DESIGN AND VISUALIZATION

Brennan Buck and Mark Foster Gage, Study Area Coordinators

This study area encompasses required studios, elective advanced studios, and courses that concentrate on design logic and skills and 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 progresses from spatially abstract exercises to more complex programs that require integrative thinking at various scales and situated on sites of increased complexity, while integrating ecological, landscape, and tectonic demands. The first course (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 — is required of all M.Arch. I students.

For the M.Arch. II program, required courses in this study area include three advanced studios and a design research studio (ARCH 1121).

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. 0 Course cr

ARCH 1011a, Architectural Design 1  Brennan Buck, Michael Szivos, Nicholas McDermott, and Violette de la Selle
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. 3 Course cr

ARCH 1021a, Architectural Design 3 Emily Abruzzo, Rachely Rotem, Peter de Bretteville, and Mark Gage
(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 1121, Design Research Studio ]
(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 Plattus
ARCH 1102a, Advanced Design Studio 9 credits. Peter Eisenman and Frank Gehry
ARCH 1103a, Advanced Design Studio 9 credits. Marc de la Bruyère, Bass Distinguished Visiting Architecture Fellow; and Claire Weisz
ARCH 1104a, Advanced Design Studio 9 credits. Brigitte Shim, Foster Visiting Professor
ARCH 1105a, Advanced Design Studio 9 credits. Xu Tiantian, Davenport Visiting Professor
ARCH 1106a, Advanced Design Studio 9 credits. Patrick Bellew and Andy Bow, Bishop Visiting Professors
ARCH 1107a, Advanced Design Studio 9 credits. Billie Tsien and Tod Williams, Gwathmey Professors in Practice

ARCH 1108a, Advanced Design Studio 9 credits. Francis Kéré, Kahn Visiting Professor; and Martin J. Finio

ARCH 1109a, Advanced Design Studio 9 credits. Rachaporn Choochuey, Kahn Visiting Assistant Professor

ARCH 1110a, Advanced Design Studio 9 credits. Sunil Bald

ARCH 1111a, Advanced Design Studio 9 credits. Billy Fleming, Balmori Visiting Professor

ARCH 1111b, Advanced Design Studio 9 credits. Stella Betts

ARCH 1112b, Advanced Design Studio 9 credits. Tatiana Bilbao, Bishop Visiting Professor

ARCH 1113b, Advanced Design Studio 9 credits. Zhu Pei, Davenport Visiting Professor

ARCH 1114b, Advanced Design Studio 9 credits. Neil Thomas and Ray Winkler, Gwathmey Professors in Practice

ARCH 1115b, Advanced Design Studio 9 credits. Momoyo Kaijima, Foster Visiting Professor

ARCH 1116b, Advanced Design Studio 9 credits. Peter McKeith, Kahn Visiting Professor

ARCH 1117b, Advanced Design Studio 9 credits. Thomas Kelley and Carrie Norman, Kahn Visiting Assistant Professors

ARCH 1118b, Advanced Design Studio 9 credits. Mabel Wilson, Saarinen Visiting Professor

ARCH 1119b, Advanced Design Studio 9 credits. Ann Beha, Stern Visiting Professor

ARCH 1121b, Design Research Studio 9 credits. Bimal Mendis and Emily Abruzzo

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 1213, Books and Architecture ]
For architects, the book has been a necessary (if not essential) tool for clarifying, extending, and promoting their ideas and projects. This seminar examines the phenomenon of the book in architecture as both an array of organizational techniques (what it is) and as a mediator (what it does). Arguably, outside of the artifice and material fact of the building itself, the book has been the preferred mode of discourse that architects have chosen to express their intellectual project. This seminar is part lecture, part workshop where the experience of making a series of books helps to inform the development of ideas about the projective capacity of the book. Through case studies, this seminar examines the relationship book production has with a selection of contemporary and historical practices, including each project’s physical and conceptual composition as well as how each project acts as an agent of the architect within a larger world of communication. The second part of the seminar asks students to apply ideas in a series of three book projects that emphasize the book as an instrument of architectural thinking. Most projects are individual efforts, but work in pairs or groups is also explored. Limited enrollment.  3 Course cr

[ ARCH 1217, Architectural Product Design ]
This course attempts to broaden the design experience by concentrating on the design and innovation of three-dimensional architectural objects not usually found in architectural building commissions. Students are required to design and fabricate full-size, working prototypes of four small objects, such as weather vanes, andirons, step stools, mailboxes, birdhouses, etc. Emphasis is on wood and metal, but all materials are considered. Issues of detail, scale, proportion, aesthetics, manufacturing, and commercial viability are explored. Limited enrollment.  3 Course cr

[ ARCH 1219, Designing Social Equality ]
Through the act of design, students explore ideas from contemporary thought leaders including Michelle Alexander, Ibram Kendi, Jacques Rancière, Robin DiAngelo, Steven Shaviro, Angela Davis, Justin Jennings, Stacey Abrams, the Laboria Cuboniks Xenofeminist Collective, and others. Concepts and movements addressed include, but are not limited to, the tangible, physical, and designed aspects of equality philosophy, environmental justice, colonialization, anti-racism and white privilege, the geographies of voter suppression, mass incarceration, immigrant detention, virtue signaling, the contemporary status of hagiography through monuments and canon, and the relationship between protest and form. This seminar can also fulfill the History and Theory elective requirement through the optional writing of a fifteen-page paper done in association with, or possibly instead of, the final project, pending approval of the instructor. Limited enrollment.  3 Course cr

ARCH 1223a, Formal Analysis I  Peter Eisenman
The goal of this course is to learn to see and read as an architect through a weekly series of texts and comparative analyses that move from the theocentric late-medieval, to the humanism and anthropocentricity of the early Renaissance, to the beginning of the Enlightenment of the late eighteenth century. This survey is not intended historically but as an introduction to the seeing and reading of architecture through time. An
architect must learn to see beyond the facts of perception and must see as an expert, different from the average user. This expertise implies being able to see, as a form of close reading, that which is not present—the unseen. We look at architects who have animated discourse—from Brunelleschi to Piranesi—providing an example of disciplinary change over time. 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 1225, Formal Analysis II ]
This course examines two questions: what was the modern and what was the postmodern? Through a series of weekly texts and comparative analyses, the nature of that difference, for instance universalizing or contradicting, is explored with the intention of reconsidering the modern in a contemporary context. The course is divided into two halves, one concerned with modernism from 1914 to 1939 and the second with postmodernism from 1968 to 1988. Considering architects from Le Corbusier to Robert Venturi, the class pursues the skill of close reading, which moves from the idealism of the modern to the criticality of the postmodern. ARCH 1223, Formal Analysis I, is not a prerequisite. Limited enrollment. 3 Course cr

[ ARCH 1227, Drawing Projects ]
Each student admitted to the course comes prepared with a particular subject that is investigated through the media of drawing for the entire term. There is a weekly evening pin-up with group discussion of the work in progress. 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
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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 1233, Composition and Form ]
This seminar addresses issues of architectural composition and form in four three-week exercises titled Form, Structure, Section, and Elevation. Leaving aside demands of program and site in order to concentrate on formal relationships and the impact of alternative strategies, these exercises are intended to develop techniques by which words, briefs, written descriptions, intentions, and requirements can be translated into three dimensions. Each subject is introduced by a one-hour lecture on organizational paradigms in works of architecture from many periods and a variety of cultures. The medium is both physical and 3-D digital models. Multiple iterations emerging from the first-week sketches and finalized in the following week are the basis for the generation of multiple, radically differing strategies, each to be analyzed and understood for its own unique possibilities and consequences. Limited enrollment. 3 Course cr

[ ARCH 1239, Theory through Objects ]
This seminar seeks to address the increasing expectation that architecture more directly address the social and political problems of today: income inequality, racial division, religious persecution, gender identity and rights, and ecological crisis, to name a few. Students speculate on ways in which the design of buildings and objects can be more socially and politically impactful and if there are other ways to discuss these issues rather than relying on standard critical-theory tropes that have governed architecture’s social ambitions for decades. Instead of relying on dry PowerPoint presentations or abstract, intangible discussions, in this seminar all presentations, brainstorming, ideation, and think-tank-style discussions are done exclusively by engaging with physical objects. Students conduct preliminary research on historic examples of the politicization of objects, largely using the Victoria and Albert Museum’s Disobedient Objects exhibition (2014–15) as a collective starting point, to position subsequent discussions related to selected writings by Jacques Rancière, Graham Harman, Elaine Scarry, Steven Shaviro, the Laboria Cuboniks Xenofeminist Collective, and others. Concepts and movements addressed include, but are not limited to, Dissensus/Aisthesis, Xenofeminism, Object-Oriented Ontology, Accelerationism, and Afrofuturism. All assignments involve the production of physical objects with the exception of students who opt to fulfill the History and Theory elective requirement through the writing of a fifteen-page paper instead of the production of a final object. Limited enrollment. 3 Course cr

[ ARCH 1241, Rendered: Art, Architecture, and Contemporary Image Culture ]
This course addresses the role of digital production and image making in art and architecture at a time when consumers of culture, including architects, are inundated by digital images. Contemporary image culture has profound effects on how we
understand authorship, materiality, and representation. The course examines the impact of the Internet on contemporary art and recent writing on aesthetic concepts, including post-digital, post-medium, and the new aesthetic. Students are asked to speculate on the current and future role of the image as an architectural medium in this context. The final project is a hybrid image-object situated in both a physical and an online context. 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 1245, Color in Architecture ]
This seminar has several objectives. One is to offer each student greater mastery over the creation/selection/juxtaposition of color, allowing the creator to experiment more knowingly and intentionally. One is to examine a broad range of examples of color in architecture, cutting across time and across cultural histories, to examine its sensory and cultural impacts. Students are required to explore color through readings in color theory, through a series of paint and paper exercises, and through selection of an existing example of color in architecture for class presentation and as a written paper.  3 Course cr

[ ARCH 1246, AI Aesthetics ]
This course assesses the impact of artificial intelligence on design and architecture as an aesthetic rather than a purely economic question. AI has already added a series of invisible layers to how we see and create our environment. Understanding this new machine-mediated visual culture is critical to addressing its growth, finding potentials and opportunities, and identifying avenues for critique and resistance. Readings and discussion trace the historical role of algorithms in human culture and the understanding of design as an algorithmic process, even a machinic one. During the second half of the course, students work with AI platforms such as Runway ML to develop a design proposal that takes a critical and aesthetically specific stance on the current and impending impact of AI.  3 Course cr

[ ARCH 1247, Animal Houses ]
The course studies the nature of animal occupation on Earth, then focuses on a method or system of occupation by a single species. Species selection and methods of representation are governed by individual interests based on an introductory series of exercises focused on the primary categories of land, sea, and air. Work is realized in the form of visualizations that collect and re-present discoveries. Given the nature of the research, visualizations push the boundaries of traditional and
contemporary architectural drawings and imagery by incorporating process, time, and material reconstitution into the presentation of spatial language. The seminar allows for in-depth individual research and practice in the transformation of information. Understanding the material nature of occupied space, the research further allows for an expanded understanding of alternate building practice and methodologies. 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 though 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 1251, Geometric Translations ]
This course investigates drawing as a generative instrument of formal, spatial, and tectonic discovery. Principles of two- and three-dimensional geometry are studied through a series of exercises that foreground seeing, thinking, and translation. In short, students “draw from drawing,” working fluidly between manual drawing, computer drawing, and material construction to investigate a range of interrelated topics including tiling, lattices, compound surfaces, orthographic translation, symmetry operations, and stereotomy. All exercises are designed to enhance the ability to conceptualize and visualize architectural form and space, understand its structural foundations, and provide tools that reinforce and inform the design process. Fulfills first-term M.Arch. I Visualization requirement. 3 Course cr

[ ARCH 1289, Space-Time-Form ]
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 1299, Independent Course Work ]
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.