Art Since 1940
‣ 4.671 Nationalism, Internationalism & Globalism in Modern Art

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
- 4.302 Foundations in Art, Design and Spatial Practices
- 4.320 Introduction to Sound Creations
- 4.322 Introduction to 3D Art Work
- 4.341 Introduction to Photography and Related Media
- 4.354 Introduction to Video and Related Media

Intermediate / Advanced Subjects

- 4.307 Art, Architecture, and Urbanism in Dialogue
- 4.312 Advanced Studio on the Production of Space
- 4.314 Advanced Workshop in Artistic Practice and Transdisciplinary Research
- 4.344 Advanced Photography and Related Media
- 4.352 Advanced Video and Related Media
- 4.356 Cinematic Migrations
- 4.361 Performance Art Workshop
- 4.368 Studio Seminar in Public Art / Public Space
- 4.373 Advanced Projects in Visual Arts

Group 2 — History of Architecture, Art, and Design Concentration

- One subject from Group 1 on the History of Architecture, Art, and Design Concentration list.

Total for Concentration in ACT = 4 Subjects
Internships

The Department organizes an internship program through which students work in architecture offices. This experience provides students with valuable hands-on training and an opportunity to improve skills while experiencing the inner workings of a professional architectural practice.

Internships require full-time work. Architecture Majors are eligible and encouraged to participate. Students register for 4.190, Practical Experience in Architecture for work done in January or during the summer.

The Internship Coordinator is Paul Pettigrew, 7-337 • PAULPETT@MIT.EDU.

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).

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.