DEPARTMENT OF ARCHITECTURE

The Department of Architecture (http://architecture.mit.edu) offers degrees at the bachelor, master, and doctoral levels. The department is composed of five discipline groups. They are Architecture and Urbanism; Building Technology; Computation; History, Theory and Criticism of Architecture and Art (HTC); and the Program in Art, Culture and Technology (ACT). The Aga Khan Program in Islamic Architecture (AKPIA) is a research group offering its own Master of Science in Architecture Studies and a PhD in association with HTC. The Center for Advanced Urbanism supports both the architecture stream and the Master of Science in Architecture Studies program in urbanism, while acting as an umbrella for research initiatives and collaborative projects between the Departments of Architecture and Urban Studies and Planning. The varied disciplines support substantial research activity.

The department offers seven degree programs: the Bachelor of Science in Architecture (BSA), Bachelor of Science in Architecture Studies (BSAS), Master of Architecture (MArch), Master of Science in Architecture Studies (SMArchS), Master of Science in Building Technology (SMBT), Master of Science in Art, Culture and Technology (SMACT), and the Doctor of Philosophy (PhD). The SMArchS and PhD programs offer concentrations in multiple research streams.

Architecture and Urbanism is taught from a broad range of perspectives. Diverse architectural design studios are offered at both the undergraduate and graduate levels. The undergraduate studio sequence begins with instruction in design fundamentals and continues with design projects of increasing complexity. Entering graduate students enroll in a three-term core program that is tightly integrated with complementary subjects in design skills, geometric disciplines, cultural and theoretical precedents, and materials and construction. Advanced "option" studios give graduate students the opportunity to broaden their experience of culture, contexts, and varying scales for design, and develop their own attitudes and positions toward architectural production. In thesis, a student develops a hypothesis and design strategy for a comprehensive architectural project or a design research inquiry that is carried out as an independent, critical project—from concept to completion—under the guidance of an advising committee.

Computer resources for educational purposes are distributed in the laboratories and studios of the department and overseen by the staff of the School of Architecture and Planning's computer resources office. Students are required to learn the techniques and applications of computational-based design, production, and advanced representation. Other computation subjects and studio work permit further experimentation with modeling techniques, graphic representations, design methods, technical analysis, prototyping, and assistance with the design process.

The teaching of the Architecture and Urbanism faculty occurs primarily in the studio. However, workshops, lectures, seminars, and research projects all contribute to architectural education. A broad range of topics are introduced and integrated in the curriculum, including sustainability, computation, materials, fabrication, infrastructure, politics, social engagement, and cultural theory. The architecture design studio is the laboratory where these topics intermingle and students synthesize design concepts.

The Master of Architecture (MArch) is a three and one-half-year degree. In exceptional circumstances, a student may be admitted with "advanced entry" and complete the program in two and one-half years, subject to prior academic qualifications in architecture. These professional degrees are structured to educate those who aspire to registration and licensure as architects.

The undergraduate Bachelor of Science in Architecture is a preprofessional degree program. It is useful for those wishing a foundation in the field of architecture as preparation for either continued education in a professional degree program or for employment options in fields related to architecture and design.

The Architecture and Urbanism area of study offers a Bachelor of Science in Architecture, a Minor in Architecture and a Minor in Urban Studies. This area of study offers a Master of Science in Architecture Studies degrees.

Building Technology includes teaching and applications of the fundamentals of technology as well as research in critical topics for the future of the built environment and natural resources. The program explores ways to use design and technology to create buildings that contribute to a more humane and environmentally responsible built world. This includes integrated architectural design strategies, resource accounting through material flow analysis and life cycle assessment, building and urban energy modeling and simulation, human comfort analysis, control design and engineering, and other technologically-informed design methods. Through lecture subjects, laboratories, workshops, and independent research projects, students study innovative materials and assemblies, emerging and nontraditional building materials, low-energy and passive building energy strategies; innovative analysis and modeling of historic structures; and various issues of energy and material resources at the urban scale, including urban environmental sensing, the urban heat island effect, and urban metabolism. Research facilities of other departments such as Mechanical Engineering and Civil and Environmental Engineering are also used in joint research projects.

This area of study offers a Master of Science in Building Technology (SMBT), a Master of Science in Architecture Studies (SMArchS), and a doctoral degree with emphasis on building technology.

The Computation group inquires into the varied nature and practice of computation in architectural design, and the ways in which design meaning, intentions, and knowledge are constructed through computational thinking, representing, sensing, and making. They focus on the development of innovative computational tools, processes and theories, and the application of these in
creative, socially meaningful responses to challenging design problems. Topics taught cover visualization, digital fabrication and construction processes and technologies, shape representation and synthesis, building information modeling (BIM), generative and parametric design, critical studies of digital and information technologies, digital heritage, and software and hardware development of advanced tools for spatial design and analysis. Students are encouraged to acquire both the technical skills and the theoretical and conceptual foundations to rethink and challenge the limits of current design processes and practices, and to consider the social and cultural implications of their positions.

This area of study offers a concentration in the Master of Science in Architecture Studies (SMArchS) program and a doctoral program. SMArchS and PhD students are encouraged to take subjects in other relevant departments as a means to explore and develop their interests.

The History, Theory and Criticism of Architecture and Art (HTC) group teaches subjects that deal with the history of architecture, art and design, placing strong emphasis on historiography and analytical methodologies. Offerings deal with the social and physical context of the built environment, the significant issues in current disciplinary thinking, as well as with the philosophical, political, and material contexts for works of art and architecture. Subjects are taught from the Renaissance to the present, with emphasis on topics of modern art and architecture. They focus on materials that are both abstract and concrete, with scales that range from the architectural drawing to the art installation to the urban environment. There is a special emphasis on topics of modern art and architecture in Europe as well as the Americas, with a comparable set of offerings on the Islamic world developed by AKPIA and taught within the HTC group.

HTC offers a HASS concentration and Minor in the History of Architecture, Art and Design that are open to all MIT undergraduates. There is a SMArchS concentration in HTC, and a doctoral program.

The Aga Khan Program for Islamic Architecture (AKPIA) at MIT is a graduate program dedicated to the study of architecture, urbanism, architectural history, landscape, and conservation in the Islamic world. The program prepares students for careers in research, design, and teaching. Topics covered in its curriculum include critical study of the history and historiography of Islamic architecture; the interaction between architecture, society, and culture; strategies of urban and architectural preservation; and environmental and material-sensitive landscape and design research.

Established in 1979, AKPIA offers students a concentration in Islamic architecture and urbanism as part of the two-year SMArchS degree and the PhD program in HTC. Undergraduates may concentrate in Middle Eastern Studies using subjects offered by AKPIA. The program also has links with the City Design and Development and Environmental Planning and Policy programs in the Department of Urban Studies and Planning, ArchNet, the Aga Khan Programs at Harvard, the Aga Khan Trust for Culture (AKTC), and the Aga Khan Development Network (AKDN).

The Program in Art, Culture and Technology (ACT) explores art broadly and globally in its historic and contemporary forms, relating it to culture, science, technology, and design. This is reflected not only in ACT’s academic offerings, but in its public programs and the research of faculty, fellows, and guests. The program aims to build bridges between MIT discipline areas and departments. Research and pedagogy are intertwined, and MIT’s culture of scientific inquiry informs work in all artistic arenas: cinema, video, sound, performance, photography, experimental media and new genres, conceptual and spatial experiments with architecture and design, interventions in public spaces, and writings and publications. Critical thinking, knowledge mining, and creative engagement, along with explorations of changing public and private spheres, are of particular relevance. The program also maintains and supports the Center for Advanced Visual Studies (CAVS) Archives, which preserves the legacy of the Center as set forth by artist and educator György Kepes, and serves as a resource for scholars.

ACT offers a HASS minor and concentration and a two-year graduate program leading to a Master of Science in Art, Culture and Technology (SMACT).

Inquiries
Further information concerning undergraduate and graduate academic programs in the department, admissions, financial aid, and assistantships may be obtained from the Department of Architecture (http://architecture.mit.edu), Room 7-337, 617-253-7387.

Undergraduate Study
The Department of Architecture offers two undergraduate courses of study. They provide a broad undergraduate education for students who have clear professional goals and for those who desire a solid foundation for a number of possible careers. Course 4 leads to the Bachelor of Science in Architecture, and Course 4-B leads to the Bachelor of Science in Architecture Studies.

Bachelor of Science in Architecture (Course 4)
Course 4 (http://catalog.mit.edu/degree-charts/architecture-course-4) offers a program introducing students to the five discipline areas: art, culture and technology; architectural design and urbanism; building technology; design and computation; and history, theory and criticism of architecture, art and design.

The requirements for the SB in Architecture (BSA) (http://catalog.mit.edu/degree-charts/architecture-course-4) curriculum begin with two introductory subjects, 4.021 Introduction to Architecture Design and 4.022 Architecture Design Foundations, intended as an introduction for sophomores. The remaining core
subjects include study in the arts, design and computation, building
technology, and the history of architecture.

The BSA includes sequential studios. The approach fosters
investigation and discussion in the development of sensitivity
to the built environment. These sensibilities are linked to values
and responsibilities to the community at large. Students in design
studios develop technical and analytical skills and learn synthesis
and invention using the elements of architectural form: material,
structure, construction, light, sound, memory, and place. A thesis is
optional and taken during the senior year.

Students who plan to continue their studies in a professional
graduate program in architecture must apply for admission to a
school offering the Master of Architecture (MArch).

**Bachelor of Science in Architecture Studies (Course 4-B)**
Course 4-B ([http://catalog.mit.edu/degree-charts/architecture-
course-4-b](http://catalog.mit.edu/degree-charts/architecture-
course-4-b)) is offered for students who find that their basic
intellectual commitments are to subjects within the Department
of Architecture but whose educational objectives cut across
departmental boundaries. These students may, with the approval of
the department, plan a course of study that meets their individual
needs and interests while including the fundamental areas within
the department. For example, students might create a coherent
program combining subjects in Course 4 with subjects in urban
studies and planning, comparative media studies, systems analysis,
computer science, etc.

As early as possible, students should discuss their interests and
intended programs with their advisor and departmental faculty
members. A student who wishes to follow Course 4-B must initially
register as a Course 4 major and take core subjects in each of the
discipline areas within the department. By the beginning of the
junior year, the student is expected to submit to the department a
proposal that includes a statement of educational goals, a list of
subjects to be taken to fulfill these goals (84 units), and a timetable
of when the subjects will be taken. When the proposal is approved
by the Department of Architecture Undergraduate Curriculum
Committee, the student may officially switch to the 4-B major.

During the junior and senior years, the approved interdisciplinary
course of study is pursued. A senior thesis, preceded by 4.THT[J]
Thesis Research Design Seminar, is required.

**Minor in Architecture**
The requirements for a Minor in Architecture are as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.021</td>
<td>Introduction to Architecture Design</td>
<td>12</td>
</tr>
<tr>
<td>4.022</td>
<td>Architecture Design Foundations</td>
<td>12</td>
</tr>
<tr>
<td>4.605</td>
<td>A Global History of Architecture</td>
<td>12</td>
</tr>
<tr>
<td>Select one of the following options:</td>
<td>27-48</td>
<td></td>
</tr>
<tr>
<td>4.023</td>
<td>Architecture Design Studio I</td>
<td></td>
</tr>
</tbody>
</table>

**Option 1:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>4.024</td>
<td>Architecture Design Studio II</td>
</tr>
<tr>
<td>Option 2:</td>
<td></td>
</tr>
<tr>
<td>Select three subjects from the following:</td>
<td></td>
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<tr>
<td>Up to two from the following:</td>
<td></td>
</tr>
<tr>
<td>4.110</td>
<td>Design Across Scales and Disciplines</td>
</tr>
<tr>
<td>4.211[J]</td>
<td>The Once and Future City</td>
</tr>
<tr>
<td>4.231</td>
<td>SIGUS Workshop</td>
</tr>
<tr>
<td>4.250[J]</td>
<td>Introduction to Urban Design and Development</td>
</tr>
</tbody>
</table>

**Option 2:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>4.301</td>
<td>Introduction to Artistic Experimentation</td>
</tr>
<tr>
<td>4.302</td>
<td>Foundations in Art, Design, and Spatial Practices</td>
</tr>
<tr>
<td>4.307</td>
<td>Art, Architecture, and Urbanism in Dialogue</td>
</tr>
<tr>
<td>4.312</td>
<td>Advanced Studio on the Production of Space</td>
</tr>
<tr>
<td>4.314</td>
<td>Advanced Workshop in Artistic Practice and Transdisciplinary Research</td>
</tr>
<tr>
<td>4.320</td>
<td>Introduction to Sound Creations</td>
</tr>
<tr>
<td>4.322</td>
<td>Introduction to Three-Dimensional Art Work</td>
</tr>
<tr>
<td>4.341</td>
<td>Introduction to Photography and Related Media</td>
</tr>
<tr>
<td>4.344</td>
<td>Advanced Photography and Related Media</td>
</tr>
<tr>
<td>4.352</td>
<td>Advanced Video and Related Media</td>
</tr>
<tr>
<td>4.354</td>
<td>Introduction to Video and Related Media</td>
</tr>
<tr>
<td>4.356</td>
<td>Cinematic Migrations</td>
</tr>
<tr>
<td>4.361</td>
<td>Performance Art Workshop</td>
</tr>
<tr>
<td>4.368</td>
<td>Studio Seminar in Art and the Public Sphere</td>
</tr>
<tr>
<td>4.373</td>
<td>Advanced Projects in Art, Culture and Technology</td>
</tr>
<tr>
<td>Up to two from the following:</td>
<td></td>
</tr>
<tr>
<td>4.401</td>
<td>Environmental Technologies in Buildings</td>
</tr>
<tr>
<td>4.411[J]</td>
<td>D-Lab Schools: Building Technology Laboratory</td>
</tr>
<tr>
<td>4.432</td>
<td>Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods</td>
</tr>
<tr>
<td>4.440[J]</td>
<td>Building Structural Systems I</td>
</tr>
</tbody>
</table>

**Up to two from the following:**
# Minor in Design Computing

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>4.500</td>
<td>Introduction to Design Computing</td>
</tr>
<tr>
<td>4.501</td>
<td>Creative Design Prototyping</td>
</tr>
<tr>
<td>4.502</td>
<td>Advanced Visualization: Architecture in Motion Graphics</td>
</tr>
<tr>
<td>4.504</td>
<td>Design Scripting</td>
</tr>
<tr>
<td>4.520</td>
<td>Visual Computing I</td>
</tr>
<tr>
<td>4.522</td>
<td>Visual Computing II</td>
</tr>
<tr>
<td>4.550</td>
<td>Computational Design Lab</td>
</tr>
</tbody>
</table>

No more than one from the following:

- 4.601 Introduction to Art History
- 4.602 Modern Art and Mass Culture
- 4.603 Understanding Modern Architecture
- 4.606 Visual Perception and Art
- 4.609 Seminar in the History of Art and Architecture
- 4.610 Civic Islamic Architecture
- 4.614 Building Islam
- 4.635 Early Modern Architecture and Art
- 4.641 19th-Century Art
- 4.651 Art Since 1940
- 4.657 Design: The History of Making Things
- 4.671 Nationalism, Internationalism, and Globalism in Modern Art

## Total Units

63-84

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# Minor in Art, Culture and Technology

The HASS Minor in Art, Culture and Technology is designed to explore the conjunction of art with culture, science, technology, and design, and to develop critical and production practices.

The minor consists of six subjects arranged into three levels of study and chosen as follows:

## Tier I

Select one of the following:

- 4.301 Introduction to Artistic Experimentation 12
- or 4.302 Foundations in Art, Design, and Spatial Practices

## Tier II

Select two of the following:

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

## Tier III

Select two of the following:

- 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 Art and the Public Sphere
- 4.373 Advanced Projects in Art, Culture and Technology

## Total Units

66-72

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# Minor in Design

The Minor in Design provides undergraduates with a cohesive program of study that exposes them to the cross-disciplinary field of design. The minor provides a rigorous conceptual foundation in design along with strong design skills. Students will be introduced to design from concept to completion through contextual critical thinking, experimentation, representation, and physical production techniques, critique, iteration and reflection. The minor prepares students to pursue diverse career paths or further education in multiple areas of design, from product design to 3-D design to visual communication, and enables them to take advantage of emerging opportunities in industry and academia.

The minor consists of six subjects:

## Required Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.031</td>
<td>Design Studio: Objects and Interaction 12</td>
</tr>
<tr>
<td>4.032</td>
<td>Design Studio: Information and Visualization 12</td>
</tr>
<tr>
<td>4.101</td>
<td>Design Studio: Introduction to Design Techniques and Technologies 12</td>
</tr>
</tbody>
</table>

## Electives

Select three of the following (from either category) 33-36
Design Technology and Computation

| 2.007 | Design and Manufacturing I ¹ |
| 4.110 | Design Across Scales and Disciplines |
| 4.411[J] | D-Lab Schools: Building Technology Laboratory |
| 4.500 | Introduction to Design Computing |
| 4.502 | Advanced Visualization: Architecture in Motion Graphics |
| 4.520 | Visual Computing I |
| CMS.634 | Designing Interactions |
| EC.720[J] | D-Lab: Design ¹ |
| MAS.110 | Fundamentals of Computational Media Design |

Arts and Culture

| 4.301 | Introduction to Artistic Experimentation |
| 4.307 | Art, Architecture, and Urbanism in Dialogue |
| 4.322 | Introduction to Three-Dimensional Art Work |
| 4.341 | Introduction to Photography and Related Media |
| or 4.344 | Advanced Photography and Related Media |
| 4.602 | Modern Art and Mass Culture |
| 4.657 | Design: The History of Making Things |
| CMS.362 | Civic Media Collaborative Design Studio |

Total Units 69-72

¹ Subject has prerequisites that are outside of the program.

Minor in the History of Architecture, Art and Design

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. Introductions to the historical frameworks and stylistic conventions of art and architectural history are followed by more concentrated study of particular periods and theoretical problems in visual culture and in cultural history in general.

The minor consists of six subjects arranged into three levels of study and chosen as follows:

Tier I

| 4.601 | Introduction to Art History ¹2 |
| or 4.602 | Modern Art and Mass Culture |
| 4.605 | A Global History of Architecture ¹2 |
| or 4.614 | Building Islam |

Total Units 12

Tier II

Select three of the following with no more than two subjects from either the history of art or the history of architecture:

| 4.603 | Understanding Modern Architecture |
| 4.606 | Visual Perception and Art |
| 4.610 | Civic Islamic Architecture |
| 4.635 | Early Modern Architecture and Art |
| 4.641 | 19th-Century Art |
| 4.651 | Art Since 1940 |
| 4.657 | Design: The History of Making Things |
| 4.671 | Nationalism, Internationalism, and Globalism in Modern Art |

Tier III

Select one of the following:

| 4.609 | Seminar in the History of Art and Architecture |

Other advanced seminar in the history of art and/or architecture, including offerings from Harvard or Wellesley, with permission of the HASS field advisor and the instructor.

Total Units 72

For a general description of minors, see Undergraduate Education (http://catalog.mit.edu/mit/undergraduate-education/academic-programs/minors).

Graduate Study

The Department of Architecture offers five graduate degree programs—the Master of Architecture (MArch), Master of Science in Architecture Studies (SMArchS), Master of Science in Building Technology (SMBT), Master of Science in Art, Culture and Technology (SMACT), and the Doctor of Philosophy (PhD).

The Master of Architecture is awarded to students who complete a program, accredited by the National Architectural Accrediting Board, which is an essential step toward licensure for architectural practice.

The Master of Science in Architecture Studies program stresses research and inquiry in the built environment; the degree is meant both for students who already have their first professional architecture degree and those whose previous education orients them toward nonprofessional graduate study in architecture.

The Master of Science in Building Technology program is run jointly by the Departments of Architecture, Civil and Environmental Engineering, and Mechanical Engineering. This degree program is intended for students interested in pursuing topics of significant technical and engineering depth.

The Master of Science in Art, Culture and Technology focuses on the development of artist-thinkers in the context of an advanced
technological and scientific community. Discussion of contemporary and historical theory and criticism complements rigorous and innovative transdisciplinary studio production.

The PhD program is an advanced degree program in the areas of History, Theory and Criticism; Building Technology; and Design and Computation.

Master of Architecture
The Master of Architecture is awarded upon the satisfactory completion of an approved program of at least 312 units and an acceptable thesis. The program requires three and one-half academic years of residence.

Advanced entry may be considered in exceptional circumstances for students who have majored in architectural design at a "4 plus 2" architecture school. These students may be considered for completion of the program in two and one-half years depending on their academic experience and accomplishments.

The professional MArch program is diverse and open-ended, with many views of appropriate research and practice of architecture available. Shared concerns include an interest in materials, fabrication, and technology; drawing and geometry; theory and criticism; sustainability and climate change; and culture in an age of rapid change and globalization. They also include a commitment to design as it engages related disciplines aligned with architectural production, a view of the environment as an ecologically structured phenomenon, a regard for the fabrication processes of building, a perspective on new technologies and their impact on practice, and a concern for the spatial, temporal, social, and urban contexts of buildings. Given the varied perspectives from which the curriculum is conceived, an important aspect of the student’s development is to be able to establish links between different areas of focus and its many disciplines.

The focus of the MArch degree program is through architecture design studios integrated with supporting subjects central to the curriculum. While the professional curriculum specifies that a student study a range of subjects in several interrelated fields, students in the MArch program have some choice and are required to develop a concentration in a self-determined area. Required and elective subjects taught by the various discipline groups within the department and in other related departments offer a way of charting multiple paths for future professional possibilities. Therefore, students are expected to develop a cohesive structure for their individual educational interests within the MArch program at MIT beyond the core curriculum and toward the development of a design thesis.

Master of Science in Architecture Studies
This program is designed to provide a climate for research and inquiry that stresses the investigative component of understanding the built environment. It is open to students with professional degrees in architecture and to other university graduates in related fields. The SMArchS degree is awarded upon satisfactory completion of an approved program of study of 96 units and the completion of an acceptable thesis. The degree requires two full academic years of residency.

About half of the students in the SMArchS program come from outside the United States; this encourages the exchange of ideas across cultures. Students often use a site in their home countries as a base for their theses.

The program has a strong interest in the methods of inquiry, development and testing of knowledge, and the building and application of theory as it pertains to the built environment. It allows students to specialize in areas in which they wish to obtain particular abilities. There are several areas of study, and interdisciplinary work is encouraged.

The Architectural Design program nurtures research that contributes to current thinking about design in the field of architecture. It aims to advance architectural design by cultivating lateral thinking between design expertise and a range of allied fields, such as material sciences, media arts and technology, cultural studies, computation, sustainability, and emerging fabrication protocols. The program provides opportunity for designers to explore theoretical foundations of architectural design as well as its pedagogy, and to provide a platform for applied research and new forms of design practice.

In Architecture and Urbanism, design is developed and evaluated as a means to demonstrate the hypothesis that the urban space can be effectively constructed, and made legible and civic, through architecture. Areas of faculty interest include theory of urban form and design, urban ecology, and landscape.

The Aga Khan Program for Islamic Architecture supports students interested in pursuing research on architecture, architectural history, landscape, and urbanism in the Islamic world. Faculty interests include Islamic architectural and urban history and historiography, strategies for landscape and urban preservation, and the critique of contemporary architecture in Islamic countries.

The Computation group inquires into the varied nature and practice of computation in architectural design and the ways in which design meaning, intention, and knowledge are constructed through sensing, thinking, and making computationally. It focuses on developing innovative computational tools, processes, and theories, and applying them in creative, socially meaningful responses to challenging design problems.

Building Technology focuses on the intersection of design and technical issues for buildings that positively contribute to a more humane and environmentally responsible built world. Research within the group addresses innovative materials and assemblies, low-energy strategies for designing and operating buildings,
Students in History, Theory and Criticism work alongside doctoral students in the study of architecture and art together with historical and methodological issues that inform or link conceptual and practical work.

**Simultaneous Master's Degrees in Architecture and City Planning**

Students admitted to the Department of Architecture can propose a program of joint work in Architecture and Urban Studies and Planning that will lead to the simultaneous award of two degrees. Degree combinations may be MArch/Master in City Planning (MCP) or SMArchS/MCP. All candidates for simultaneous degrees must meet the requirements of both programs, but may submit a joint thesis. A student must apply by January 2 before beginning the last full year of graduate study in architecture. Dual-degree applications are submitted to Sonny Oram in 10-485. Students are first approved by the Dual-Degree Committee and then considered during the spring admissions process. For more information, contact Sonny Oram at 617-253-5115.

**Master of Science in Building Technology**

This program provides a focus for graduate students interested in the development and application of advanced technology for buildings and cities. Students in this program take relevant subjects in basic engineering disciplines along with subjects that apply these topics to the built environment. The program is open to qualified students with a degree in engineering or in architecture.

The program concentrates on the development of the next generation of technology for the built environment as well as the innovative application of state-of-the-art concepts to building and urban systems. Research programs, in many cases jointly carried out with faculty and students in the School of Engineering, include energy efficiency, sustainable building design, controls, natural ventilation and indoor air quality, innovative materials and structures, and computational simulation of building behavior.

The SMBT degree is generally completed in two years and requires 66 units of coursework and the completion of an acceptable thesis.

**Master of Science in Art, Culture and Technology**

ACT is an academic program and research center that explores art broadly and globally in historic and contemporary forms relating it to culture, science, technology, and design. It focuses on the development of artist-thinkers advancing their critical and production practices. Strong emphasis is placed on critical thinking, knowledge mining, and creative engagement, along with explorations of changing public and private spheres. Participation in faculty research, collaborations within the Institute, connections with visitors, and an ongoing studio seminar provide students with many opportunities to develop and exchange ideas. ACT maintains the Center for Advanced Visual Studies (CAVS) Archives, supported by its resources and grant funding, which preserves the legacy of the center and serves as a resource for scholars.

The SMACT degree requires four semesters of on-campus academic work including 156 units of coursework and the completion of a written thesis. For more information, visit the ACT website (http://act.mit.edu).

**Doctor of Philosophy**

The PhD in Architecture may be pursued in one of the following areas: History and Theory of Architecture/History and Theory of Art; Building Technology; or Design and Computation.

The PhD program in History, Theory and Criticism of Architecture and Art emphasizes the study of art, architecture, and urbanism, together with the historical and methodological issues that inform or link conceptual and practical work. The Aga Khan Program for Islamic Architecture is part of this doctoral program.

The doctoral program in Building Technology is interdepartmental, with important components in the Departments of Civil and Environmental Engineering and Mechanical Engineering. Research programs include energy efficiency, sustainable building design, controls, natural ventilation and indoor air quality, daylighting, masonry structures, innovative materials and structures, material and energy flows in urban areas, and computational simulation of building behavior.

The PhD program in Design and Computation is broadly conceived around computational ideas and digital technologies as they pertain to the understanding, description, generation, and construction of architectural form. Research topics include the mathematical foundations of shape and shape representation; generative tools for design synthesis; advanced modeling and visualization techniques; rapid prototyping and CAD/CAM technologies for physical fabrication; and the analysis of the design process and its enhancement through supporting technologies and workspaces. The mission of the program is to enrich design from a computational perspective, with clear implications for teaching and practice.

Admission and degree requirements vary somewhat in the specific areas listed above, and may be obtained from the Department of Architecture website or in correspondence with the separate areas. The residency requirement for the PhD is a minimum of two full academic years. Completion of all of the requirements for the PhD—including the dissertation—is usually accomplished in four to six years.

Each student admitted to work in the doctoral program consults closely with one principal professor in his or her area to develop a general plan of study. In all three areas, progress toward the PhD follows a sequence of required subject work, general examinations, and dissertation research, writing, and defense. Students are encouraged to take subjects appropriate to their study plans in other departments at MIT and at Harvard.
Urban Design Certificate
The Department of Architecture and the Department of Urban Studies and Planning jointly offer a Certificate in Urban Design. The purpose of the program is to provide the fundamental knowledge and special skills required to design urban and suburban environments. Students in the MArch, SMArchS, MCP, or Master of Science in Urban Studies and Planning programs are eligible for a Certificate in Urban Design if they complete a specific set of subjects drawn from the two departments.

Faculty and Teaching Staff
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Head, Department of Architecture

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Professors
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Mariana Ibañez, MArch
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Joan Jonas, MFA
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Edward Levine, MA, PhD
Professor Emeritus of Visual Arts

William Lyman Porter, MArch, PhD
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DEPARTMENT OF ARCHITECTURE

Maurice K. Smith, BArch
Professor Emeritus of Architecture

Jan Wampler, MArch
Professor Emeritus of Architecture

Krzysztof Wodiczko, MFA
Professor Emeritus of Visual Arts

Waclaw Piotr Zalewski
Professor Emeritus of Structures

Architecture Design

4.021 Introduction to Architecture Design
Prereq: None
U (Fall)
3-3-6 units. HASS-A
Credit cannot also be received for 4.02A

Provides an introduction to the architecture design process. Develops skills that enable design creativity, thinking, representation, and development. Beginning with abstract exercises, introduces techniques for designing and developing 2-dimensional and 3-dimensional form and space in architecture. Limited to 25; preference to Course 4 majors and minors, and first- and second-year students.

L. Bello Gomez, J. Jih

4.022 Architecture Design Foundations
Prereq: None
U (Spring)
3-3-6 units

Provides the foundations for architectural design. Focuses on design methodologies, formal and spatial analysis and the translation of creative conceptual strategies into architectural design propositions. Instruction in design skills, including digital and analogue representational techniques. Preference to Course 4 majors and minors.

Architecture Design Staff

4.023 Architecture Design Studio I
Prereq: 4.021, 4.022
U (Fall)
0-12-12 units

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 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 to Course 4 majors and minors.

C. Parreno

4.024 Architecture Design Studio II
Prereq: 4.023, 4.401, 4.500
U (Spring)
0-12-12 units

Provides instruction in architectural design and project development with an emphasis on social, cultural, or civic programs. Builds on foundational design skills with more complex constraints and contexts. Integrates aspects of architectural theory, building technology, and computation into the design process. Preference to Course 4 majors.

Architecture Design Staff

4.025 Architecture Design Studio III
Prereq: 4.024, 4.440[J]
U (Fall)
0-12-12 units

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. Focuses on how architectural concepts and ideas translate into built environments that transform the public sphere. Studio designed to prepare students for graduate studies in the field. Preference to Course 4 majors.

Architecture and Urbanism Staff
4.02A Introduction to Architecture Design Intensive
Prereq: None
U (IAP)
2-5-2 units. HASS-A
Credit cannot also be received for 4.021
Provides an introduction to the architecture design process. Develops skills that enable design creativity, thinking, representation, and development. Beginning with abstract exercises, introduces techniques for designing and developing 2-dimensional and 3-dimensional form and space in architecture. Limited to 25; preference to Course 4 majors and minors, and first- and second-year students.

J. Jih

4.031 Design Studio: Objects and Interaction
Prereq: None
U (Fall)
2-4-6 units
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 the role of technology in design. Provides a foundation in prototyping skills such as carpentry, casting, digital fabrication, electronics, and coding.

M. Coelho, J. Rosenkrantz

4.032 Design Studio: Information and Visualization
Subject meets with 4.033
Prereq: None
U (Fall, Spring)
2-4-6 units
Provides an 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. Graduate students are expected to complete additional assignments.

B. Fry

4.033 Design Studio: Information and Visualization (New)
Subject meets with 4.032
Prereq: None
G (Fall, Spring)
Units arranged
Provides an 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. Graduate students are expected to complete additional assignments.

B. Fry

4.091 Independent Study in Design
Prereq: None
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Staff

4.092 Independent Study in Design
Prereq: None
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Staff

4.093 Independent Study in Design
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Staff
4.094 Independent Study in Design
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Staff

4.100 Design Workshop: Fabricating Function
Prereq: None
U (IAP)
0-3-0 units
Through design and making, students discover the relationship between mind and hand and acquire the elemental skills necessary to research, conceptualize, represent, develop and fabricate design solutions to real-world problems. Covers the steps to creating and fabricating a functional object critical to understanding design and provides useful tools for problem solving in general. Lab fee. Limited to 15; preference to freshmen.
P. Pettigrew

4.101 Design Studio: Introduction to Design Techniques and Technologies
Prereq: None
U (Spring)
2-4-6 units
Introduces core principles, techniques and technologies for design across a wide range of media in a studio environment. Explores ideas related to form, materials, tools, systems, and structures through project-based exercises. Develops familiarity with design process, critical observation, and tools for the translation of design concepts into digital and physical constructs. Utilizing traditional and contemporary tools, faculty across various design disciplines expose students to a unique cross-section of inquiry.
C. Mueller, S. Tibbits

4.105 Geometric Disciplines and Architecture Skills I
Prereq: Permission of instructor
G (Fall)
2-2-5 units
Intensive introduction to architectural design tools and process, taught through a series of short exercises. Together with 4.107, covers a broad range of topics relating to the discourse of geometry as the basis of architectural design process. Focuses on projective drawings, explicit 3D modeling, and the reciprocity between representation and materialization. Lectures, workshops, and pin-ups address the architectural arguments intrinsic to geometry and its representation. Restricted to level one MArch students.

4.109 Materials and Fabrication for Architecture
Prereq: Permission of instructor
G (IAP)
0-3-3 units
Provides the material system knowledge and fabrication process skills to successfully engage with all areas of the shop, from precision handwork to multi-axis computer numerically controlled (CNC) machining. Progresses through a series of basic exercises that introduce the material and workflow, concluding with more complex problems that explore opportunities and issues specific to architecture. Lab fee. Limited to 12; preference to first-year MArch students.

4.110 Design Across Scales and Disciplines
Subject meets with MAS.650
Prereq: None
U (Spring)
2-0-10 units. HASS-A
Inspired by Charles and Ray Eames’ canonical Powers 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 4 minors.
N. Oxman, J. M. Yoon
**4.117 Creative Computation (New)**
Prereq: permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged

Architecture has a deep history of integrating drawing and making; however, the Albertian orthographic mandate has produced a schism in this reciprocal relationship. It has relegated architects to producing representations of architectural intent while handing over the responsibility of means and methods of making to builders. With recent advances in digital technologies, this relationship is once again becoming entangled. In doing so, it brings into question the renewed roles of architects, designers, creators, computers, and makers. Subject disputes the compartmentalization present in architectural practice today. Through the tools of computation and fabrication, it empowers students to design as architect, engineer, and craftsman.

*B. Clifford*

**4.119 Preparation for Undergraduate Architecture Design Thesis**
Prereq: 4.024
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
2-0-10 units

Selection of thesis topic, defining method of approach, and preparation of thesis proposal for BSA degree in architecture. Weekly class meeting as well as individual conference with faculty.

*Staff*

**4.120 Furniture Making Workshop**
Prereq: Permission of instructor
G (Spring)
2-2-5 units

Provides instruction in designing and building a functional piece of furniture from an original design. Develops woodworking techniques from use of traditional hand tools to digital fabrication. Gives students the opportunity to practice design without using a building program or code. Surveys the history of furniture making and includes site visits to local collections and artists/craftsmen. Limited to 12; preference to Course 4 students.

*C. Dewart*

**4.123 Architectural Assemblies (New)**
Prereq: None
G (Spring)
2-2-5 units

Fosters a holistic understanding of the architectural-building cycle, enabling students to build upon the history of design and construction to make informed decisions towards developing innovative building systems. Includes an overview of materials, processing methods, and their formation into building systems across cultures. Looks at developing innovative architectural systems focusing on the building envelope. Seeks to adapt processes from the aerospace and automotive industries to investigate buildings as prefabricated design and engineering assemblies. Synthesizes knowledge in building design and construction systems, environmental and structural design, and geometric and computational approaches.

*Architecture Design Staff*

**4.130 Architectural Design Theory and Methodologies**
Prereq: Permission of instructor
G (Fall)
3-3-6 units
Can be repeated for credit.

Studies design as an interrogative technique to examine material sciences, media arts and technology, cultural studies, computation and emerging fabrication protocols. Provides in-depth, theoretical grounding to the notion of ‘design’ in architecture, and to the consideration of contemporary design methodologies, while encouraging speculation on emerging design thinking. Topical focus varies with instructor. May be repeated for credit with permission of department.

*Architecture Design Staff*

**4.140[J] How to Make (Almost) Anything**
Same subject as 6.943[J], MAS.863[J]
Prereq: Permission of instructor
G (Fall)
3-9-6 units

See description under subject MAS.863[J].

*N. Gershenfeld, J. DiFrancesco, J. Lavallee, G. Darcey*
4.141 How to Design (almost) Anything
Subject meets with 4.142
Prereq: Permission of instructor
U (Spring)
3-9-6 units
Introduces fundamental design principles and practices, such as seeing, sketching, storytelling, prototyping and performing, as a way to demystify design as a discipline. Taught by a diverse group of faculty, students dive deeply into design through lectures, labs, and weekly project assignments. Technique-based class intended for students without a design background enables more effective collaboration with designers and the ability to apply the foundations of design to any discipline. Additional work required of students taking graduate version.
J. Lavallee, S. Tibbits

4.142 How to Design (almost) Anything
Subject meets with 4.141
Prereq: MAS.863[J] or permission of instructor
G (Spring)
3-9-6 units
Introduces fundamental design principles and practices, such as seeing, sketching, storytelling, prototyping and performing, as a way to demystify design as a discipline. Taught by a diverse group of faculty, students dive deeply into design through lectures, labs, and weekly project assignments. Technique-based class intended for students without a design background enables more effective collaboration with designers and the ability to apply the foundations of design to any discipline. Additional work required of students taking graduate version.
J. Lavallee, S. Tibbits

4.151 Architecture Design Core Studio I
Prereq: Permission of instructor
G (Fall)
0-12-9 units
Establishes foundational processes, techniques and attitudes towards architectural design. Includes projects of increasing scope and complexity engaging issues of structure, circulation, program, organization, building systems, materiality and tectonics. Develops methods of representation that incorporate both analogue and digital drawings and models. First in a sequence of design subjects, which must be taken in order. Limited to first-year MArch students.
W. O’Brien

4.152 Architecture Design Core Studio II
Prereq: 4.151
G (Spring)
0-12-9 units
Builds on Core I skills and expands the constraints of the architectural problem to include issues of urban site logistics, cultural and programmatic material (inhabitation and human factors), and long span structures. Two related projects introduce a range of disciplinary issues, such as working with precedents, site, sectional and spatial proposition of the building, and the performance of the outer envelope. Emphasizes the clarity of intentions and the development of appropriate architectural and representational solutions. Limited to first-year MArch students.
Architecture Design Staff

4.153 Architecture Design Core Studio III
Prereq: 4.152
G (Fall)
0-12-9 units
Interdisciplinary approach to design through studio design problems that engage the domains of building technology, computation, and the cultural/historical geographies of energy. Uses different modalities of thought to examine architectural agendas for ‘sustainability’; students position their work with respect to a broader understanding of the environment and its relationship to society and technology. Students develop a project with a comprehensive approach to programmatic organization, energy load considerations, building material assemblies, exterior envelope and structure systems. Limited to second-year MArch students.
S. Kennedy, M. Ibanez, C. Banon

4.154 Architecture Design Option Studio
Prereq: 4.153
G (Fall, Spring)
0-10-11 units
Can be repeated for credit.
Offers a broad range of advanced-level investigations in architectural design in various contexts, including international sites. Integrates theoretical and technological discourses into specific topics. Studio problems may include urbanism and city scale strategies, habitation and urban housing systems, architecture in landscapes, material investigations and new production technologies, programmatic and spatial complex building typologies, and research centered studies. Mandatory lottery process.
Architecture Design Staff
**4.162 Introductory Urban Design Studio**
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
0-10-11 units
Can be repeated for credit.

Project-based introduction to urban observation, research, analysis, and design. Focuses on urban elements, urban and architectural interventions, and landscape in existing cities. Emphasizes city form, sustainability, and social conditions. Projects require both conventional and digital techniques. Preference to Urbanism SMArchS students.

*M. Mazereeuw, A. Berger, F. Masoud*

**4.163[J] Urban Design Studio**
Same subject as 11.332[J]
Prereq: 4.162 or permission of instructor
G (Fall, Spring)
Units arranged
Can be repeated for credit.

The design of urban environments. Strategies for change in large areas of cities, to be developed over time, involving different actors. Fitting forms into natural, man-made, historical, and cultural contexts; enabling desirable activity patterns; conceptualizing built form; providing infrastructure and service systems; guiding the sensory character of development. Involves architecture and planning students in joint work; requires individual designs or design and planning guidelines.

*R. Segal, A. Berger*

**4.173[J] Beijing Urban Design Studio**
Same subject as 11.307[J]
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
0-18-0 units

*D. Frenchman*

**4.180 Architectural Design Workshop**
Prereq: 4.023 or permission of instructor
U (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Subject in design inquiry taught in studio format treating selected issues of the built world in depth. The problem may be prototypical or a particular aspect of a whole project, but always interdisciplinary in nature.

*Architectural Design Staff*

**4.181 Architectural Design Workshop**
Prereq: Permission of instructor
G (Fall; first half of term)
Units arranged
Can be repeated for credit.

Addresses design inquiry in a studio format. In-depth consideration of selected issues of the built world. The problem may be prototypical or a particular aspect of a whole project, but is always interdisciplinary in nature.

*A. García-Abril, W. Shu*

**4.182 Architectural Design Workshop**
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Addresses design inquiry in a studio format. In-depth consideration of selected issues of the built world. The problem may be prototypical or a particular aspect of a whole project, but is always interdisciplinary in nature.

*R. Segal*

**4.183-4.185 Architectural Design Workshop**
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Addresses design inquiry in a studio format. In-depth consideration of selected issues of the built world. The problem may be prototypical or a particular aspect of a whole project, but is always interdisciplinary in nature.

*Architecture Design Staff*
4.189 Preparation for MArch Thesis
Prereq: Permission of instructor
G (Fall, Spring, Summer)
3-1-5 units
Can be repeated for credit.
Preparatory research development leading to a well-conceived proposition for the MArch design thesis. Students formulate a cohesive thesis argument and critical project using supportive research and case studies through a variety of representational media, critical traditions, and architectural/artistic conventions. Group study in seminar and studio format, with periodic reviews supplemented by conference with faculty and a designated committee member for each individual thesis. Restricted to MArch students.
Architecture Design Staff

4.190 Practical Experience in Architecture
Prereq: Permission of instructor
G (Fall)
Units arranged [P/D/F]
Can be repeated for credit.
Practical experience through summer internships secured by the student in the field of architecture, urbanism, digital design, art, or building technology. Before registering for this subject, students must have an employment offer and complete an application signed by the advisor. Upon completion of the work, students must submit an employer evaluation form available from the departmental academic office. Registration limited to two summers. Restricted to Course 4 students.
Consult T. Miller

4.191 Independent Study in Architecture Design
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Design Staff

4.192 Independent Study in Architecture Design
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Design Staff

4.193 Independent Study in Architecture Design
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Design Staff

4.194 Independent Study in Architecture Design
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Design Staff

4.500 Special Subject: Design
Prereq: permission of instructor
U (Fall)
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Staff
4.S02 Special Subject: Design
Prereq: None
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Staff

4.S10 Special Subject: Architecture Design
Prereq: None
U (Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Design Staff

4.S11 Special Subject: Architecture Design
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Design Staff

4.S12 Special Subject: Architecture Design
Prereq: Permission of instructor
G (Fall, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Design Staff

4.S13 Special Subject: Architecture Design
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

J. Klein

4.S14 Special Subject: Architecture Design
Prereq: Permission of instructor
G (Fall)
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in architecture design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

M. Goulthorpe

Architecture Studies

4.210 Precedents in Critical Practice
Prereq: None
G (Fall)
3-0-6 units

Through formal analysis and discussion of historical and theoretical texts, seminar produces a map of contemporary architectural practice. Examines six pairs of themes in terms of their recent history: city and global economy, urban plan and map of operations, program and performance, drawing and scripting, image and surface, and utopia and projection. Restricted to year-one MArch students.
A. Miljacki

4.211[J] The Once and Future City
Same subject as 11.016[J]
Prereq: None
U (Spring)
3-0-9 units. HASS-H; CI-H

See description under subject 11.016[J]. Enrollment limited.
A. Spirn
4.213[J] Ecological Urbanism Seminar
Same subject as 11.308[J]
Prereq: Permission of instructor
G (Fall)
3-0-9 units
See description under subject 11.308[J]. Enrollment limited.
A. Spirn

4.214[J] Water, Landscape and Urban Design
Same subject as 11.314[J]
Prereq: Permission of instructor
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
3-3-6 units
Can be repeated for credit.
Workshop surveys how water affects the design of buildings, landscapes and cities in aesthetic, functional and symbolic ways. Combines the systematic study of water issues with urban design projects in South Asia and the US. Covers topics such as rainwater harvesting, water use efficiency, wastewater reuse, stormwater management, floodplain design, constructed wetlands, and waterfront development. Students work together to integrate these design concepts at the site, urban, and international scales. Limited to 15.
J. Wescoat

4.215[J] Sensing Place: Photography as Inquiry
Same subject as 11.309[J]
Prereq: None
G (Fall)
3-0-9 units
See description under subject 11.309[J]. Enrollment limited.
A. Spirn

4.216[J] Landscape and Urban Heritage Conservation
Same subject as 11.316[J]
Prereq: Permission of instructor
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
3-3-6 units
Can be repeated for credit.
Focuses on cultural landscape history, theory, and heritage issues and projects in the Indo-Islamic realm. Landscape and urban heritage inquiry go beyond monuments to encompass sites, cities, and regions. Combines the study of conservation theory and practice with an exploration of active urban landscape planning and design projects. Limited to 15.
J. Wescoat

4.217[J] Disaster Resilient Design
Same subject as 11.315[J]
Prereq: None
Acad Year 2017-2018: G (Fall)
Acad Year 2018-2019: Not offered
3-0-6 units
Seminar examines the linkages between natural hazards and environmental design. Engages theoretical debates about landscapes of risk, vulnerability, and resilience. Participants generate proposals for disaster resilience through combinations of retrofit, reconstruction, resettlement, commemorative, and anticipatory design. Methods include rapid bibliographic search, risk analysis, landscape synthesis, and comparative international methods. Projects vary and may focus on current crises or involve collaboration with the Aga Khan Development Network and other humanitarian organizations. Limited to 15.
J. Wescoat

4.221 Architecture Studies Colloquium
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
2-1-3 units
Series of open lectures, presented as an introduction to the diverse academic and creative community of MIT and the region, at which discipline groups of the SMArchS program converge and exchange ideas. Organized thematically, guest speakers from cultural and scientific fields present viewpoints in areas of emerging interest within design, building technology, architectural computation, history, and art. Encourages discourse with speakers and among students from different disciplines. Students initiate online debates among their peers and respond to an evolving series of discussions resulting in publication.
Architecture Staff

4.222 Professional Practice
Prereq: Permission of instructor
G (Fall)
3-0-3 units
Gives a critical orientation towards a career in architectural practice. Uses historical and current examples to illustrate the legal, ethical and management concepts underlying the practice of architecture. Emphasis on facilitating design excellence and strengthening connections between the profession and academia.
R. Mohr
4.225 Urban Design Theory
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
3-0-6 units
Introduces theories, concepts and precedents in urban design. Emphasizes traditional, modern and contemporary values and approaches to urban design. Research projects required. Preference to Urbanism SMArchS students.
M. Dennis

4.227 Landscapes of Energy
Prereq: Permission of instructor
G (Spring)
3-0-9 units
Spatializes large technological systems of energy, analyzes existing and speculative energy visions, and imagines energy futures in relation to concerns of ecology, politics, and aesthetics. Identifies different scales of thinking about the territory of energy from that of environmental systems, to cities, regions, and global landscapes. Readings and students’ research projects draw on critical geography, history of technology, environmental history to synthesize energy attributes within the design disciplines.
R. Ghosn

4.230[J] SIGUS Workshop
Same subject as 11.468[J]
Prereq: Permission of instructor
G (Fall, IAP)
Units arranged
Can be repeated for credit.
Interdisciplinary projects and interactive practices in urban settlement issues as investigated by MIT’s SIGUS (Special Interest Group in Urban Settlements), with a focus on developing countries throughout the world. Participation by guest practitioners. Additional work required of students taking the graduate version.
R. Goethert

4.231 SIGUS Workshop
Subject meets with 4.230[J], 11.468[J]
Prereq: Permission of instructor
U (Fall, IAP)
Units arranged
Can be repeated for credit.
Interdisciplinary projects and interactive practices in urban settlement issues as investigated by MIT’s SIGUS (Special Interest Group in Urban Settlements), with a focus on developing countries throughout the world. Participation by guest practitioners. Additional work required of students taking the graduate version.
R. Goethert

Same subject as 11.444[J]
Prereq: Permission of instructor
G (Spring)
3-0-6 units
Considers a new interdisciplinary paradigm of practice that regards dialogue among practitioners and users essential for efficacious and creative design and planning process. Focuses on non-traditional client groups: communities, the poor, and the generally excluded middle-income. Explores key issues confronting development practitioners, with stress on practical exercises drawn from current national and international case studies; e.g., an investigative comparison of cities or tools in coping with impending rapid and massive growth and expansion. Engages those with a design and community service orientation.
R. Goethert

4.236[J] Structuring Low-Income Housing Projects in Developing Countries
Same subject as 11.463[J]
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Examines dynamic relationship among key actors: beneficiaries, government, and funder. Emphasis on cost recovery, affordability, replicability, user selection, and project administration. Extensive case examples provide basis for comparisons.
R. Goethert
4.240[J] Urban Design Skills: Observing, Interpreting, and Representing the City
Same subject as 11.328[J]
Prereq: None
G (Fall)
4-2-9 units
See description under subject 11.328[J].
E. Ben-Joseph

Same subject as 11.330[J]
Subject meets with 4.251
Prereq: 4.252[J], 11.001[J], or permission of instructor
G (Spring)
Units arranged
Examines the complex development of cities through history by tracing a diachronic accumulation of forms and spaces in specific cities, and showing how significant ideas were made manifest across distinct geographies and cultures. Emphasizes how economic, spiritual, political, geographic and technological forces have simultaneously shaped and, in turn, been influenced by the city. Additional work required of students taking graduate version.
L. Jacobi, R. Segal

4.244[J] Urban Design Seminar: Perspectives on Contemporary Practice
Same subject as 11.333[J]
Prereq: None
G (Spring)
2-0-7 units
See description under subject 11.333[J].
Staff

4.245[J] DesignX Entrepreneurship (New)
Same subject as 11.245[J]
Prereq: Permission of instructor
G (IAP)
6-0-0 units
See description under subject 11.245[J]. Limited to 30; preference to students in DesignX Program.
D. Frenchman and G. Rosenzweig

4.246[J] DesignX Accelerator (New)
Same subject as 11.246[J]
Prereq: Permission of instructor
G (Spring)
2-4-6 units
See description under subject 11.246[J]. Limited to 30; preference to students in DesignX Program.
D. Frenchman, G. Rosenzweig

4.247[J] Urban Design Ideals and Action
Same subject as 11.337[J]
Prereq: 11.301[J] or permission of instructor
G (Spring)
2-0-7 units
See description under subject 11.337[J].
B. Ryan

4.250[J] Introduction to Urban Design and Development
Same subject as 11.001[J]
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
3-0-9 units. HASS-H
Examines the evolving structure of cities and the way that cities, suburbs, and metropolitan areas can be designed and developed. Surveys the ideas of a wide range of people who have addressed urban problems. Stresses the connection between values and design. Demonstrates how physical, social, political and economic forces interact to shape and reshape cities over time.
L. Vale

4.251 The Making of Cities
Subject meets with 4.241[J], 11.330[J]
Prereq: Permission of instructor
U (Spring)
3-0-9 units. HASS-H
Examines the complex development of cities through history by tracing a diachronic accumulation of forms and spaces in specific cities, and showing how significant ideas were made manifest across distinct geographies and cultures. Emphasizes how economic, spiritual, political, geographic and technological forces have simultaneously shaped and, in turn, been influenced by the city. Additional work required of students taking graduate version.
L. Jacobi, R. Segal
4.252[J] Introduction to Urban Design and Development
Same subject as 11.301[J]
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Examines both the physical and social structure of cities and ways they can be changed. Includes historical forces that have produced cities, models of urban form analysis, contemporary theories of urban design, implementation strategies. Core lectures supplemented by student projects analyzing the evolution of urban place, and factors of high quality urban design and development. Guest speakers present cases involving current projects illustrating the scope and methods of urban design practice.
D. Frenchman

4.253[J] Urban Design Politics
Same subject as 11.302[J]
Prereq: Permission of instructor
G (Spring)
3-0-9 units
See description under subject 11.302[J].
L. Vale

4.254[J] Real Estate Development Studio
Same subject as 11.303[J]
Prereq: Permission of instructor
G (Spring)
6-0-12 units
See description under subject 11.303[J].
D. Frenchman, K. Shen

4.255[J] Site and Environmental Systems Planning
Same subject as 11.304[J]
Prereq: Permission of instructor
G (Spring)
6-0-9 units
See description under subject 11.304[J].
M. A. Ocampo

4.257 Innovation for Disaster Relief and Preparedness
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
3-3-6 units
Explores innovative solutions for disaster relief and preparedness through both design and engineering. Interactive exercises provide an overview of large-scale disaster relief issues, including response communities, operating environments, logistics and technical challenges. Projects will be developed through hands-on prototyping, emphasizing the importance of system-oriented, sustainable design. Speakers from organizations such as FEMA and The Red Cross will contribute.
M. Mazereeuw

4.280 Undergraduate Architecture Internship
Prereq: Permission of instructor
U (IAP)
Units arranged [P/D/F]
Can be repeated for credit.
Students work in an architect’s office to gain experience, improve skills, and see the inner workings of an everyday architectural practice. Internships possible in all sizes of firms and in public and nonprofit agencies. During IAP, a full-time, 4-week internship is required; maximum IAP credit, 6 units.
Architecture Design Staff

4.286 SMArchS Urbanism Pre-Thesis Preparation (New)
Prereq: None
G (Spring)
3-0-0 units
Explores initial thesis ideas and bases for choosing among multiple interests. Assessment of design research strengths and weaknesses. Overview of conceptual frameworks and research methods. Preparation for summer field research and proposal development.
J. Wescoat

4.287 Graduate Architecture Internship
Prereq: Permission of instructor
G (IAP)
Units arranged [P/D/F]
Can be repeated for credit.
Work in an architect’s office to gain experience, improve skills, and see the inner workings of an everyday architectural practice. Internships possible in all sizes of firms and in public and nonprofit agencies. During IAP, a full-time, 4-week internship is required; maximum IAP credit, 6 units.
Architecture Design Staff
4.288 Preparation for SMArchS Thesis
Prereq: Permission of instructor
G (Fall, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

Students select thesis topic, define method of approach, and prepare thesis proposal for SMArchS degree. Faculty supervision on an individual or group basis. Intended for SMArchS program students prior to registration for 4.ThG.
Arch Design and Computation Staff

4.291 Independent Study in Architecture Studies
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Studies Staff

4.292 Independent Study in Architecture Studies
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Studies Staff

4.293 Independent Study in Architecture Studies
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Studies Staff

4.294 Independent Study in Architecture Studies
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Architecture Studies Staff

4.299 Summer Research Topics
Prereq: Permission of instructor
G (Summer)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary summer work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.
Staff

4.S20 Special Subject: Architecture Studies
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture studies that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Staff

4.S21 Special Subject: Architecture Studies
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in architecture studies that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Staff
4.522 Special Subject: Architecture Studies
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture studies that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Staff

4.523 Special Subject: Architecture Studies
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architecture studies that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
S. Kennedy

4.524 Special Subject: Architecture Studies
Prereq: Permission of instructor
G (Fall)
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in architecture studies that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
S. Tibbits

4.525 Special Subject: Urban Housing
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in urban housing that is not covered in the regular architecture curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
R. Goethert

4.526 Special Subject: City Form
Prereq: Permission of instructor
G (Fall, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in city form that is not covered in the regular architecture curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Architecture Staff

4.527 Special Subject: Urban Design
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in urban design that is not covered in the regular Architecture curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
R. Ghosn

Art, Culture and Technology

4.301 Introduction to Artistic Experimentation
Prereq: None
U (Fall, Spring)
3-3-6 units. HASS-A

Introduces artistic practice and critical visual thinking through three studio-based projects using different scales and media, for instance, “Body Extension,” “Shaping Time,” “Public Making,” and/or “Networked Cultures.” Each project concludes with a final presentation and critique. Students explore sculptural, architectural, performative artistic methods; video and sound art; site interventions and strategies for artistic engagement in the public realm. Lectures, screenings, guest presentations, field trips, readings, and debates supplement studio practice. Also introduces students to the historic, cultural, and environmental forces affecting both the development of an artistic vision and the reception of a work of art. Limited to 20.
Art, Culture & Technology Staff
4.302 Foundations in Art, Design, and Spatial Practices  
Prereq: 4.021 or 4.02A  
U (Spring)  
3-3-6 units  
Develops an introductory foundation in artistic practice and its critical analysis, and develops artistic approaches and methods by drawing analogies to architectural thinking, urbanism, and design practice. Covers how to communicate ideas and experiences on different scales and through two-dimensional, three-dimensional, and time-based media in new genres. Uses artistic methods that engage the public realm through spatial, sculptural, performative, and process-oriented practices. Instruction components include video screenings, guest lectures, visiting artist presentations, and field trips. Instruction and practice in written and oral communication provided. Enrollment limited; preference to Course 4 majors and minors.  
A. Aksamija

4.307 Art, Architecture, and Urbanism in Dialogue  
Subject meets with 4.308  
Prereq: 4.301, 4.302, or permission of instructor  
U (Fall)  
3-3-6 units  
Initiates a dialogue between architecture, urbanism, and contemporary art by focusing on the work of practitioners who intertwine the three disciplines in a critical spatial practice. Investigates themes and works ranging from early modernist practices to the contemporary and research based. Lectures, screenings, readings, and discussions with guests and faculty contribute to the development of group and individual projects and their presentation. Additional work required of students taking graduate version. Limited to 20.  
A. Aksamija

4.308 Art, Architecture, and Urbanism in Dialogue  
Subject meets with 4.307  
Prereq: Permission of instructor  
G (Fall)  
3-3-6 units  
Initiates a dialogue between architecture, urbanism, and contemporary art by focusing on the work of practitioners who intertwine the three disciplines in a critical spatial practice. Investigates themes and works ranging from early modernist practices to the contemporary and research based. Lectures, screenings, readings, and discussions with guests and faculty contribute to the development of group and individual projects and their presentation. Additional work required of students taking graduate version. Limited to 20.  
A. Aksamija

4.312 Advanced Studio on the Production of Space  
Subject meets with 4.313  
Prereq: 4.301, 4.302, or permission of instructor  
Acad Year 2017-2018: Not offered  
Acad Year 2018-2019: U (Fall)  
3-3-6 units, HASS-A  
Can be repeated for credit.  
Introduces historical and contemporary spatial concepts from various cultures and geo-political settings, and examines how they relate to artistic process and production. Explores the relational qualities of spatial concepts and reflects on their producers and proponents; investigates the notion of utopian, dystopian and heterotopian space, inner and outer space, the void, the vacuum, the in-between, and “real” versus “virtual” space. Lectures, readings, screenings, presentations, and guest speakers from various disciplines support the development of individual and collective projects. Additional work required of students taking the graduate version. Limited to 20.  
G. Urbonas

4.313 Advanced Studio on the Production of Space  
Subject meets with 4.312  
Prereq: Permission of instructor  
Acad Year 2017-2018: Not offered  
Acad Year 2018-2019: G (Fall)  
3-3-6 units  
Can be repeated for credit.  
Introduces historical and contemporary spatial concepts from various cultures and geo-political settings, and examines how they relate to artistic process and production. Explores the relational qualities of spatial concepts and reflects on their producers and proponents; investigates the notion of utopian, dystopian and heterotopian space, inner and outer space, the void, the vacuum, the in-between, and “real” versus “virtual” space. Lectures, readings, screenings, presentations, and guest speakers from various disciplines support the development of individual and collective projects. Additional work required of students taking the graduate version. Limited to 20.  
G. Urbonas
4.314 Advanced Workshop in Artistic Practice and Transdisciplinary Research
Subject meets with 4.315
Prereq: 4.301, 4.302, or permission of instructor
U (Fall)
3-3-6 units. HASS-A
Can be repeated for credit.

Examines artistic practice as a form of critical inquiry and knowledge production. Offers opportunity to develop art as a means for addressing the social, cultural, and ecological consequences of technology, to build bridges between industry and culture, and to challenge the boundaries between public and private, and human and non-human. Provides instruction in evaluating models of experimentation, individual research, and collaboration with other disciplines in the arts, culture, science, and technology. Supports the development of individual and collective artistic research projects. Additional work required of students taking the graduate version. Limited to 20.

G. Urbonas

4.315 Advanced Workshop in Artistic Practice and Transdisciplinary Research
Subject meets with 4.314
Prereq: Permission of instructor
G (Fall)
3-3-6 units
Can be repeated for credit.

Examines artistic practice as a form of critical inquiry and knowledge production. Offers opportunity to develop art as a means for addressing the social, cultural, and ecological consequences of technology, to build bridges between industry and culture, and to challenge the boundaries between public and private, and human and non-human. Provides instruction in evaluating models of experimentation, individual research, and collaboration with other disciplines in the arts, culture, science, and technology. Supports the development of individual and collective artistic research projects. Additional work required of students taking the graduate version. Limited to 20.

G. Urbonas

4.320 Introduction to Sound Creations
Subject meets with 4.321
Prereq: None
U (Spring)
3-3-6 units. HASS-A

Develops a critical awareness of how sound art as a field for artistic exploration is performed, produced, and distributed. Explores contemporary and historical practices that emerge outside of purely musical environments and investigates specific compositional developments of post-war modernity and electro-acoustic music, as well as non-musical disciplines related to the psychophysics of hearing and listening. Lectures, screenings, readings, and discussions with guests and faculty contribute to the development of group and individual projects. Additional work required of students taking the graduate version. Limited to 20.

Art, Culture and Technology Staff

4.321 Introduction to Sound Creations
Subject meets with 4.320
Prereq: None
G (Spring)
3-3-6 units

Develops a critical awareness of how sound art as a field for artistic exploration is performed, produced, and distributed. Explores contemporary and historical practices that emerge outside of purely musical environments and investigates specific compositional developments of post-war modernity and electro-acoustic music, as well as non-musical disciplines related to the psychophysics of hearing and listening. Lectures, screenings, readings, and discussions with guests and faculty contribute to the development of group and individual projects. Additional work required of students taking the graduate version. Limited to 20.

Art, Culture and Technology Staff

4.322 Introduction to Three-Dimensional Art Work
Subject meets with 4.323
Prereq: None
U (Fall)
3-3-6 units. HASS-A

Explores three-dimensional art work, including sculptures and installations, from design to model to finished piece. Addresses challenges associated with design and fabrication, process, context, and relationships between objects, the body, and physical or cultural environments. Lectures, screenings, field trips, readings, and debates supplement studio practice. Additional work required of students taking the graduate version. Limited to 20.

T. Putrih
4.323 Introduction to Three-Dimensional Art Work
Subject meets with 4.322
Prereq: None
G (Fall)
3-3-6 units

Explores three-dimensional art work, including sculptures and installations, from design to model to finished piece. Addresses challenges associated with design and fabrication, process, context, and relationships between objects, the body, and physical or cultural environments. Lectures, screenings, field trips, readings, and debates supplement studio practice. Additional work required of students taking the graduate version. Limited to 20.

_T. Putrih_

4.341 Introduction to Photography and Related Media
Subject meets with 4.342
Prereq: None
U (Fall, Spring)
3-3-6 units. HASS-A

Introduces history and contemporary practices in artistic photography through projects, lectures, artist visits, group discussions, readings, and field trips. Fosters visual literacy and aesthetic appreciation of photography/digital imaging, as well as critical awareness of how images in our culture are produced and constructed. Provides instruction in the fundamentals of different camera formats, film exposure and development, lighting, black and white darkroom printing, and digital imaging. Assignments allow for incorporation of a range of traditional and experimental techniques, development of technical skills, and personal exploration. Throughout the term, present and discuss projects in a critical forum. Additional work required of students taking the graduate version. Limited to 20.

_L. Baladi_

4.342 Introduction to Photography and Related Media
Subject meets with 4.341
Prereq: Permission of instructor
G (Fall, Spring)
3-3-6 units

Introduces history and contemporary practices in artistic photography through projects, lectures, artist visits, group discussions, readings, and field trips. Fosters visual literacy and aesthetic appreciation of photography/digital imaging, as well as critical awareness of how images in our culture are produced and constructed. Provides instruction in the fundamentals of different camera formats, film exposure and development, lighting, black and white darkroom printing, and digital imaging. Assignments allow for incorporation of a range of traditional and experimental techniques, development of technical skills, and personal exploration. Throughout the term, present and discuss projects in a critical forum. Additional work required of students taking the graduate version. Limited to 20.

_L. Baladi_

4.344 Advanced Photography and Related Media
Subject meets with 4.345
Prereq: 4.341 or permission of instructor
U (Fall, Spring)
3-3-6 units. HASS-A

Fosters critical awareness of how images in our culture are produced and constructed. Covers a range of experimental techniques and camera formats, advanced traditional and experimental black-and-white darkroom printing, and all aspects of digital imaging and output. Includes individual and group reviews, field trips, and visits from outside professionals. Topical focus changes each term; coursework centers on student-initiated project with emphasis on conceptual, theoretical, and technical development. Additional work required of students taking the graduate version. Equipment available for checkout. Limited to 20.

_L. Baladi_
4.345 Advanced Photography and Related Media
Subject meets with 4.344
Prereq: 4.342 or permission of instructor
G (Fall, Spring)
3-3-6 units
Can be repeated for credit.
Fosters critical awareness of how images in our culture are produced and constructed. Covers a range of experimental techniques and camera formats, advanced traditional and experimental black-and-white darkroom printing, and all aspects of digital imaging and output. Includes individual and group reviews, field trips, and visits from outside professionals. Topical focus changes each term; coursework centers on student-initiated project with emphasis on conceptual, theoretical, and technical development. Additional work required of students taking the graduate version. Equipment available for checkout. Limited to 20.
L. Baladi

4.352 Advanced Video and Related Media
Subject meets with 4.353
Prereq: 4.354 or permission of instructor
U (Spring)
3-3-6 units. HASS-A
Introduces advanced strategies of image and sound manipulation, both technical and conceptual. Covers pre-production planning (storyboards and scripting), refinement of digital editing techniques, visual effects such as chroma-keying, post-production, as well as audio and sonic components. Context provided by regular viewings of contemporary video artworks and other audio-visual formats. Students work individually and in groups to develop skills in media literacy and communication. Additional work required of students taking the graduate version. Limited to 20.
Art, Culture & Technology Staff

4.353 Advanced Video and Related Media
Subject meets with 4.352
Prereq: 4.355 or permission of instructor
G (Spring)
3-3-6 units
Introduces advanced strategies of image and sound manipulation, both technical and conceptual. Covers pre-production planning (storyboards and scripting), refinement of digital editing techniques, visual effects such as chroma-keying, post-production, as well as audio and sonic components. Context provided by regular viewings of contemporary video artworks and other audio-visual formats. Students work individually and in groups to develop skills in media literacy and communication. Additional work required of students taking the graduate version. Limited to 20.
Art, Culture & Technology Staff

4.354 Introduction to Video and Related Media
Subject meets with 4.355
Prereq: None
U (Spring)
3-3-6 units. HASS-A
Examines the technical and conceptual variables and strategies inherent in contemporary video art practice. Analyzes structural concepts of time, space, perspective, and sound within the art form. Building upon the historical legacy of film and other time-based image media, students render self-exploration, performance, social critique, and manipulation of raw experience into an aesthetic form. Emphasizes practical knowledge of lighting, video capturing and editing, and montage. Includes presentation and critique of student work, technical workshops, screenings, and readings with the objective of a final creative project. Additional work required of students taking the graduate version. Limited to 20.
Art, Culture & Technology Staff

4.355 Introduction to Video and Related Media
Subject meets with 4.354
Prereq: None
G (Spring)
3-3-6 units
Examines the technical and conceptual variables and strategies inherent in contemporary video art practice. Analyzes structural concepts of time, space, perspective, and sound within the art form. Building upon the historical legacy of film and other time-based image media, students render self-exploration, performance, social critique, and manipulation of raw experience into an aesthetic form. Emphasizes practical knowledge of lighting, video capturing and editing, and montage. Includes presentation and critique of student work, technical workshops, screenings, and readings with the objective of a final creative project. Additional work required of students taking the graduate version. Limited to 20.
Art, Culture & Technology Staff
4.356 Cinematic Migrations
Subject meets with 4.357
Prereq: 4.301, 4.302, 4.354 or permission of instructor
U (Fall)
3-3-6 units. HASS-A
Explores ideas and contexts behind moving images through a multifaceted look at cinema’s transmutations, emergence on local and national levels, and global migrations. Examines the transformation caused by online video, television, spatial installations, performances, dance, and many formats and portable devices, as well as the theory and context of film’s categorization, dissemination, and analysis. Presentations, screenings, field trips, readings, visiting artists, and experimental transdisciplinary projects broaden the perception of present cinema. Additional work required of students taking the graduate version. Limited to 12.
R. Green

4.357 Cinematic Migrations
Subject meets with 4.356
Prereq: 4.355 or permission of instructor
G (Fall)
3-3-6 units
Can be repeated for credit.
Explores ideas and contexts behind moving images through a multifaceted look at cinema’s transmutations, emergence on local and national levels, and global migrations. Examines the transformation caused by online video, television, spatial installations, performances, dance, and many formats and portable devices, as well as the theory and context of film’s categorization, dissemination, and analysis. Presentations, screenings, field trips, readings, visiting artists, and experimental transdisciplinary projects broaden the perception of present cinema. Additional work required of students taking the graduate version. Limited to 12.
R. Green

4.361 Performance Art Workshop
Subject meets with 4.362
Prereq: 4.301, 4.302, or permission of instructor
U (Spring)
3-3-6 units. HASS-A
Surveys performance in relation to media and to spatial structures imagined as settings for narrative movements, and uses video to explore the perception of sounds and images and how they are altered by various devices. Students design visual forms and performative actions, and make props or objects that embody aspects of their narratives. Activities include readings and screenings on the theoretical and historical background of performance art. Assignments lead to a final performance project. Additional work required of students taking graduate version. Limited to 20.
Art, Culture and Technology Staff

4.362 Performance Art Workshop
Subject meets with 4.361
Prereq: None
G (Spring)
3-3-6 units
Surveys performance in relation to media and to spatial structures imagined as settings for narrative movements, and uses video to explore the perception of sounds and images and how they are altered by various devices. Students design visual forms and performative actions, and make props or objects that embody aspects of their narratives. Activities include readings and screenings on the theoretical and historical background of performance art. Assignments lead to a final performance project. Additional work required of students taking graduate version. Limited to 20.
Art, Culture and Technology Staff
4.368 Studio Seminar in Art and the Public Sphere
Subject meets with 4.369
Prereq: 4.301 or 4.302
U (Spring)
3-3-6 units. HASS-A

Focuses on the production of artistic interventions in public space. Explores ideas, situations, objects, and materials that shape public space and inform the notion of publicness, with an emphasis on coproduction and cooperative ethics. Examines forms of environmental art in comparison to temporal and critical forms of art and action in the public sphere. Historical models include the Russian Constructivists, the Situationists International, ecosystematic aesthetics, conceptual art, and contemporary interventionist tactics and artistic strategies. Helps students develop an initial concept for a publicly-situated project. Includes guest lectures, visiting artist presentations, and optional field trips. Additional work required of students taking graduate version. Limited to 20.
G. Urbonas

4.369 Studio Seminar in Art and the Public Sphere
Subject meets with 4.368
Prereq: None
G (Spring)
3-3-6 units

Focuses on the production of artistic interventions in public space. Explores ideas, situations, objects, and materials that shape public space and inform the notion of publicness, with an emphasis on coproduction and cooperative ethics. Examines forms of environmental art in comparison to temporal and critical forms of art and action in the public sphere. Historical models include the Russian Constructivists, the Situationists International, ecosystematic aesthetics, conceptual art, and contemporary interventionist tactics and artistic strategies. Helps students develop an initial concept for a publicly-situated project. Includes guest lectures, visiting artist presentations, and optional field trips. Additional work required of students taking graduate version. Limited to 20.
G. Urbonas

4.373 Advanced Projects in Art, Culture and Technology
Subject meets with 4.374
Prereq: 4.301, 4.302, or permission of instructor
U (Spring)
3-3-6 units. HASS-A
Can be repeated for credit.

Investigates conceptual and formal issues in a variety of media. Explores representation, interpretation and meaning, and how these relate to historical, social and cultural contexts. Helps students develop an initial concept for a publicly situated project. Includes guest lectures and visiting artist presentations. Additional work required of students taking graduate version. Limited to 20.
Art, Culture and Technology Staff

4.374 Advanced Projects in Art, Culture and Technology
Subject meets with 4.373
Prereq: Permission of instructor
G (Spring)
3-3-6 units
Can be repeated for credit.

Investigates conceptual and formal issues in a variety of media. Explores representation, interpretation and meaning, and how these relate to historical, social and cultural contexts. Helps students develop an initial concept for a publicly situated project. Includes guest lectures and visiting artist presentations. Additional work required of students taking graduate version. Limited to 20.
Art, Culture and Technology Staff

4.388 Preparation for SMACT Thesis
Prereq: Permission of instructor
G (Spring, Summer)
3-0-6 units
Can be repeated for credit.

Aids students in the selection of a thesis topic, development of an approach method, preparation of a proposal that includes an outline for their thesis. Explores artistic practice as a method of critical inquiry and knowledge production/dissemination. Students examine artist writings and consider academic formats and standards. Regular group meetings, including peer reviews, are supplemented by independent study and individual conferences with faculty. Restricted to first-year SMACT students.
Art, Culture and Technology Staff
4.389 Tutorial for SMACT Thesis
Prereq: 4.388; Coreq: 4.THG
G (Spring)
3-0-6 units
Can be repeated for credit.

Series of tutorials that includes regular presentations of student writing in group critiques and supports independent thesis research and development by providing guidance on research strategy and written presentation. Sessions supplemented by regular individual conferences with thesis committee members. Restricted to second-year SMACT students.

Art, Culture and Technology Staff

4.390 Art, Culture and Technology Studio
Prereq: Permission of instructor
G (Fall, Spring)
3.0-6 units
Can be repeated for credit.

Explores the theory and criticism of intersections between art, culture, and technology in relation to contemporary artistic practice, critical design, and media. Students consider methods of investigation, documentation, and display and explore modes of communication across disciplines. Students develop projects in which they organize research methods and goals, engage in production, cultivate a context for their practice, and explore how to compellingly communicate, display, and document their work. Regular presentation and peer-critique sessions, as well as reviews involving ACT faculty and fellows, and external guest reviewers provide students with ample feedback as their projects develop. Restricted to SMACT students.

T. Putrih

4.391 Independent Study in Art, Culture and Technology
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Art, Culture and Technology Staff

4.392 Independent Study in Art, Culture and Technology
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Art, Culture and Technology Staff

4.393 Independent Study in Art, Culture and Technology
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Art, Culture and Technology Staff

4.394 Independent Study in Art, Culture and Technology
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Art, Culture and Technology Staff

4.390 Special Subject: Art, Culture and Technology
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in visual arts that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Art, Culture & Technology Staff
4.531 Special Subject: Art, Culture and Technology
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in visual arts that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Art, Culture & Technology Staff

4.532 Special Subject: Art, Culture and Technology
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in visual arts that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Art, Culture & Technology Staff

4.533 Special Subject: Art, Culture and Technology
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in visual arts that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
L. S. Liu

4.534 Special Subject: Art, Culture and Technology
Prereq: Permission of instructor
G (Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in visual arts that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Art, Culture & Technology Staff

Building Technology

4.401 Environmental Technologies in Buildings
Subject meets with 4.464
Prereq: None
U (Fall)
3-2-7 units

Introduction to the study of the thermal and luminous behavior of buildings. Examines the basic scientific principles underlying these phenomena and introduces students to a range of technologies and analysis techniques for designing comfortable indoor environments. Challenges students to apply these techniques and explore the role energy and light can play in shaping architecture. Additional work required of students taking the graduate version.
C. Reinhart

4.411[J] D-Lab Schools: Building Technology Laboratory
Same subject as EC.713[J]
Prereq: Physics I (GIR), Calculus I (GIR)
U (Fall)
2-3-7 units. Institute LAB

Focuses on the design, analysis, and application of technologies that support the construction of less expensive and better performing schools in developing countries. Prepares students to design or retrofit school buildings in partnership with local communities and NGOs. Strategies covered include daylighting, passive heating and cooling, improved indoor air quality via natural ventilation, appropriate material selection, and structural design. Investigations are based on application of engineering fundamentals, experiments and simulations. Case studies illustrate the role of technologies in reducing barriers to improved education.
L. K. Norford

Same subject as 1.044[J], 2.66[J]
Prereq: Physics I (GIR), Calculus II (GIR)
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
3-2-7 units. REST

Design-based introduction to energy and thermo-sciences, with applications to sustainable, energy-efficient architecture and building technology. Covers introductory thermodynamics, air/water/vapor mixtures, and heat transfer. Studies leading order factors in building energy use. Includes several building design projects in which students creatively employ energy fundamentals and building energy use.
L. R. Glicksman
Same subject as 2.52[J]
Prereq: 2.51
G (Fall)
3-0-9 units
See description under subject 2.52[J].
L. R. Glicksman

4.430 Daylighting and Solar Gain Control
Prereq: 4.464 or permission of instructor
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
Units arranged
Studies natural and electric lighting in an architectural context. Promotes the integration of occupant comfort, energy efficiency and daylight availability throughout the design process, with an emphasis on the role light can play in shaping architecture. Through group and individual projects, students practice design techniques, from rule of thumb simulations to high dynamic range photography and physical model building. Offered for 9 or 12 units.
C. Reinhart

4.431 Architectural Acoustics
Prereq: Permission of instructor
G (Spring)
Units arranged
Describes interactions between people and sound, indoors and outdoors, and uses this information to develop acoustical design criteria for architecture and planning. Principles of sound generation, propagation, and reception. Properties of materials for sound absorption, reflection, and transmission. Design implications for performance and gathering spaces. Use of computer modeling techniques.
Building Technology Staff

4.432 Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods
Subject meets with 4.433
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
3-2-7 units
Studies energy flows in and around groups of buildings from individual buildings to complete large-scale neighborhoods. Students use emerging digital techniques to analyze and influence building design interventions in relation to energy use for construction (embodied energy) and operation, access to daylight, and assessing walkability and outdoor comfort at the neighborhood scale. Additional work required of students taking the graduate version.
C. Reinhart

4.433 Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods
Subject meets with 4.432
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
3-2-4 units
Studies energy flows in and around groups of buildings from individual buildings to complete large-scale neighborhoods. Students use emerging digital techniques to analyze and influence building design interventions in relation to energy use for construction (embodied energy) and operation, access to daylight, and assessing walkability and outdoor comfort at the neighborhood scale. Additional work required of students taking the graduate version.
C. Reinhart

4.440[J] Building Structural Systems I
Same subject as 1.056[J]
Subject meets with 4.462
Prereq: Calculus II (GIR)
U (Spring)
3-3-6 units. REST
Introduces the design and behavior of large-scale structures and structural materials. Emphasizes the development of structural form and the principles of structural design. Presents design methods for timber, masonry, concrete and steel applied to long-span roof systems, bridges, and high-rise buildings. Includes environmental assessment of structural systems and materials. In laboratory sessions, students solve structural problems by building and testing simple models. Graduate and undergraduate students have separate lab sections.
J. Ochsendorf
4.450[J] Computational Structural Design and Optimization
Same subject as 1.575[J]
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
Units arranged
Research seminar focusing on cutting-edge applications of
computation for creative, early-stage structural design and
optimization for architecture. Incorporates computational design
fundamentals, including problem parameterization and formulation;
design space exploration strategies, including interactive, heuristic,
and gradient-based optimization; and computational structural
analysis methods, including the finite element method, graphic
statics, and approximation techniques. Case studies introduce and
investigate a range of historical and contemporary examples of
structural optimization in theory and practice.
C. Mueller

4.462 Building Structural Systems I
Subject meets with 1.056[J], 4.440[J]
Prereq: Permission of instructor
G (Spring)
3-2-4 units
Introduces the design and behavior of large-scale structures and
structural materials. Emphasizes the development of structural form
and the principles of structural design. Introduces design methods
for timber, masonry, concrete, and steel applied to long-span roof
systems, bridges, and high-rise buildings. Includes environmental
assessment of structural systems and materials. Laboratory to
solve structural problems by building and testing simple models.
Graduate and undergraduate students have separate lab sections.
J. Ochsendorf

4.463 Building Structural Systems II
Prereq: 4.440[J], 4.462, or permission of instructor
G (Fall)
3-2-4 units
Addresses advanced structures, exterior envelopes, and
contemporary production technologies. Continues the exploration
of structural elements and systems, expanding to include more
complex determinate, indeterminate, long-span, and high-
rise systems. Topics include reinforced concrete, steel and
engineered-wood design, and an introduction to tensile systems.
The contemporary exterior envelope is discussed with an emphasis
on the classification of systems, performance attributes, and
analysis techniques, material specifications and novel construction
technologies.
C. Mueller

4.464 Environmental Technologies in Buildings
Subject meets with 4.401
Prereq: None
G (Fall)
3-2-4 units
Introduction to the study of the thermal and luminous behavior of
buildings. Examines the basic scientific principles underlying these
phenomena and introduces students to a range of technologies and
analysis techniques for designing comfortable indoor environments.
Challenges students to apply these techniques and explore the role
energy and light can play in shaping architecture. Additional work
required of students taking the graduate version.
C. Reinhart

4.481 Building Technology Seminar
Prereq: Permission of instructor
G (Fall)
2-0-1 units
Fundamental research methodologies and ongoing investigations
in building technology to support the development of student
research projects. Topics drawn from low energy building design
and thermal comfort, building systems analysis and control,
daylighting, structural design and analysis, novel building materials
and construction techniques and resource dynamics. Organized as a
series of two- and three-week sessions that consider topics through
readings, discussions, design and analysis projects, and student
presentations.
L. R. Glicksman, C. Mueller, C. Reinhart, L. K. Norford

4.488 Preparation for S.M.B.T. Thesis
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.
Selection of thesis topic, definition of method of approach, and
preparation of thesis proposal. Independent study supplemented by
individual conference with faculty.
Building Technology Staff

4.489 Preparation for Building Technology Ph.D. Thesis
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.
Selection of thesis topic, definition of method of approach, and
preparation of thesis proposal. Independent study supplemented by
individual conference with faculty.
Building Technology Staff
4.491 Independent Study in Building Technology
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Building Technology Staff

4.492 Independent Study in Building Technology
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Building Technology Staff

4.493 Independent Study in Building Technology
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Building Technology Staff

4.494 Independent Study in Building Technology
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Building Technology Staff

4.540 Special Subject: Building Technology
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in building technology that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Building Technology Staff

4.541 Special Subject: Building Technology
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in building technology that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Building Technology Staff

4.542 Special Subject: Building Technology
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in building technology that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Building Technology Staff

4.543 Special Subject: Building Technology
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in building technology that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Building Technology Staff

4.544 Special Subject: Building Technology
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in building technology that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Building Technology Staff
4.545 Special Subject: Building Construction
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in building construction that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor. 
Building Technology Staff

4.546 Special Subject: Energy in Buildings
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in energy in buildings that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor. 
Building Technology Staff

4.547 Special Subject: Architectural Lighting
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in architectural lighting that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor. 
Building Technology Staff

4.548 Special Subject: Structural Design
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in structural design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor. 
Architecture Building Technology Staff

### Computation

4.500 Introduction to Design Computing
Subject meets with 4.512
Prereq: None
U (Fall)
2-2-8 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 applications, from 3D printing to CNC fabrication and 3D rendering. Includes weekly modeling assignments leading up to a final project. Additional work required of students taking the graduate version. Enrollment limited; preference to Course 4 majors and minors. 
L. Sass

4.501 Creative Design Prototyping
Prereq: 4.500
U (Spring)
2-2-8 units

Introduction to digital fabrication and online presentation as a single design process. Project-based class that integrates iterative design on paper with physical prototyping across many scales. Hands on learning of fabrication lab equipment integrated with design studio. It starts with machine learning through exercises quickly moving to a stepped design to production process: 3D printings, CNC machining and robotic finishing. The final product is an individually designed and fabricated functional piece of furniture. Preference to Course 4 majors and minors. 
L. Sass

4.502 Advanced Visualization: Architecture in Motion Graphics
Subject meets with 4.562
Prereq: 4.500 or permission of instructor
U (Fall)
3-2-7 units

Advanced projects in architectural visualization with an emphasis on the use of computer graphics animation and video production media. Workshop introduces advanced visualization software and teaches exploration of spatial expressions in motion graphics format. Students review and discuss selected literature and video materials on architecture and film. Additional work required of students taking the graduate version. Preference to Course 4 majors and minors. 
T. Nagakura
4.504 Design Scripting  
Subject meets with 4.564  
Prereq: 4.500  
U (Spring)  
2-2-8 units

Introduces fundamental ideas of computer programming and demonstrates their application to the process of visual and spatial design. Teaches methods for algorithmically modeling visual and spatial forms, evaluating their conditions, building interface, and processing formal data for prototyping, manufacturing, rendering, and other design tools. Proceeds through a sequence of scripting exercises in application programming environments. Each exercise requires a student to articulate computational tasks in the context of a design, and to write codes that produce graphic solutions. Additional work required of students taking the graduate version. 
T. Nagakura

4.507 Introduction to Building Information Modeling in Architecture  
Subject meets with 4.567  
Prereq: None  
U (Spring)  
3-2-7 units

Addresses fundamental methods, theories, and practices that engage contemporary modeling tools in the context of architectural design. Introduces selected academic and professional topics through lectures, demonstrations, and assignments. Topics include parametric modeling, component types and assembly, prototyping, scripting, and simulations. Initiates intellectual explorations in the use of building information modeling in research projects and design practices. Additional work required of students taking graduate version. 
T. Nagakura

4.511 Advanced Projects in Digital Fabrication  
Prereq: Permission of instructor  
G (Spring)  
Units arranged  
Can be repeated for credit.

Independent projects in the study of digital fabrication as it relates to architecture design. Students propose a project within one of the following areas of investigation: new materials, software design for makers, fabrication based modeling, robotic fabrication. 
L. Sass

4.512 Introduction to Design Computing (New)  
Subject meets with 4.500  
Prereq: None  
G (Fall)  
2-2-8 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 applications, from 3D printing to CNC fabrication and 3D rendering. Includes weekly modeling assignments leading up to a final project. Additional work required of students taking the graduate version. Enrollment limited. 
L. Sass

4.520 Visual Computing I  
Subject meets with 4.521  
Prereq: None  
U (Spring)  
3-0-9 units

Introduces a visual-perceptual, rule-based approach to design using shape grammars. Covers grammar fundamentals through lectures and in-class, exercises. Focuses on shape grammar applications, from stylistic analysis to creative design, through presentations of past applications and through short student exercises and projects. Presents computer programs for automating shape grammars. Additional work required of students taking graduate version. 
T. Knight

4.521 Visual Computing I  
Subject meets with 4.520  
Prereq: None  
G (Spring)  
3-0-6 units

Introduces a visual-perceptual, rule-based approach to design using shape grammars. Covers grammar fundamentals through lectures and in-class, exercises. Focuses on shape grammar applications, from stylistic analysis to creative design, through presentations of past applications and through short student exercises and projects. Presents computer programs for automating shape grammars. Additional work required of students taking graduate version. 
T. Knight
4.522 Visual Computing II
Subject meets with 4.523
Prereq: 4.520 or permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Spring)
3-0-9 units
Introduces advanced topics in shape grammar theory and applications. Includes an introductory component on shape grammars for students new to the area. Discusses generalizations of the shape grammar formalism that provide alternative ways of computing and representing designs. These include parametric grammars and parametric design, parallel grammars, and color grammars. Presents material through lectures and in-class, applied exercises. Additional work required of students taking the graduate version.
T. Knight

4.523 Visual Computing II
Subject meets with 4.522
Prereq: 4.520, 4.521 or permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
3-0-6 units
Introduces advanced topics in shape grammar theory and applications. Includes an introductory component on shape grammars for students new to the area. Discusses generalizations of the shape grammar formalism that provide alternative ways of computing and representing designs. These include parametric grammars and parametric design, parallel grammars, and color grammars. Presents material through lectures and in-class, applied exercises. Additional work required of graduate students.
T. Knight

4.540 Introduction to Shape Grammars I
Prereq: None
G (Fall)
3-0-6 units
An in-depth introduction to shape grammars and their applications in architecture and related areas of design. Shapes in the algebras $U_i j$, in the algebras $V_i j$ and $W_i j$ incorporating labels and weights, and in algebras formed as composites of these. Rules and computations, shape and structure, designs.
G. Stiny

4.541 Introduction to Shape Grammars II
Prereq: 4.540
G (Spring)
3-0-6 units
An in-depth introduction to shape grammars and their applications in architecture and related areas of design. Shapes in the algebras $U_i j$, in the algebras $V_i j$ and $W_i j$ incorporating labels and weights, and in algebras formed as composites of these. Rules and computations. Shape and structure. Designs.
G. Stiny

4.542 Background to Shape Grammars
Prereq: 4.541 or permission of instructor
G (Spring)
3-0-6 units
Can be repeated with permission of instructor.
An advanced examination of the shape grammar formalism and its relationship to some key issues in a variety of other fields, including art and design, philosophy, history and philosophy of science, linguistics and psychology, literature and literary studies, logic and mathematics, and artificial intelligence. Student presentations and discussion of selected readings are encouraged. Topics vary from year to year. Can be repeated with permission of instructor.
G. Stiny

4.550 Computational Design Lab
Subject meets with 4.570
Prereq: Permission of instructor
U (Spring)
Units arranged
Can be repeated for credit.
Provides students with an opportunity to explore projects that engage real world problems concerning spatial design, technology, media, and society. In collaboration with industry partners and public institutions, students identify topical issues and problems, and also explore and propose solutions through the development of new ideas, theories, tools, and prototypes. Industry and academic collaborators act as a source of expertise, and as clients and critics of projects developed during the term. General theme of workshop varies by semester or year. Open to students from diverse backgrounds in architecture and other design-related areas. Additional work required of students taking graduate version.
Computation Staff
4.552 Workshop in Architectural Computation
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for exploration of a topic in computation through research-focused design projects or exercises. Registration subject to prior arrangement of topic and supervision by staff.
Computation Staff

4.553 Workshop in Architectural Computation
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for exploration of a topic in computation through research-focused design projects or exercises. Registration subject to prior arrangement of topic and supervision by staff.
Computation Staff

4.557 City Science
Same subject as MAS.552
Prereq: Permission of instructor
G (Spring)
3-0-9 units
Can be repeated for credit.
See description under subject MAS.552.
K. Larson, R. Chin

4.562 Advanced Visualization: Architecture in Motion Graphics
Subject meets with 4.502
Prereq: Permission of instructor
G (Fall)
3-2-7 units
Advanced projects in architectural visualization with an emphasis on the use of computer graphics animation and video production media. Introduces advanced visualization software and teaches exploration of spatial expressions in motion graphics format. Students review and discuss selected literature and video materials on architecture and film. Additional work required of students taking the graduate version.
T. Nagakura

4.564 Design Scripting
Subject meets with 4.504
Prereq: Permission of instructor
G (Spring)
2-2-8 units
Introduces fundamental ideas of computer programming and demonstrates their application to the process of visual and spatial design. Teaches methods for algorithmically modeling visual and spatial forms, evaluating their conditions, building interface, and processing formal data for prototyping, manufacturing, rendering, and other design tools. Proceeds through a sequence of scripting exercises in application programming environments. Each exercise requires a student to articulate computational tasks in the context of a design, and to write codes that produce graphic solutions. Additional work required of students taking the graduate version.
T. Nagakura

4.566 Advanced Projects in Digital Media
Prereq: 4.562, 4.564, or permission of instructor
G (Fall, Spring)
Units arranged
Can be repeated for credit.
Develop independent projects in the study of digital media as it relates to architectural design. Students propose a project topic such as digital design tool, modeling and visualization, motion graphics, design knowledge representation and media interface.
T. Nagakura

4.567 Introduction to Building Information Modeling in Architecture
Subject meets with 4.507
Prereq: None
G (Spring)
Units arranged
Addresses fundamental methods, theories, and practices that engage contemporary modeling tools in the context of architectural design. Introduces selected academic and professional topics through lectures, demonstrations, and assignments. Topics include parametric modeling, component types and assembly, prototyping, scripting, and simulations. Initiates intellectual explorations in the use of building information modeling in research projects and design practices. Additional work required of students taking graduate version.
T. Nagakura
4.569[J] Designing Interactions
Same subject as CMS.834[J]
Subject meets with CMS.634
Prereq: None
G (Fall, Spring)
3-3-6 units
Can be repeated for credit.
See description under subject CMS.834[J]. Limited to 12.
F. Casalegno, T. Nagakura

4.570 Computational Design Lab
Subject meets with 4.550
Prereq: Permission of instructor
G (Spring)
Units arranged
Can be repeated for credit.
Provides students with an opportunity to explore projects that engage real world problems concerning spatial design, technology, media, and society. In collaboration with industry partners and public institutions, students identify topical issues and problems, and also explore and propose solutions through the development of new ideas, theories, tools, and prototypes. Industry and academic collaborators act as a source of expertise, and as clients and critics of projects developed during the term. General theme of workshop varies by semester or year. Open to students from diverse backgrounds in architecture and other design-related areas. Additional work required of students taking graduate version.
Computation Staff

4.580 Inquiry into Computation and Design
Prereq: None
G (Fall)
3-0-9 units
Explores the varied nature, history and practice of computation in design through lectures, readings, small projects, discussions, and guest visits by Computation group faculty and others. Topics may vary from year to year. Aims to help students develop a critical awareness of different approaches to and assumptions about computation in design beyond the specifics of techniques and tools, and to open avenues for further research.
T. Knight

4.581 Proseminar in Computation
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Can be repeated for credit.
Introduction to traditions of research in design and computation scholarship.
G. Stiny

4.582 Research Seminar in Computation
Prereq: 4.580 or permission of instructor
G (Fall, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
In-depth presentations of current research in design and computation.
G. Stiny

4.583 Forum in Computation
Prereq: Permission of Instructor
G (Fall, Spring)
3-0-0 units
Can be repeated for credit.
Group discussions and presentation of ongoing graduate student research in the Computation program.
T. Knight

4.584 Reading Seminar in Design and Computation
Prereq: Permission of instructor
G (Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Reading and discussion of particular topics in design and computation. Students lead discussions, make oral presentations, and prepare reviews of weekly readings.
T. Knight

4.587 SMArchS Computation Pre-Thesis Preparation
Prereq: 4.221 or permission of instructor
G (Spring)
3-0-3 units
Preliminary study in preparation for the thesis for the SMArchS degree in Computation. Topics include literature search, precedents examination, thesis structure and typologies, and short writing exercise.
T. Knight, T. Nagakura
4.589 Preparation for Design and Computation PhD Thesis
Prereq: Permission of instructor
G (Fall, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.


Computation Staff

4.591 Independent Study in Architectural Computation
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Computation Staff

4.592 Independent Study in Architectural Computation
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Computation Staff

4.593 Independent Study in Architectural Computation
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Computation Staff

4.594 Independent Study in Architectural Computation
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

Computation Staff

4.590 Special Subject: Architectural Computation
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Computation Staff

4.591 Special Subject: Architectural Computation
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Computation Staff

4.592 Special Subject: Architectural Computation
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

T. Knight

4.593 Special Subject: Architectural Computation
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Computation Staff

4.594 Special Subject: Architectural Computation
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.

Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

Computation Staff
4.S54 Special Subject: Architectural Computation
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

4.S55 Special Subject: Digital Fabrication
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

4.S56 Special Subject: Shape Grammars
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in computation and design that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

History, Theory and Criticism of Architecture and Art

4.601 Introduction to Art History
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
3-2-7 units. HASS-A
Introduction to the history and interpretation of western art that explores painting, graphic arts and sculpture from the Renaissance to the present. Engages diverse methodological perspectives to examine changing conceptions of art and the artist, and to investigate the plural meaning of artworks within the larger contexts of culture and history. Subject includes trips to local museums.

4.602 Modern Art and Mass Culture
Subject meets with 4.652
Prereq: None
Acad Year 2017-2018: U (Spring)
Acad Year 2018-2019: Not offered
4-0-8 units. HASS-A; CI-H
Introduction to theories of modernism and postmodernism and their related forms (roughly 18th century to present) in art and design. Focuses on how artists use the tension between fine art and mass culture to critique both. Examines visual art in a range of genres, from painting to design objects and "relational aesthetics." Works of art are viewed in their interaction with advertising, caricature, comics, graffiti, television, fashion, "primitive" art, propaganda, and networks on the internet. Additional work required of students taking graduate version.

4.603 Understanding Modern Architecture
Subject meets with 4.604
Prereq: None
U (Fall)
3-0-9 units. HASS-A
Examines modern architecture, art, and design in the context of the political, economic, aesthetic, and cultural changes that occurred in the twentieth century. Presents foundational debates about social and technological aspects of modern architecture and the continuation of those debates into contemporary architecture. Incorporates varied techniques of historical and theoretical analysis to interpret exemplary objects, buildings, and cities of modernity. Additional work required of students taking the graduate version. Preference to Course 4 majors and minors.

T. Hyde
4.604 Understanding Modern Architecture
Subject meets with 4.603
Prereq: Permission of instructor
G (Fall)
Units arranged
Examines modern architecture, art, and design in the context of the political, economic, aesthetic, and cultural changes that occurred in the twentieth century. Presents foundational debates about social and technological aspects of modern architecture and the continuation of those debates into contemporary architecture. Incorporates varied techniques of historical and theoretical analysis to interpret exemplary objects, buildings, and cities of modernity. Additional work required of students taking the graduate version. Preference to Course 4 majors.

T. Hyde

4.605 A Global History of Architecture
Subject meets with 4.650
Prereq: None
U (Spring)
4-0-8 units. HASS-A
Provides an outline of the history of architecture and urbanism from ancient times to the early modern period. Analyzes buildings as the products of culture and in relation to the special problems of architectural design. Stresses the geopolitical context of buildings and in the process familiarizes students with buildings, sites and cities from around the world. Additional work required of graduate students.

M. Jarzombek

4.606 Visual Perception and Art
Prereq: None
Acad Year 2017-2018: U (Spring)
Acad Year 2018-2019: Not offered
3-2-7 units. HASS-A; CI-H
Introduces visual perception from neurological, cultural, and artistic vantage points. Examines aspects of visual culture ranging from body adornment to public spaces, and from logotypes to moving images. Topics range from ritual space to forensics to machine-aided vision (cameras, radar devices, robotic scanners). Designed to develop skills in visual analysis and interpretation through lectures, oral presentations, field trips, and written essays. Enrollment limited.

C. Jones

4.607 Thinking About Architecture: In History and At Present
Prereq: 4.645 or permission of instructor
Acad Year 2017-2018: G (Fall)
Acad Year 2018-2019: Not offered
Units arranged
Studies the interrelationship of theory, history, and practice. Looks at theory not as specialized discourse relating only to architecture, but as touching on many issues, whether they be cultural, aesthetic, philosophical, or professional. Topics and examples are chosen from a wide range of materials, from classical antiquity to today.

M. Jarzombek

4.608 Seminar in the History of Art and Architecture
Subject meets with 4.609
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged
Examination of historical method in art and/or architecture, focusing on periods and problems determined by the research interest of the faculty member leading the seminar. Emphasizes critical reading and viewing and direct tutorial guidance. Additional work required of students taking the graduate version. Limited to 15.

HTC Staff

4.609 Seminar in the History of Art and Architecture
Subject meets with 4.608
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Spring)
3-0-9 units. HASS-A
Examination of historical method in art and/or architecture, focusing on periods and problems determined by the research interest of the faculty member leading the seminar. Emphasizes critical reading and viewing and direct tutorial guidance. Additional work required of students taking the graduate version. Limited to 15.

HTC Staff
4.610 Civic Islamic Architecture
Subject meets with 4.611
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Spring)
3-0-9 units. HASS-A
In-depth analysis of selected examples of architecture in the Islamic world from the 7th to the 21st century. Examines the effects of politics, culture, religion, technology, and fashion on the formation and development of Islamic architectural traditions and situates them diachronically and synchronically in world context. Additional work required of students taking the graduate version.
N. Rabbat

4.611 Civic Islamic Architecture
Subject meets with 4.610
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged
In-depth analysis of selected examples of architecture in the Islamic world from the 7th to the 21st century. Examines the effects of politics, culture, religion, technology, and fashion on the formation and development of Islamic architectural traditions and situates them diachronically and synchronically in world context. Additional work required of students taking the graduate version.
N. Rabbat

4.612 Islamic Architecture and the Environment
Prereq: Permission of instructor
Acad Year 2017-2018: G (Fall)
Acad Year 2018-2019: Not offered
3-0-6 units
Studies how Islamic architecture, landscape architecture, and urban planning reflect and transform environmental processes in various regions and climates of the Islamic world, from Andalusia to Southeast Asia, with an emphasis on South Asia, Central Asia, and the Middle East. Using systematic approaches to environmental data collection and analysis, examines strategies behind the design of selected architectural elements and landscape design types, ranging in scale from the fountain to the garden, courtyard, city, and agrarian region. Critically explores cultural interpretations of Islamic environmental design (e.g., paradise gardens), as they developed over time in ways that enrich, modify, or obscure their historical significance.
J. Wescoat

4.614 Building Islam
Prereq: None
U (Fall)
3-0-9 units. HASS-A
Examines the history of Islamic architecture and culture spanning fifteen centuries on three continents - Asia, Africa, Europe. Students study a number of representative examples, from the 7th century House of the Prophet to the current high-rises of Dubai, in conjunction with their urban, social, political, and intellectual environments at the time of their construction.
N. Rabbat

4.616 Selected Topics on Culture and Architecture
Prereq: Permission of instructor
G (Spring)
Units arranged
Seminar on how culture interacts with architecture. Analyzes architecture as a conveyor of messages that transcend stylistic, formal, and iconographic concerns to include an assessment of disciplinary, political, ideological, social, and cultural factors. Critically reviews methodologies and theoretical premises of studies on culture and meaning. Focuses on examples from Islamic history and establishes historical and theoretical frameworks for investigation.
N. Rabbat

4.617 Topics in Islamic Urbanism
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged
Seminar on selected topics from the history of Islamic urbanism. Examines patterns of settlement, urbanization, development, and architectural production in various places and periods, ranging from the formative period in the 7th century to the new cities emerging today. Discusses the leading factors in shaping and transforming urban forms, design imperatives, cultural and economic structures, and social and civic attitudes. Critically analyzes the body of literature on Islamic urbanism. Research paper required.
N. Rabbat
4.619 Historiography of Islamic Architecture
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
3-0-9 units

Critical review of literature on Islamic art and architecture in the last two centuries. Analyzes the cultural, disciplinary, and theoretical contours of the field and highlights the major figures that have influenced its evolution. Challenges the tacit assumptions and biases of standard studies of Islamic art and architecture and addresses historiographic and critical questions concerning how knowledge of a field is defined, produced, and reproduced.

N. Rabbat

4.621 Orientalism and Representation
Prereq: Permission of instructor
Acad Year 2017-2018: G (Fall)
Acad Year 2018-2019: Not offered
Units arranged

Seminar on the politics of representation with special focus on Orientalist traditions in architecture, art, literature, and scholarship. Critically analyzes pivotal texts, projects, and artworks that reflected the encounters between the West and the Orient from Antiquity to the present. Discusses how political, ideological, and religious attitudes informed the construction and reproduction of Western knowledge about the Islamic world as well as revisionist Eastern self-representations. Research paper required.

N. Rabbat

4.622 Islamic Gardens and Geographies
Subject meets with 4.623
Prereq: Permission of instructor
Acad Year 2017-2018: U (Spring)
Acad Year 2018-2019: Not offered
3-0-9 units

Seminar focuses on the historical geography of Islamic gardens, from Andalusia to Southeast Asia, with an emphasis on the Indian subcontinent. Critically engages evidence from archaeological, art historical, and cartographic sources, and explores strategies for generating integrative accounts of historical landscapes. Topics include gardens, cities, cultural landscapes, and political territories, along with their contemporary significance for cultural heritage conservation and design. Additional work required of graduate students. Limited to 15.

J. Wescoat

4.623 Islamic Gardens and Geographies
Subject meets with 4.622
Prereq: Permission of instructor
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
3-0-9 units

Seminar focuses on the historical geography of Islamic gardens, from Andalusia to Southeast Asia, with an emphasis on the Indian subcontinent. Critically engages evidence from archaeological, art historical, and cartographic sources, and explores strategies for generating integrative accounts of historical landscapes. Topics include gardens, cities, cultural landscapes, and political territories, along with their contemporary significance for cultural heritage conservation and design. Additional work required of graduate students. Limited to 15.

J. Wescoat

4.625 Water Planning, Policy, and Design
Same subject as 11.378
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
Units arranged
Can be repeated for credit.

Focuses on water in environmental planning, policy, and design. Draws together faculty and students who are working on water-related research projects to develop and maintain a current perspective on the field from the site to metropolitan and international scales. Limited to 15.

J. Wescoat

4.633 Locating Capitalism: Producing Cities and Objects
Prereq: Permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged

Explores what defines the parameters of a profit economy in historic Europe. Discusses major interpretive frameworks that historically have guided scholarship in architectural, art, and economic history. Traces the core themes of commodification, production, and consumption - analyzing the relevance of studies on pre- and early modern globalization - to the culture and time under consideration. Can be taken for 9 or 12 units.

L. Jacobi
4.634 Early Modern Architecture and Art
Subject meets with 4.635
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
Units arranged
Presents a history, from the 14th through the early 17th century, of architectural practice and design, as well as visual culture in Europe with an emphasis on Italy. Topics include the production and reception of buildings and artworks; the significance of a reinvigorated interest in antiquity; and representation of the individual, the state, and other institutions. Examines a variety of interpretive methods. Graduate students are expected to complete additional assignments.
L. Jacobi

4.635 Early Modern Architecture and Art
Subject meets with 4.634
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
3-0-9 units. HASS-A
Presents a history, from the 14th through the early 17th century, of architectural practice and design, as well as visual culture in Europe with an emphasis on Italy. Topics include the production and reception of buildings and artworks; the significance of a reinvigorated interest in antiquity; and representation of the individual, the state, and other institutions. Examines a variety of interpretive methods. Graduate students are expected to complete additional assignments.
L. Jacobi

4.636 Topics in Western Medieval Architecture and Art (New)
Subject meets with 4.637
Prereq: None
Acad Year 2017-2018: U (Fall)
Acad Year 2018-2019: Not offered
3-0-9 units
Investigates architecture and art in medieval Europe, including significant monuments, art objects, themes, and developments from late antiquity through the rise of European cities in the 13th century. Considers a variety of media, ranging from stone- and metalwork to parchment and glass. Topics include sacred places and spaces; pilgrimage; relics and souvenirs; iconoclasm; questions of materiality, agency, and the power associated with objects; nature and magic; visions; medieval conceptions of temporality; and the construct of feudalism. Students taking graduate version complete additional assignments.
L. Jacobi

4.637 Topics in Western Medieval Architecture and Art (New)
Subject meets with 4.636
Prereq: None
Acad Year 2017-2018: G (Fall)
Acad Year 2018-2019: Not offered
Units arranged
Investigates architecture and art in medieval Europe, including significant monuments, art objects, themes, and developments from late antiquity through the rise of European cities in the 13th century. Considers a variety of media, ranging from stone- and metalwork to parchment and glass. Topics include sacred places and spaces; pilgrimage; relics and souvenirs; iconoclasm; questions of materiality, agency, and the power associated with objects; nature and magic; visions; medieval conceptions of temporality; and the construct of feudalism. Students taking graduate version complete additional assignments.
L. Jacobi

4.640 Advanced Study in Critical Theory of Architecture
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.
Seminar on a selected topic in critical theory. Requires original research and presentation of oral and written report.
M. Jarzombek

4.641 19th-Century Art
Subject meets with 4.644
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Spring)
4-0-8 units. HASS-A
Survey of visual culture from the late 18th century to 1900 with an emphasis on Western Europe and its global points of contact. Topics include art and revolution, empire and its image, mythologies of the artist, gender and representation, public exhibitions, the dealer/critic system, and the emergence of the avant-garde. Strikes a balance between historical and contemporary critical perspectives to assess art's engagement with social and political experience of modernity. Additional work required of students taking the graduate version.
K. Smentek
4.644 19th-Century Art
Subject meets with 4.641
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Spring)
Units arranged
Survey of visual culture from the late 18th century to 1900 with an emphasis on Western Europe and its global points of contact. Topics include art and revolution, empire and its image, mythologies of the artist, gender and representation, public exhibitions, the dealer/critic system, and the emergence of the avant-garde. Strikes a balance between historical and contemporary critical perspectives to assess art’s engagement with social and political experience of modernity. Additional work required of students taking the graduate version.
K. Smentek

4.645 Selected Topics in Architecture: 1750 to the Present
Prereq: 4.210 or permission of instructor
G (Spring)
3-0-6 units
General study of modern architecture as a response to important technological, cultural, environmental, aesthetic, and theoretical challenges after the European Enlightenment. Focus on the theoretical, historiographic, and design approaches to architectural problems encountered in the age of industrial and post-industrial expansion across the globe, with specific attention to the dominance of European modernism in setting the agenda for the discourse of a global modernity at large. Explores modern architectural history through thematic exposition rather than as simple chronological succession of ideas.
A. Dutta

4.646 Advanced Study in the History of Modern Architecture and Urbanism
Prereq: Permission of instructor
G (Spring)
Units arranged
Can be repeated for credit.
Seminar in a selected topic in the history of modern architecture and urbanism. Oral presentations and research paper required.
T. Hyde

4.647 Technopolitics, Culture, Intervention
Prereq: 4.645 or permission of instructor
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
Units arranged
Examines the manner in which key theories of technology have influenced architectural and art production in terms of their “humanizing” claims. Students test theories of technology on the grounds of whether technology is good or bad for humans. Limited to 15; preference to MArch students.
A. Dutta

Same subject as 21A.507[J]
Subject meets with 4.649[J], 21A.519[J]
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
3-0-9 units. HASS-A
Examines the sonic phenomena and experiences that motivate scientific, humanistic, and artistic practices. Explores the aesthetic and technical aspects of how we hear; measure or describe vibrations; record, compress, and distribute resonating materials; and how we ascertain what we know about the world through sound. Although the focus is on sound as an aesthetic, social, and scientific object, the subject also investigates how resonance is used in the analysis of acoustics, architecture, and music theory. Students make a sonic artifact or research project as a final requirement. Students taking graduate version complete additional assignments.
S. Helmreich, C. Jones

Same subject as 21A.519[J]
Subject meets with 4.648[J], 21A.507[J]
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: G (Fall)
3-0-9 units
Examines the sonic phenomena and experiences that motivate scientific, humanistic, and artistic practices. Explores the aesthetic and technical aspects of how we hear; measure or describe vibrations; record, compress, and distribute resonating materials; and how we ascertain what we know about the world through sound. Although the focus is on sound as an aesthetic, social, and scientific object, the subject also investigates how resonance is used in the analysis of acoustics, architecture, and music theory. Students make a sonic artifact or research project as a final requirement. Students taking graduate version complete additional assignments.
S. Helmreich, C. Jones
4.650 A Global History of Architecture
Subject meets with 4.605
Prereq: None
G (Spring)
4-0-8 units
Provides an outline of the history of architecture and urbanism from ancient times to the early modern period. Analyzes buildings as the products of culture and in relation to the special problems of architectural design. Stresses the geopolitical context of buildings and in the process familiarizes students with buildings, sites and cities from around the world. Additional work required of graduate students.
M. Jarzombek

4.651 Art Since 1940
Prereq: None
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Spring)
3-0-9 units. HASS-A
Critical examination of major developments in European, Asian, and American art from 1940 to the present. Surveys the mainstream of art production but also examines marginal phenomena (feminism, identity politics, AIDS activism, net art) that come to change the terms of arts engagements with civic culture. Visits to area art museums and writing assignments develop skills for visual analysis and critical writing.
C. Jones

4.652 Modern Art and Mass Culture
Subject meets with 4.602
Prereq: None
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
Units arranged
Introduction to theories of modernism and postmodernism and their related forms (roughly 18th century to present) in art and design. Focuses on how artists use the tension between fine art and mass culture to critique both. Examines visual art in a range of genres, from painting to design objects and “relational aesthetics.” Works of art are viewed in their interaction with advertising, caricature, comics, graffiti, television, fashion, “primitive” art, propaganda, and networks on the internet. Additional work required of students taking the graduate version.
C. Jones

4.657 Design: The History of Making Things
Prereq: None
U (Spring)
5-0-7 units. 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 assesses the dynamic interaction of design with politics, economics, technology, and culture in the past and at present. Limited to 36.
T. Hyde, K. Smentek

4.661 Theory and Method in the Study of Architecture and Art
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Can be repeated for credit.
Studies theoretical and historiographical works pertaining to the fields of art and architectural history. Members of seminar pursue work designed to examine their own presuppositions and methods. Open only to PhD candidates and other advanced students.
A. Dutta

4.670 Nationalism, Internationalism, and Globalism in Modern Art
Subject meets with 4.671
Prereq: None
Acad Year 2017-2018: G (Spring)
Acad Year 2018-2019: Not offered
Units arranged
Studies how international modernism interacted with the concept of "nation" and how contemporary discourses concerning globalization changes that dynamic. Looks at how art uses and critiques globalization on various levels. Seminar attendance and visits to art museums required. Research paper required of students taking the graduate version.
C. Jones
4.671 Nationalism, Internationalism, and Globalism in Modern Art
Subject meets with 4.670
Prereq: 4.601 or permission of instructor
Acad Year 2017-2018: U (Spring)
Acad Year 2018-2019: Not offered
3-1-8 units
Studies how international modernism interacted with the concept of “nation” and how contemporary discourses concerning globalization changes that dynamic. Looks at how art uses and critiques globalization on various levels. Seminar attendance and visits to art museums required. Research paper required of students taking the graduate version.
C. Jones

4.675 Collect, Classify, Consume
Prereq: None
G (Spring)
Units arranged
Can be repeated for credit.

Historical study of collecting from the Renaissance to the present. Addresses the practices of collecting and display at the both the individual and institutional level, and analyzes their social, aesthetic, scientific, political and economic dimensions. Specific themes vary from year to year. Offered for 9 or 12 units. May be repeated for credit with permission of instructor.
K. Smentek

4.677 Advanced Study in the History of Art
Prereq: Permission of instructor
G (Fall)
Units arranged
Can be repeated for credit.

Seminar in a selected topic in the history of art, with a particular emphasis on developments from the 18th century to the present. Oral presentations and research paper required. Offered for 9 or 12 units.
K. Smentek

4.683 Preparation for HTC Qualifying Paper
Prereq: Permission of instructor
G (Fall, Spring)
Units arranged [P/D/F]
Required of doctoral students in HTC as a prerequisite for work on the doctoral dissertation. The qualifying paper is a scholarly article fit to be published in a peer-reviewed journal that is the result of research in the history, theory and criticism of architecture and art. Topic may not be in the area of the proposed thesis. Work is done in consultation with HTC faculty, in accordance with the HTC PhD Degree Program Guidelines. Restricted to HTC PhD students.
HTC Staff

4.684 Preparation for HTC Major Exam
Prereq: permission of instructor
G (Fall, Spring)
Units arranged [P/D/F]
Required of doctoral students in HTC as a prerequisite for work on the doctoral dissertation. The Major Exam covers a historically broad area of interest and includes components of history, historiography, and theory. Preparation for the exam will focus on four or five themes agreed upon in advance by the student and the examiner, and are defined by their area of teaching interest. Work is done in consultation with HTC faculty, in accordance with the HTC PhD Degree Program Guidelines. Restricted to HTC PhD students.
HTC Staff

4.685 Preparation for HTC Minor Exam
Prereq: permission of instructor
G (Fall, Spring)
Units arranged [P/D/F]
Required of doctoral students in HTC as a prerequisite for work on the doctoral dissertation. The Minor Exam focuses on a specific area of specialization through which the student might develop their particular zone of expertise. Work is done in consultation with HTC faculty, in accordance with the HTC PhD Degree Program Guidelines. Restricted to HTC PhD students.
HTC Staff

4.686 SMArchS AKPIA Pre-Thesis Preparation
Prereq: 4.221; 4.619 or 4.621
G (Fall, Spring)
0-1-2 units
Preliminary study in preparation for the thesis for the SMArchS degree in the Aga Khan Program for Islamic Architecture. Topics include literature search, precedents examination, thesis structure and typologies, and short writing exercise.
N. Rabbat, J. Wescoat
4.687 SMArchS HTC Pre-Thesis Preparation
Prereq: 4.221, 4.661
G (Fall, Spring)
0-1-2 units
Preliminary study in preparation for the thesis for the SMArchS degree in History, Theory and Criticism. Topics include literature search, precedents examination, thesis structure and typologies, and short writing exercise.

HTC Staff

4.689 Preparation for History, Theory, and Criticism - Ph.D. Thesis
Prereq: Permission of instructor
G (Fall, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.
Required for doctoral students in HTC as a prerequisite for work on the doctoral dissertation. Prior to candidacy, doctoral students are required to write and orally defend a proposal laying out the scope of their thesis, its significance, a survey of existing research and literature, the methods of research to be adopted, a bibliography and plan of work. Work is done in consultation with HTC Faculty, in accordance with the HTC PhD Degree Program guidelines. Restricted to HTC PhD students.

HTC Staff

4.691 Independent Study in the History, Theory, and Criticism of Architecture and Art
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

HTC Staff

4.692 Independent Study in the History, Theory, and Criticism of Architecture and Art
Prereq: Permission of instructor
U (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual or group basis. Registration subject to prior arrangement for subject matter and supervision by staff.

HTC Staff

4.693 Independent Study in the History, Theory, and Criticism of Architecture and Art
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged
Can be repeated for credit.
Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

HTC Staff

4.694 Independent Study in the History, Theory, and Criticism of Architecture and Art
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.
Supplementary work on individual basis. Registration subject to prior arrangement for subject matter and supervision by staff.

HTC Staff

4.693 Independent Study in the History, Theory, and Criticism of Architecture and Art
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

HTC Staff

4.694 Special Subject: History, Theory and Criticism of Architecture and Art
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

HTC Staff

4.695 Special Subject: History, Theory and Criticism of Architecture and Art
Prereq: None
U (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.

HTC Staff
Prereq: Permission of instructor
G (Spring)
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
C. Jones

4.S63 Special Subject: History, Theory and Criticism of Architecture and Art
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
HTC Staff

4.S64 Special Subject: History, Theory and Criticism of Architecture and Art
Prereq: Permission of instructor
G (Fall, IAP, Spring)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of architecture and art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
HTC Staff

4.S65 Special Subject: Advanced Study in Islamic Architecture
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in Islamic or non-western architecture that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports, varying at the discretion of the instructor.
HTC Staff

4.S66 Special Subject: History, Theory and Criticism of Art
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
HTC Staff

4.S67 Special Subject: Study in Modern Art
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of modern art that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Staff

4.S68 Special Subject: Study in Modern Architecture
Prereq: Permission of instructor
G (Fall)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Seminar or lecture on a topic in the history, theory and criticism of modern architecture that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor.
Staff
4S69 Special Subject: Advanced Study in the History of Urban Form
Prereq: Permission of instructor
G (IAP, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.

Seminar or lecture on a topic in the history, theory and criticism of urban form that is not covered in the regular curriculum. Requires original research and presentation of oral and written reports and/or design projects, varying at the discretion of the instructor. HTC Staff

Thesis and UROP

Graduate Subjects

4THG Graduate Thesis
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Units arranged
Can be repeated for credit.

Program of research and writing of thesis; to be arranged by the student with supervising committee. Staff

Undergraduate Subjects

4119 Preparation for Undergraduate Architecture Design Thesis
Prereq: 4.024
Acad Year 2017-2018: Not offered
Acad Year 2018-2019: U (Fall)
2-0-10 units

Selection of thesis topic, defining method of approach, and preparation of thesis proposal for BSA degree in architecture. Weekly class meeting as well as individual conference with faculty. Staff

Same subject as 11.THT[J]
Prereq: None
U (Fall)
3-0-9 units
Can be repeated for credit.

See description under subject 11.THT[J]. C. Abbanat

4THU Undergraduate Thesis
Prereq: 4.THT[J] or 4.119
U (Fall, IAP, Spring, Summer)
Units arranged
Can be repeated for credit.

Program of thesis research leading to the writing of an SB thesis, to be arranged by the student and an appropriate MIT faculty member. Intended for seniors. 12 units recommended. Architecture Staff

4URG Undergraduate Research in Design
Prereq: None
U (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

Research and project activities, which cover the range represented by the various research interests and projects in the Department. L. Sass

4URG Undergraduate Research in Design
Prereq: Permission of instructor
U (Fall, IAP, Spring, Summer)
Units arranged
Can be repeated for credit.

Research and project activities, which cover the range represented by the various research interests and projects in the department. Students who wish a letter grade option for their work must register for 4.URG. L. Sass