

DESIGN AND VISUALIZATION

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This study area encompasses required studios, elective advanced studios, and courses that concentrate on design logic and skills that support design thinking and representation.

For the M.Arch. I program, required courses in this study area include a core sequence of four design studios, two advanced studios, and two visualization elective courses; one of these visualization electives must be completed in the fall term of the first year. The core studio sequence begins with spatially abstract exercises and progressively engages and integrates scales, sites, and concerns of increasing complexity that integrate material, tectonic, contextual, ecological, and urban demands. Architectural Foundations (ARCH 1000) is a summer course required for entering students who have not had significant prior architectural training. A further visualization course (ARCH 1019) – in the early summer of the first year – focuses on computational tools and is required of all M.Arch. I students.

For the M.Arch. II program, required courses in this study area include two advanced studios and the design research studios (ARCH 1121 *a* and *b*), completed in the final two terms of study.

REQUIRED COURSES

[ARCH 1000, Architectural Foundations]

(Required of incoming M.Arch. I students with little or no academic background in architecture.) This summer course is an intensive, five-week immersion into the language of architectural representation and visualization, offering a shared inventory and basic framework upon which to build subsequent studies. Students are introduced to techniques and conventions for describing the space and substance of buildings and urban environments, including orthographic drawing, axonometric projection, perspective, architectural diagramming, vignette sketching, and physical modeling. Students work in freehand, hard-line, and digital formats. In parallel to the visualization portion of this course, an introduction to architectural history and theory focuses on principal turning points of thought and practice through to the eighteenth century. o Course cr

[ARCH 1002, Fundamentals of Modeling and Fabrication]

o Course cr

ARCH 1011a, Architectural Design 1 Cara Liberatore, Can Bui, Michael Szivos, Nicholas McDermott, Violette de la Selle, and Maria Rius Ruiz

This studio is the first of four core design studios where beginning students bring to the School a wide range of experience and background. Exercises introduce the complexity of architectural design by engaging problems that are limited in scale but not in the issues they provoke. Experiential, social, and material concerns are introduced together with formal and conceptual issues. 9 Course cr

[ARCH 1012, Architectural Design 2]

(Required of first-year M.Arch. I students.) This second core studio continues to extend spatial exploration into the conception and design of a building through studies of scale, site, program, and materiality. The term is organized by a series of projects that culminate with the design of a building that engages both public and private space. Prerequisite: ARCH 1011. 9 Course cr

[ARCH 1019, Visualization and Computation]

(Required of first-year M.Arch. I students, early summer. No waivers allowed.) This seven-week intensive course covers the fundamentals and implications of four specific sets of digital software and skills: building information modeling (BIM); virtual realities; image making; and scripting and algorithmic design. Each section is taught by a different instructor who brings specific experience to both tutorials and discussions on the broader impact of computation on the field. 1½ Course cr

ARCH 1021a, Architectural Design 3 Sharon Betts, Martin Cox, Karolina Czczek, Peter de Bretteville, Aniket Shahane, and Abigail Chang

(Required of second-year M.Arch. I students.) This third core studio concentrates on a medium-scale public building, focusing on the integration of composition, site, program, mass, and form in relation to structure, and methods of construction. Interior spaces are studied in detail. Large-scale models and drawings are developed to explore design issues. Prerequisite: ARCH 1012. 9 Course cr

[ARCH 1022, Architectural Design 4]

(Required of second-year M.Arch. I students.) This fourth and final M.Arch I core studio expands on the fundamental architectural skills introduced in the previous three terms to examine the role of architecture and the architect at the scale of the city. Extending beyond the bounds of a building, this course examines a variety of forces – architectural, urban, social, economic, ecological, political, and other – that shape and order our built environment, emphasizing and cultivating a range of architectural themes and skills. Prerequisite: ARCH 1021. 9 Course cr

[ARCH 1062, Resources for Design Research]

This course is intended to introduce students to the academic, digital, and fabrication resources at the School and University. Through a handful of exercises, the course provides an in-depth orientation to the Yale University Library system, the latest software and digital solutions employed at the School, and the rich fabrication facilities available to students. Teaching fellows lead workshops and orientation sessions, as well as assist the various instructors throughout the three-week period. 0 Course cr

[ARCH 1121, Independent Design Research Studio II]

(Required of and limited to second-year M.Arch. II students.) This course is the culmination of the post-professional curriculum and allows students the opportunity to build on individual and group work around contemporary issues by proposing a final design thesis project. 9 Course cr

ADVANCED DESIGN STUDIOS (FALL)

Advanced studios are limited in enrollment. Selection for studios is determined by lottery.

ARCH 1101a, Advanced Design Studio 9 credits. Alan Organschi

ARCH 1102a, Advanced Design Studio 9 credits. Alan Plattus

ARCH 1103a, Advanced Design Studio 9 credits. Carlos Zedillo, Alberto Kalach, and Andrei Harwell

ARCH 1104a, Advanced Design Studio 9 credits. Kim Holden and Emily Abruzzo

ARCH 1105a, Advanced Design Studio 9 credits. Dan Wood

ARCH 1106a, Advanced Design Studio 9 credits. Marina Tabassum

ARCH 1107a, Advanced Design Studio 9 credits. Sandra Barclay and Jean Pierre Crousse

ARCH 1108a, Advanced Design Studio 9 credits. Billie Tsien

ARCH 1109a, Advanced Design Studio 9 credits. Chat Travieso

ARCH 1110a, Advanced Design Studio 9 credits. Mark Foster Gage

ADVANCED DESIGN STUDIOS (SPRING)

Advanced studios are limited in enrollment. Selection for studios is determined by lottery.

ARCH 1111b, Advanced Design Studio 9 credits. Isaac Kalisvaart and Bjarne Mastenbroek

ARCH 1112b, Advanced Design Studio 9 credits. Adib Cúre and Carie Penabad

ARCH 1113b, Advanced Design Studio 9 credits. Sara Caples and Everardo Jefferson

ARCH 1114b, Advanced Design Studio 9 credits. Vo Trong Nghia

ARCH 1115b, Advanced Design Studio 9 credits. Tatiana Bilbao

ARCH 1116b, Advanced Design Studio 9 credits. Alan Ricks

ARCH 1117b, Advanced Design Studio 9 credits. Nader Tehrani and Ghazal Abbasy

ARCH 1118b, Advanced Design Studio 9 credits. George Knight

ELECTIVE COURSES

ARCH 1211a, Drawing and Architectural Form Victor Agran

With the emergence of increasingly sophisticated digital technologies, the practice of architecture is undergoing the most comprehensive transformation in centuries. Drawing, historically the primary means of generation, presentation, and interrogation of design ideas, is currently ill-defined and under stress. This course examines the historical and theoretical development of descriptive geometry and perspective through the practice of rigorous constructed architectural drawings. The methods and concepts studied serve as a foundation for the development of drawings that consider the relationship between a drawing's production and its conceptual objectives. Weekly readings, discussions, and drawing exercises investigate the work of key figures in the development of orthographic and three-dimensional projection. Ultimately, the goal is to engage in a focused dialogue about the practice of drawing and different methods of spatial inquiry. Limited enrollment. 3 Course cr

[ARCH 1224, The Chair]

The chair has been a crucible for architectural ideas and their design throughout the trajectory of modern architecture. The chair is both a model for understanding architecture and a laboratory for the concise expression of idea, material, fabrication, and form. As individual as its authors, the chair provides a medium that is a controllable minimum structure, ripe for material and conceptual experiments. In this seminar, students develop their design and fabrication skills through exploration of the conceptual, aesthetic, and structural issues involved in the design and construction of a full-scale prototype chair. Limited enrollment. 3 Course cr

[ARCH 1228, Ruins, Ruination and Reuse]

Architectural ruins index the total failure of individual buildings, technologies, economies, or, at times, entire civilizations. This course researches the topics of ruination and architectural ruins—what produces them, what defines them, and how they impact individuals, cities, and civilizations on levels from the visual and formal to the philosophical and psychological. The formal and visual materials of this course emerge from the study of ruins from not only the past and present, but also the future, through research into the speculative territories of online “ruin porn,” new genres of art practice, and in particular dystopian television and film projects that reveal an intense contemporary cultural interest in apocalyptic themes. While significant nineteenth-century theories of architectural ruination, including those of John Ruskin (anti-restoration) and Eugène Emmanuel Viollet-le-Duc (pro-restoration), are addressed, the primary intellectual position of the course emerges from readings and discussions of the philosophical methodology of “ruination.” Student projects involve the philosophical and aesthetic ruination of iconic architectural projects to determine not only their essential qualities, but hidden, latent ones as well. Subsequent group discussion of this work vacillates between philosophical and aesthetic poles in an attempt to tease out new observations on these projects as well as on the nature of ruins and ruination. The self-designed final project is determined pending consultation between the students and instructor, but involves photorealistic failure of past, present, or future architectural or urban projects; dystopic visual speculations; fabrication experiments that test actual material decay and failure; or attempts to reproduce the aesthetic ambitions of ruin porn through the manipulation of existing, or the design of new, projects. The goal of the course is not to convey an existing body of architectural knowledge, but to unearth a new architectural discourse that considers architecture in reverse—emphasizing its decay rather than its creation in an effort to reveal new territories of architectural agency. Limited enrollment. 3 Course cr

[ARCH 1243, Graphic Inquiry]

This seminar explores how architects might use a wider array of communication processes—from text to image, from moving image to network and beyond—to describe, develop, and release their ideas strategically. The inquiry includes, but goes beyond, graphic tools to explore alternate models of knowledge creation; it is akin to research but is more open-ended in terms of its methodologies and possible outcomes. Architecture in this sense is seen in the context of a wide variety of other subjects. This seminar is structured in three parts, each one looking at a different communication medium and its effects: moving image, printed pamphlet, and a single surface/function web graphic. Each of these media implies different ideas of duration, attention, audience, and distribution and is explored through a series of activities:

illustrated talks, readings, precedent studies, and three projects developed by each student. 3 Course cr

ARCH 1248a, Cartographies of Climate Change Joyce Hsiang

Climate change disproportionately affects the people and places with the least power and resources. As our sea levels have risen, so too has the extreme socioeconomic disparity of specific communities and countries, creating a drowning class of climate refugees. Entire countries on the front lines of sea-level rise face the specter of nationhood without territory, despite the undeniable fact that their contribution to this global problem is negligible. And if climate change is in fact “the result of human activity since the mid-20th century,” it is in actuality a largely male-made phenomenon, if we unpack the gender dynamics and underlying power structures of the proto-G8 nations, the self-proclaimed leaders of industrialization. These power dynamics become even further exacerbated as we consider the implications of the particularly American interest in doubling down on investing in the heaviest piece of infrastructure ever — climate engineering. The architectural community appears to be in agreement. Climate change is a fundamental design problem. And yet calls to action have been ineffectual, responses underwhelming in the face of this overwhelming challenge. As the architectural community is eagerly poised to jump on the design bandwagon, this course seeks to reveal, foreground, empower, and give physical form to the spatial dimensions and power dynamics of the people and places most impacted by climate change. More broadly, the course aspires to help students develop their own critical stance on climate change and the role architects play. 3 Course cr

ARCH 1249a, Virtual Futures Jason Kim

This course is an investigation of the ways technology, which now mediates data through spatial computing platforms such as extended reality (XR), will continue to impact our relationship with the built environment and the architect’s role in the development of these new digital horizons. Our exploration in XR includes a special guest instructor, Olalekan Jeyifous, a visual artist whose work explores visions of the future as a critique of contemporary social structures through the creation of dystopian realities describing urban issues, politics, art, and popular culture as expressions of the black diaspora within the disappearing urban ephemera of places like Brooklyn, New York, where his practice is based. Together, we explore the existing urban condition as an environment co-constitutive of other realities such as social structures, institutionalized injustice, and prevailing false narratives expressed as imagined futures in the form of non-static immersive experiences of the city. These imagined futures reveal the thin line between hope and despair as expressions of uncomfortable truths about the current trajectories of society. 3 Course cr

ARCH 1250a, The Plan Brennan Buck

The architectural plan is an index of architectural values — of how buildings configure people in relation to each other. Historically, the plan was the means through which architects deployed principles of proportion, composition, uniformity, montage, and figuration. It expresses the underlying ethics and ideologies of the architecture; evidences the background environment of building technologies, rules, regulations, conventions, and customs; and traces the power relations that buildings enact. The recent return of the plan as a topic of discourse and focus of architectural energy suggests renewed interest in the correlation of form and politics that the plan describes. This course sketches the history of plan making in the west during the nineteenth

and twentieth centuries, from Beaux Arts composition to modern “non-composition,” before focusing on the scattershot discourse about the plan today. Rather than positing a single grand thesis about the contemporary plan, the course foregrounds the countless threads of plan making evident today and asks students to identify the underlying ideas, histories, and implications of specific plans. 3 Course cr

ARCH 1253a, Small Objects Timothy Newton

This course will be offered to graduate and undergraduate students who wish to pursue their own special talents, follow their passions, and expand possibilities and creative impulses to create a small object of their own design. The course is cross-listed with Architecture, Neuroscience, and Engineering & Applied Science (SEAS) and will intentionally bring together students with different backgrounds and experiences. The course explores the ideation, design processes, and fabrication of a functioning prototype. A “small object” is defined as something that is able to fit comfortably through a standard doorway. Potential areas of exploration include, but are not limited to: jewelry, furniture, experimental scientific instruments, electronic devices, architectural objects, lighting, cutlery, packaging, and musical instruments. Student selection is competitive and through application only. Proposal submissions are due by Aug. 18 (mid-night), with preference given to graduate students in Architecture, Neuroscience, and SEAS. Previous experience building your small object is not required. Passion for your object—and for building it—are critical for a successful proposal and for success in the course. (Example proposals will be provided with course description material.) Each student will be able to follow their own path as they acquire professional-level competencies in designing and creating their small object, with an understanding that design disciplines are increasingly expanding and converging. As such, students will be encouraged to explore as many university resources as possible to achieve the desired outcome. The methodology used to complete tasks in this course will give students an understanding of a typical industrial design process while equipping them with skills, concepts, and tools used to create scientific-grade instrumentation. The course will encourage creative and scientific exploration, while fostering an interdisciplinary nexus for fabrication technology, design pedagogy, and problem-solving. While each student will pursue an individual project, true innovation often results from cross-pollination between disciplines. To facilitate interdisciplinary interaction and expand possibility, students from different disciplines will work together as they explore the development and fabrication of their small object. Weekly reviews will be coupled with training and seminars. Students will also have access to multiple state-of-the-art design and fabrication facilities that include manual and computer-controlled manufacturing machines, electronic equipment, rapid prototyping tools, and computer aided drafting (CAD) and rendering programs. Students will be exposed to design drawing techniques, physical modeling methods, and the concept of designing for manufacture. Students will acquire professional-level competence in two- and three-dimensional design—using aesthetic sensibility, digital/analog tools, and critical thinking—combined with a working knowledge of materials and methods in an environmentally responsible context. The course will be structured around teaching modules, studio time, and critique periods. During class sessions, students will be encouraged to actively engage in critiquing their fellow students’ work. Technique workshops covering different project-related types of fabrication will be held during

the second half of the semester. Enrollment is limited to no more than 9 students.

3 Course cr

ARCH 1254a, Ink Michelle Fornabai

Course Introduction Ink proposes a creative and critical inquiry into ink's instrumentality in architecture to delineate a subtle story—a latent history of architecture in ink—placing ink in our world with the purpose of gaining knowledge within and for the architectural discipline. A close consideration of the varied conceptual and material aspects of ink acts as a medium to reflect upon the means by which architectural knowledge is generated, articulated, and applied. Course Structure The course will be structured by the abecedary, ink or “V is for Vermilion as described by Vitruvius” An A to Z of Ink in Architecture. Composed from various material forms of ink found in studio, an alphabet in 26 images was created and sent as an invitation to 26+ architects, artists, historians, theorists, scholars, inventors and poets to write a brief entry on a discrete ink object. On the first day of class, 13 of the 26 letters will be selected at random and a single letter assigned to each week of the course. Each week, the class will closely examine the ink objects described by diverse voices in the entries written under the assigned letter— conceptually and materially— by reading, in discussion and in drawings. Reading: Each entry describing a discrete ink object is typically brief—generally 500 to 1000 words; the 26 letters contain between 1-5 entries each on average. Weekly reading will be assigned by letter to be discussed in class. Discussion: Each week the class will discuss the ink entries under a single letter to create collective word images. Drawing (in-class/in-studio): Students will spend time each class period using drawing to explore material and conceptual aspects of the ink objects. [These drawings may provide material for the weekly out-of-class assignments. Students will keep a folio of A3 loose-leaf sheets that can be pinned up and compiled for reference and review. In addition, there may be collective in-class drawings, done on larger paper that will be in response to discussion in class. They will be due at the end of the class period. Supplemental ink materials may be provided by the instructor.] Drawing (out-of-class assignments): Students will construct an architectural drawing(s) each week for the letter discussed in class, due at the beginning of the next class (for pin-up/discussion). [Students will determine four parameters for each architectural drawing: scale (ie. measured drawing), view (ie. projection: parallel, oblique, orthographic, isometric, perspective), set (format), and sequence. These architectural drawings may be manual and/or digital. The Beinecke Rare Book and Manuscripts Library, a container formed of ink that contains ink, will form the basis of these drawings.] Pin-ups: Weekly drawing assignments will be reviewed weekly. Before each week's discussion, you should pin-up with the rest of your studio group to facilitate an efficient discussion. Reviews: For Mid review, architectural drawing of a single entry from ink by the student's choice (not covered in the 13 assigned letters) will be constructed. For Final review, students may delineate a new entry for the abecedary, ink. Mid and Final reviews will include outside critics. Evaluation: Each drawing assignment will be evaluated for a) technique and b) completion. After each pin-up and during the in-class exercise the professor will give an evaluation that will then be recorded by the TF. If a drawing needs improvement to satisfactorily meet the requirements of the assignment, the student will be asked to make these improvements for re-evaluation. All assignments must meet this standard to successfully pass the course. Course Requirements Attendance at all class sessions is mandatory, in accordance with YSoA policy. More than two unexcused absences

constitute failure of the class. Out-of-class drawing assignments must be completed by 6pm on the Thursday before the date they are reviewed. Drawings are to be saved for comprehensive review at the end of the term and submitted digitally as directed by the Teaching Fellow. 3 Course cr

[ARCH 1256, The Black Box: Architecture in an Age of Opacity]

3 Course cr

ARCH 1259a, Geometric Translations Sunil Bald

3 Course cr

ARCH 1289a, Space-Time-Form Eeva-Liisa Pelkonen

This seminar explores key concepts, techniques, and media that have affected the design, discussion, and representation of architecture in the twentieth century. The seminar aims to develop a particular type of disciplinary knowledge by crossing experience and act with historical and theoretical engagement. The class foregrounds reciprocity of practice and context, believing the exchange provides an invaluable tool for understanding the origin of ideas and thereby capitalizing on their full potential. Each class is organized around a single concept (form, structure, space, time); technique (drawing, material, color); or media (typography, photography, weaving). Sessions require both a visual/material exercise and close reading of seminal texts. Particular attention is paid to working with different tools and techniques, registering, observing, and analyzing formal and material techniques and effects. Limited enrollment. 3 Course cr

[ARCH 1291, Continuity and Change: Rome]

(Open only to M.Arch. I second-year and M.Arch. II first-year students. Enrollment subject to the permission of the instructors and satisfactory completion of all required preparatory course work.) This intensive five-week summer workshop takes place in Rome and is designed to provide a broad overview of that city's major architectural sites, topography, and systems of urban organization. Examples from antiquity to the present day are studied as part of the context of an ever-changing city with its sequence of layered accretions. The seminar examines historical continuity and change as well as the ways in which and the reasons why some elements and approaches were maintained over time and others abandoned. Hand drawing is used as a primary tool of discovery during explorations of buildings, landscapes, and gardens, both within and outside the city. Students devote the final week to an intensive independent analysis of a building or place. M.Arch. I students are eligible to enroll in this course after completing at least three terms. This course does not fulfill either the History and Theory or the Urbanism and Landscape elective requirements. All program travel plans will be made in accordance with University and national travel policies. Limited enrollment. 3 Course cr

ARCH 1299a, Independent Course Work Joyce Hsiang

Program to be determined with a faculty adviser of the student's choice and submitted, with the endorsement of the study area coordinator, to the Rules Committee for confirmation of the student's eligibility under the rules. (See the School's Academic Rules and Regulations.) 3 Course cr

Electives outside of School of Architecture

Courses offered elsewhere in the university may be taken for credit with permission of the instructor. Unless otherwise indicated, at the School of Architecture full-term courses are typically assigned 3 credits; half-term courses are assigned 1.5 credits. Students must have the permission of the design and visualization study area coordinators in order for a course to count as a visualization elective.