College of Architecture

Sam Fox School of Design & Visual Arts

The Sam Fox School of Design & Visual Arts (http://samfoxschool.wustl.edu) is a unique collaboration in architecture, art, and design education, linking professional studio programs with one of the country's finest university art museums in the context of an internationally recognized research university.

The Sam Fox School is composed of the College of Architecture, the Graduate School of Architecture & Urban Design, the College of Art, the Graduate School of Art, and the Mildred Lane Kemper Art Museum (http://www.kemperartmuseum.wustl.edu/).

Architecture

Throughout history, architects have played a leading role in forming the environment and in interpreting the aspirations of societies in all parts of the world. As a practical and useful art, architecture embraces aesthetic, ethical, social and technical responsibilities. Architecture responds to the way people live and, in turn, influences their lives.

Students considering an architectural education and architecture as a potential career express an excitement about design and building as well as a commitment to the environment. If students plan to study architecture, they should have artistic ability and a good academic base. Personal interests in such areas as drawing, painting, photography, sculpture, building and the environment suggest a possible aptitude for architecture.

Architecture reflects culture; architects must know their culture deeply. To gain an understanding of all aspects of architecture and to develop the attitudes and skills necessary to deal with them, students must have a broad liberal arts education. This base of cultural understanding and critical thinking is combined with a curriculum that focuses intensely on the study of architecture.

Architecture is an absorbing, fascinating profession. Choosing architecture as a professional career requires a major educational commitment at the undergraduate level as well as further study in a professional degree program. With a professional degree in architecture, a graduate may choose to work in small or large architectural firms, in academia, in community or governmental organizations, with development teams, and in a variety of related fields.

Architecture at Washington University

Washington University established the Department of Architecture as part of the School of Engineering and Architecture in 1902. The School of Architecture became an independent division of the university in 1910. In 2005, as part of the formation of the Sam Fox School of Design & Visual Arts, the School of Architecture was reorganized as the College of Architecture and the Graduate School of Architecture & Urban Design.

In 1932, Givens Hall was constructed to house the school as a result of a generous gift in memory of Joseph W. and Kate Abbey Givens.

In 1967, the School of Architecture became one of the first schools in the United States to offer a pioneering six-year joint-degree program (Bachelor of Arts and Master of Architecture).

Our four-year undergraduate degree programs emphasize the development of both making and digital skills, which help students to become more creative thinkers and designers. All architecture students take similar courses during their first three years; courses taken during the fourth year will differ depending on each student's choice of program.

The **Bachelor of Science in Architecture** entails a more intensive study of architecture during the senior year. Students will take a senior-level design studio focused on advanced building design along with structures courses, architectural history/theory courses that emphasize urban design issues, and technology courses in environmental systems or landscape architecture.

The **Bachelor of Arts in Architecture** offers greater flexibility. Its strong, adaptable undergraduate curriculum prepares students for graduate study in architecture, usually for three years. During their senior year, students may choose to take additional architecture design studios, or they may pursue courses in other areas of interest.

These undergraduate degree programs offer students the opportunity to gradually focus their undergraduate studies within the college and allow them to make an incremental commitment to a career in architecture. Both programs prepare students to move on to a master's degree, putting them on track for teaching and leadership positions in architecture and other related fields.

The College of Architecture faculty are nationally and internationally renowned practitioners and researchers who are committed to students' undergraduate experience. As academic advisors, they work with the director and the undergraduate chair to help students build an individualized curriculum, select specific courses, and chart plans for their future careers.

Phone:	314-935-6200
Email:	samfoxschool@wustl.edu
Website:	http://samfoxschool.wustl.edu

Faculty

Endowed Professors

Bruce Lindsey, AIA (https://samfoxschool.wustl.edu/people/faculty/164-bruce-lindsey/)
E. Desmond Lee Professor for Community Collaboration
MFA, University of Utah
MArch, Harvard University

Robert McCarter (https://samfoxschool.wustl.edu/people/faculty/169-robert-mc-carter/)
Ruth & Norman Moore Professor
MArch, Columbia University

Eric Mumford (https://samfoxschool.wustl.edu/people/faculty/174-eric-mumford/)
Rebecca and John Voyles Professor of Architecture
PhD, Princeton University

Mónica Rivera (https://samfoxschool.wustl.edu/people/faculty/178-monica-rivera/)
JoAnne Stolaroff Cotsen Professor of Architecture
MArch, Harvard University

Professors

John Hoal (https://samfoxschool.wustl.edu/people/faculty/150-john-hoal/)
PhD, Washington University in St. Louis

Stephen P. Leet (https://samfoxschool.wustl.edu/people/faculty/162-stephen-leet/)
BArch, University of Kentucky

Adrian Luchini (https://samfoxschool.wustl.edu/people/faculty/167-adrian-luchini/)
MArch, Harvard University

Linda C. Samuels (https://samfoxschool.wustl.edu/people/faculty/179-linda-c-samuels/)
PhD, University of California, Los Angeles

Professor of Practice

Nanako Umemoto (https://samfoxschool.wustl.edu/people/faculty/186-nanako-umemoto/)
BArch, The Cooper Union

Associate Professors

Chandler Ahrens (https://samfoxschool.wustl.edu/people/faculty/137-chandler-ahrens/)
MArch, University of California, Los Angeles

Gia Daskalakis (https://samfoxschool.wustl.edu/people/faculty/146-gia-daskalakis/)
Dipl de Postgrado, Universidad Politecnica de Catalunia

Catalina Freixas (https://samfoxschool.wustl.edu/people/faculty/148-catalina-freixas/)
Dipl Arch, Universidad de Buenos Aires

Patricia Heyda (https://samfoxschool.wustl.edu/people/faculty/149-patty-heyda/)
MArch, Harvard University

Derek Hoeferlin (https://samfoxschool.wustl.edu/people/faculty/151-derek-hoeferlin/)
MArch, Tulane University

Zeuler Lima (https://samfoxschool.wustl.edu/people/faculty/163-zeuler-lima/)
PhD, Universidade de São Paulo

Constance Vale (https://samfoxschool.wustl.edu/people/faculty/187-constance-vale/)
MArch, Yale University

Hongxi Yin (https://samfoxschool.wustl.edu/people/faculty/191-hongxi-yin/)
PhD, Carnegie Mellon University

Assistant Professors

Wyly Brown (https://samfoxschool.wustl.edu/people/faculty/144-wyly-brown/)
MArch, Harvard University

Seth Denizen
PhD, University of California, Berkeley

Eric Ellingsen (https://samfoxschool.wustl.edu/people/faculty/147-eric-ellingsen/)
MArch, MLA, University of Pennsylvania
MA, St. John's College

Petra Kempf (https://samfoxschool.wustl.edu/people/faculty/156-petra-kempf/)
PhD, Karlsruhe Institute of Technology
MSc, Columbia University

Pablo Moyano (https://samfoxschool.wustl.edu/people/faculty/173-pablo-moyano/)
MArch, Washington University in St. Louis
MUD, Washington University in St. Louis

Zahra Safaverdi
MArch, Harvard University

Kelly Van Dyck Murphy (https://samfoxschool.wustl.edu/people/faculty/175-kelley-van-dyck-murphy/)
MArch, Washington University in St. Louis

Senior Lecturers

Ryan Abendroth (https://samfoxschool.wustl.edu/people/faculty/78-ryan-abendroth/)
MArch, University of Illinois at Urbana-Champaign

Michael Allen (https://samfoxschool.wustl.edu/people/faculty/138-michael-allen/)
BA, The Union Institute

Julie Bauer (https://samfoxschool.wustl.edu/people/faculty/140-julie-bauer/)
Diplom-Ingenieur in Architecture, Technical University of Berlin

Philip Holden (https://samfoxschool.wustl.edu/people/faculty/152-philip-holden/)
MArch, Washington University in St. Louis

George Johannes (https://samfoxschool.wustl.edu/people/faculty/154-george-johannes/)
MArch, Washington University in St. Louis

Don Koster (https://samfoxschool.wustl.edu/people/faculty/159-don-koster/)
MArch, Washington University in St. Louis

Doug Ladd
BA, Southern Illinois University, Carbondale

Gay Lorberbaum (https://samfoxschool.wustl.edu/people/faculty/166-gay-lorberbaum/)
MArch, Washington University in St. Louis

Emiliano López Matas (https://samfoxschool.wustl.edu/people/faculty/165-emiliano-lopez-matas/)
MArch, Washington University in St. Louis

Dennis McGrath (https://samfoxschool.wustl.edu/people/faculty/170-dennis-mc-grath/)
BArch, University of Kansas

Bob Moore (https://samfoxschool.wustl.edu/people/faculty/172-bob-moore/)
PhD, Washington University in St. Louis
BFA, Syracuse University

Jim Scott (https://samfoxschool.wustl.edu/people/faculty/180-jim-scott/)
JD, Saint Louis University School of Law

Phillip Shinn (https://samfoxschool.wustl.edu/people/faculty/181-phillip-shinn/)
BS, Princeton University

Jonathan Stitelman (https://samfoxschool.wustl.edu/people/faculty/184-jonathan-stitelman/)
MArch, Washington University in St. Louis
MUD, Washington University in St. Louis

Lindsey Stouffer (https://samfoxschool.wustl.edu/people/faculty/69-lindsey-stouffer/)
MFA, Washington University in St. Louis

Ian Trivers (https://samfoxschool.wustl.edu/people/faculty/185-ian-trivers/)
PhD, University of Michigan

Professors Emeriti

Kathryn Dean

Paul Donnelly

Iain A. Fraser

Gerald Gutenschwager

Robert Hansman

James Harris

Sheldon S. Helfman

Donald Royse

Carl Safe

Thomas L. Thomson

Deans Emeriti

Constantine E. Michaelides
FAIA

Cynthia Weese
FAIA

Majors

Architecture is interdisciplinary in nature, drawing from various bases of knowledge and requiring collaboration with other fields. Our program balances architectural education with a strong liberal arts base. Students can take classes in any field that interests them — art, engineering, computer science, psychology, literature, business, and more — allowing them to develop their abilities to think, communicate, and work across disciplinary lines.

We offer two degree tracks that allow students to individualize their educational experience. Students on both tracks may pursue minors, second majors, and dual degrees. While the BS in Architecture is an optimal springboard to graduate school, both tracks prepare students to move on to master's degrees, positioning them for teaching and leadership positions in architecture and other related fields.

The Major in Architecture

Bachelor of Arts in Architecture Degree

The **Bachelor of Arts in Architecture** is a more flexible course of study that allows students to take additional architecture design studios or to pursue courses in other areas of interest across the University.

For additional information about current requirements, please visit the Degree Requirements (http://bulletin.wustl.edu/undergrad/architecture/requirements/) page.

Bachelor of Science in Architecture Degree

The **Bachelor of Science in Architecture** offers a more intensive study of architecture during the senior year. Students will take upper-level design studios focused on advanced building design, along with structures courses, architectural history/theory courses that emphasize urban design issues, and technology courses in environmental systems or landscape architecture.

For additional information about current requirements, please visit the Degree Requirements (http://bulletin.wustl.edu/undergrad/architecture/requirements/) page.

Year-by-Year Plans for Both Degrees

All architecture students take similar courses during their first three years; courses during the fourth year will differ depending on the student's choice of degree track.

First Year

- Beginning design studios, with exploration of materials, media, and geometry
- Interdisciplinary drawing course
- Design of a small building
- Introduction to digital technology
- Additional course work in the liberal arts

Second Year

- Design studios focused on the relationship of architecture to the landscape and to the urban environment
- Interdisciplinary elective studies between art, architecture, and design
- Architectural history courses
- Additional course work in the liberal arts

Third Year

- Intensified design studios exploring building assemblies, structure, landscape, and sustainability
- Building systems course
- Architectural theory course
- Additional course work in the liberal arts

Fourth Year

For the Bachelor of Arts in Architecture

- Student-directed capstone project
- Ultimate flexibility to complete a second major or an additional minor or to explore other areas of interest
- Option to take additional architecture course work, including the student's choice of studios and theory classes

For the Bachelor of Science in Architecture

- Continue in-depth study of architecture through design studios
- Structures courses
- Architectural history and theory course work, with an emphasis on urban design issues
- Technology courses in environmental systems or landscape architecture

Minors

The College of Architecture offers several minors (https://samfoxschool.wustl.edu/academics/college-of-architecture/minors/), which are available to all students at Washington University in St. Louis. Minors require a total of 15 or 18 units from approved courses. All courses applied toward an architecture minor must be taken for a grade, and students must earn a grade of C- or higher. At least 12 of the credit units must be applied exclusively to the minor and cannot be double-counted toward another major or minor. No individual course may count more than once toward the minor.

Students should contact the designated minor advisor to declare a minor.

In the event that a required course is not offered during a given semester or a student has irreconcilable scheduling conflicts with required major courses or other minor courses, it is possible to substitute an appropriate alternate course with approval from the minor advisor.

The Minor in Architectural History and Theory

The minor in architectural history and theory (https://samfoxschool.wustl.edu/academics/college-of-architecture/minors/architectural-history-theory/) is open to all students at Washington University in St. Louis, regardless of major. It explores the broader cultural context of the discipline of architecture. Students learn about historical and contemporary issues in architecture around the world. Students pursuing the minor must take three architectural history survey courses; one methodology course; and two architectural history and theory electives (courses designated "CAST" and "RW" fulfill this requirement).

At least 12 of the 18 credit units must be applied exclusively to the minor and cannot be double-counted toward another major or minor.

Students interested in the minor should contact the minor advisor, Constance Vale (https://samfoxschool.wustl.edu/people/faculty/187-constance-vale/).

Units required: 18, including the following:

Required courses:

9 units of architectural history:

Code	Title	Units
ARCH 3280	Architectural History I: Antiquity to Baroque	3
ARCH 3284	Architectural History II: Architecture Since 1880	3
ARCH 4288	Architectural History III: Advanced Theory	3

3 units of methodology:

Code	Title	Units
ARCH 601	Theories & Methods of Historical Research	3
or		
Other methodology-based courses approved by the minor advisor		

Elective courses:

6 units of architectural history and theory electives: *

Code	Title	Units
Any 300-level or above architectural history and theory courses		6

* Courses designated "CAST" and "RW" fulfill this requirement.

The Minor in Architecture

The minor in architecture (https://samfoxschool.wustl.edu/academics/college-of-architecture/minors/architecture/) is open to students at Washington University in St. Louis who are not majoring in architecture. It introduces students to the fundamentals of architecture and develops an appreciation for buildings, cities and environments and their role in society. It includes a foundational design course such as ARCH 144 Architecture for Non-Architects, which provides an overview of the discipline by highlighting contemporary issues of architecture worldwide with a focus on introductory methods of design and representation. Students also complete one architectural history course, highlighting the importance of historical and cultural contexts. The remaining 9 units of course work are structured as open architecture electives, allowing students to explore their own interests more deeply. Elective options vary by semester, and the minor advisor can help determine courses that best meet the student's area of interest.

At least 12 of the 15 credit units must be applied exclusively to the minor and cannot be double-counted toward another major or minor.

Students interested in the minor should contact the minor advisor, Catalina Freixas (https://samfoxschool.wustl.edu/people/faculty/148-catalina-freixas/).

Units required: 15, including the following:

Required courses:

3 units of design chosen from the following: *

Code	Title	Units
ARCH 144	Architecture for Non-Architects	3
ARCH 111C	Introduction to Design Processes I	4.5
Architectural Apparitions: City of Collective Memory (Florence, Italy)		6

* If more than 3 units are taken, the extra units will be counted in the elective category.

3 units of architectural history chosen from the following: *

Code	Title	Units
ARCH 3280	Architectural History I: Antiquity to Baroque	3
ARCH 3284	Architectural History II: Architecture Since 1880	3
ARCH 3823	15th- & 16th-Century Florence, Rome & Venice: Rethinking Renaissance Visual Culture	3
or		
Other architectural history courses approved by the minor advisor		

* If more than 3 units are taken, the extra units will be counted in the elective category.

Elective courses:

9 units of elective course work in architecture (A46), landscape architecture (A48), or urban design (A49):

These may include courses in design, history/theory, technology, fabrication, sustainability, social issues or other topics. Students may also choose additional architecture studio courses to fulfill this requirement.

The Minor in Landscape Architecture

The minor in landscape architecture (https://samfoxschool.wustl.edu/academics/college-of-architecture/minors/landscape-architecture/) introduces foundational aspects in the practice and scholarship of the built environment. The discipline of landscape architecture thrives in diversity, embracing the nuances and complexities of physical, biological and climatological systems.

The minor exposes students in any major to a range of design scales from the urban environment to the garden, with a focus on public space, infrastructure and new and old media. Courses introduce how the design of landscape affects the social, cultural and ecological dimensions of the world. History and theory complement science and the arts to equip students with the tools, knowledge and innovative

skills to enrich any major. Students take one design methods course, with non-architecture majors completing ARCH 144 Architecture for Non-Architects and architecture majors completing the ARCH 312B Architectural Design IV or ARCH 412B Architectural Design VI Urban Design + Landscape Systems Option Studio. Students pursuing the minor also take one landscape history course, one ecological systems course, and two landscape architecture electives, with options varying each semester. The minor advisor can help determine courses that best meet the student's area of interest.

At least 12 of the 15 credit units must be applied exclusively to the minor and cannot be double-counted toward another major or minor.

Students interested in the minor should contact the minor advisor, Eric Ellingsen (https://samfoxschool.wustl.edu/people/faculty/147-eric-ellingsen/).

Units required: 15, including the following:

Required courses:

3 units of design methods:

Code	Title	Units
Non-Architecture Majors:		
ARCH 144	Architecture for Non-Architects	3
Archihtecture Majors: Urban Design + Landscape Systems Option Studio *		
ARCH 312B	Architectural Design IV	6
or ARCH 412B	Architectural Design VI	

* For architecture majors, only 3 units count toward minor.

3 units of landscape history:

Code	Title	Units
LAND 571A	Landscape Architecture History & Theory (both courses offered fall only)	3
or LAND 574A	Modern and Contemporary Landscape Architecture	

3 units of ecological systems:

Code	Title	Units
LAND 551A	Landscape Ecology (spring only)	3
or		
Other ecological systems courses as approved by the minor advisor		

Elective courses:

6 units of landscape architecture electives:

Code	Title	Units
Any 300-level or above A48 Landscape Architecture course		
or		
Any 300-level or above L82 Environmental Studies course approved by the minor advisor		
or		
Other elective courses in Landscape Architecture approved by the minor advisor		

The Minor in Urban Design

The minor in urban design (https://samfoxschool.wustl.edu/academics/college-of-architecture/minors/urban-design/) provides a platform for students in all majors to explore issues related to the urban condition. Within this framework, students explore urbanization processes in the context of design application and tools, critical and urban issues, urban history, and theory and its application to real-world scenarios.

Aging infrastructure networks; pressures on access to education; overextended health care systems; the loss of other public investments; false securities in the housing market; spatial exclusion based on class, race and gender; the dispossession of local inhabitants from common resources or food supply interruptions; the vulnerability and degradation of the environment; and wasteful forms of consumerism for the sake of capital accumulation all seem to be thriving themes in and around urbanization today.

Over the last three decades, the field of urban studies has received overwhelming attention from design disciplines as well as from others outside the world of design. This has led to an outpouring of scholarly and political discourse challenging the image — as well as the perception of — what is considered urban today.

Students take one design methods course, with non-architecture majors completing ARCH 144 Architecture for Non-Architects and architecture majors completing the ARCH 312B Architectural Design IV or ARCH 412B Architectural Design VI Urban Design + Landscape Systems Option Studio. The minor also includes one foundations course, one advanced urban design course, and two urban design electives, with options varying each semester. The minor advisor can help determine courses that best meet the student's area of interest.

At least 12 of the 15 credit units must be applied exclusively to the minor and cannot be double-counted toward another major or minor.

Students interested in the minor should contact the minor advisor, Petra Kempf (https://samfoxschool.wustl.edu/people/faculty/156-petra-kempf/).

Units required: 15, including the following:

Required courses:

3 units of design methods:

Code	Title	Units
Non-Architecture Majors:		
ARCH 144	Architecture for Non-Architects	3
Architecture Majors: Urban Design + Landscape Systems Option Studio*		
ARCH 312B	Architectural Design IV	6
or ARCH 412B	Architectural Design VI	

* For architecture majors, only 3 units count toward minor.

3 units of foundations:

Code	Title	Units
ARCH 307X	Community Building	3
or ARCH 421W	Designing the Modern City	

3 units of advanced course work chosen from the following:

Code	Title	Units
MUD 656	Metropolitan Urbanism	3
MUD 652H	Metropolitan Development: What's in a Plan?	3
MUD 658	Metropolitan Sustainability	3

Elective courses:

6 units of urban design electives:

Code	Title	Units
Any 300-level or above A49 Urban Design course		
or		
Other elective courses approved by the minor advisor		

Courses

- **A46 ARCH (p. 7):** Architecture
- **A48 LAND (p. 32):** Landscape Architecture

Architecture

Visit online course listings to view semester offerings for A46 ARCH (https://courses.wustl.edu/CourseInfo.aspx?sch=A&dept=A46&crslvl=1:4).

A46 ARCH 111C Introduction to Design Processes I
The first year of the core studio sequence examines interactions between architecture and environments through the design of a small-scale project. Key concerns include global climate change, ecological systems, and sustainability. This year emphasizes experimentation in which students search for a conceptual position relative to architecture history, theory, and culture via the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on engagement with abstraction, context, and temporality in a series of design projects that include: (1) a body device, (2) a ground, and (3) a temporary structure. Exercises explore problems of translation between 2 and 3-dimension, site and climate study and design, and narrative design. Introduction to Design Processes I is the first in the series of the five required core studios in the undergraduate architecture program. No prerequisites.
Credit 4.5 units.

A46 ARCH 112C Introduction to Design Processes II
The first year of the core studio sequence examines interactions between architecture and environments through the design of a small-scale project. Key concerns include global climate change, ecological systems, and sustainability. This year emphasizes experimentation in which students search for a conceptual position relative to architecture history, theory, and culture via the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on engagement with surfaces, flows, and assemblies in a series of design projects that include: (1) a tectonic surface, (2) land and waterscapes, and (3) a gathering space. Exercises explore problems of size and scale, object to field, and figure-ground. Introduction to Design Processes II is the second in the series of the five required core studios in the undergraduate architecture program. Prerequisites: Successful completion of A46 111C or A46 144 with a grade of C- or better.
Credit 4.5 units.

A46 ARCH 144 Architecture for Non-Architects
Architecture for Non-Architects introduces non-architecture students to the process through which architects think about, view and produce the built environment. This new course is meant to serve as an alternative to the traditional studio instruction in the major, thus allowing students who are curious about architecture to experience it without the demands and commitment of major courses. If a student decides to transfer into the architecture major later on, they will meet with the architecture minor lead advisor to jointly propose a planned course of study that addresses any missing credits and foundational skills required for successful completion of the architecture major. This foundational course proposes a combination of readings, class discussions and research that will be used to inform the design process. Field trips will initiate students into the act of seeing by challenging them to observe, interpret and critically engage with the built environment ("the site") and those who are affected by it ("the stakeholders") in specific scalar and temporal contexts.
Credit 3 units. EN: H

A46 ARCH 151 Representation I
This course introduces students to the ever-expanding, extra-disciplinary array of tools, techniques, software, equipment, and media at play in architectural representation. Organized as a lab, the course presents a series of one to three-week-long, in-class exercises that focus on skill-building and encourage experimentation within a narrow framework. Three primary areas of focus include visualization (freehand drawing, hand-mechanical projection, digital model-making, digital projection, and photography), fabrication (hand model-making, woodworking, and CNC routing), and curation (portfolio design, display, and presentation.) Representation I is the first in the series of two required representation workshops in the undergraduate architecture program. No prerequisites.
Credit 1.5 units.

A46 ARCH 152 Representation II
This course introduces students to the ever-expanding, extra-disciplinary array of tools, techniques, software, equipment, and media at play in architectural representation. Organized as a lab, the course presents a series of one to three-week-long, in-class exercises that focus on skill-building and encourage experimentation within a narrow framework. Three primary areas of focus include visualization (freehand drawing, hand-mechanical projection, digital model-making, digital projection, and photography), fabrication (hand model-making,

woodworking, and CNC routing), and curation (portfolio design, display, and presentation.) Representation II is the second in the series of two required representation workshops in the undergraduate architecture program. Prerequisites: Successful completion of A46 151 with a grade of C- or better.
Credit 1.5 units.

A46 ARCH 185 Practices in Architecture, Landscape Architecture, and Urban Design

This course offers first-year students in the College of Architecture an introduction to the subjects, theories, and methodologies of the disciplines of architecture, landscape architecture, and urban design. Examples are drawn from a range of historical periods, and contemporary practice highlights distinct processes of thinking and working in each discipline and areas of intersection and overlap. Concurrent registration in A46 112C or A46 144 is recommended.
Credit 3 units.

A46 ARCH 209 Design Process

Open to Engineering, Arts & Sciences, Business, and Art students at all levels. This studio course will engage students in the process of design with an emphasis on creative thinking. Course content relates directly to the interests of engineers, arts & science, business and art students who wish to problem solve about positively shaping the texture and quality of the built world. A series of 2D & 3D hands-on problem-solving projects introduce students to design concepts as they apply to site (eco-systems and outdoor places), to humanistic place making (personal and small public spaces), to structure & materials (intuitive exploration of structural principles though model building), to environmental issues (effects of climate, light, topography, context and sensible use of natural resources). No technical knowledge or special drawing/model-making skills are required. There will be informal group and individual discussions of each person's stages in inquiry. The investigations will take the form of study models made of recycled materials. Guest lecturers will participate throughout the semester. The concluding project for the semester will allow each student to work with their unique academic and personal interests, utilizing the process of lateral thinking. Course fee is applied to cost for mandatory fingerprint background check.
Credit 3 units. Art: CPSC

A46 ARCH 211D Architectural Design I

The second year of the core studio sequence examines interactions between architecture and technology through the design of a medium-scale project. Key concerns include transformative emerging technology, cultural and material production, and labor practices in relation to digital tools and systems. This year emphasizes choice as students are supported in clarifying their conceptual position relative to architecture history, theory, and culture via the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on engagement with materials, cladding, and interiors in a series of design projects that include: (1) modules, (2) a screen, and (3) a live/work space. Exercises explore problems of part-to-whole relationships, cladding and ornament, and public and private space. Architectural Design I is the third in the series of the five required core studios in the undergraduate architecture program. Prerequisites: Successful completion of A46 111C or 144 and A46 112C with a grade of C- or better.
Credit 6 units.

A46 ARCH 212D Architectural Design II

The second year of the core studio sequence examines interactions between architecture and technology through the design of a medium-scale project. Key concerns include transformative emerging technology, 8 cultural and material production, and labor practices in relation to digital tools and systems. This year emphasizes choice as students are supported in clarifying their conceptual position relative to architecture history, theory, and culture via the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on engagement with representation, technology, and circulation in a series of design projects that include: (1) a drawing device, (2) a fabrication analysis, and (3) a production and display space. Exercises explore problems of representation and mediation, architectural labor and automation, and mass and volume. Architectural Design II is the fourth in the series of the five required core studios in the undergraduate architecture program. Prerequisites: Successful completion of A46 111C or A46 144, 112C, and 211D with a grade of C- or better.
Credit 6 units.

A46 ARCH 241 Community Dynamics

This course builds on the investigations of A46 307X and concentrates on the economic, political and social dynamics shaping neighborhoods. To ground discussions in reality, the class immerses itself in the urban laboratory of St. Louis while relating local issues to broader trends. A survey of the paradigms of American urban design and planning will provide an overview of the creative strategies (and ongoing contradictions) of redevelopment in the 21st century. Students will be exposed to a range of research methods for understanding the deep, relational, political and legalistic dynamics that shape communities.
Credit 3 units. Art: CPSC

A46 ARCH 2647 Italian Language (Florence)

This course covers Italian grammar and conversation for study abroad students in Florence. Taught entirely in Italian. There is an emphasis on class participation accompanied by readings and writings. The student develops facility speaking the language on an everyday basis.
Same as F20 ART 2647
Credit 3 units.

A46 ARCH 2661 Semester Abroad Program Seminar

This course will prepare students participating in the Sam Fox School's Semester Abroad Programs. The seminar will meet eight times over the course of the semester. Attendance is mandatory for students going abroad. Prerequisite: College of Art and College of Architecture students selected for the Sam Fox School Abroad Programs.
Same as F20 ART 2661
Credit 1 unit. EN: H

A46 ARCH 275 Service Learning Course: Environmental Issues

This service learning experience allows Washington University students to bring their knowledge and creativity about the many subjects they are studying to students at the Compton-Drew Middle School, which is adjacent to the Science Center in the City of St. Louis. This course is for Arts & Sciences students of differing majors and minors, business students, architecture and art students, and engineering students from all engineering departments. During the first third of the semester, students will do the follwing: 1) begin learning the creative process of lateral thinking (synthesizing many variables, working in cycles); 2) work with a teammate to experiment with the design of two- and three-dimensional hands-on problem-solving workshops about exciting environmental issues for small groups of students at Compton-Drew Middle School; 3) devise investigations for the workshops about environmental issues embracing the sciences, the humanities, and the community; and 4) work with the professor (both individually and with their team) as well as faculty from a specific disicipline to prepare their evolving curricular plan. During the last two thirds of the semester, students will be on site during the Compton-Drew school day (once a week for an hour and a half) to teach small-group workshops for some of the sixth- and seventh-grade students. This course is open to first-year students, sophomores, and juniors.

Credit 2 units.

A46 ARCH 300A Design Foundations Studio

This is an intensive three-week course that sets students up to enter the first of a two-semester studio sequence. The first-year sequence introduces students to architectural design, focusing on conceptual, theoretical, and tectonic principles. Enrollment is open to first-semester MArch 3 students only.
Credit 3 units.

A46 ARCH 303B Design Drawing

Drawing is a fundamental act that is intrinsic to who we are as visual designers, visual thinkers, visual learners, visual problem solvers, and visual communicators. We drew even before we could write. It is an integral part of a design process and foundational to how we navigate the digital world. This course will explore all these aspects of drawing and its role in today's culture. It is a hands-on course that allows students to explore and experiment with a variety of representational media, including freehand drawing, rendering, and digital drawing. An emphasis will be put on drawing as a way of searching for and discovering design solutions. The majority of the drawings produced will not be ends in themselves as finished products; rather, drawing will serve as a process-driven medium for exploring new ideas and design solutions.
Credit 3 units.

A46 ARCH 303C Unveiling the Detail: A Lesson in Forensic Drawing & Discovery

This course will explore architectural detailing from the quotidian to the sublime to posit architectural design intent. Through fieldwork and research, students will study the role of architectural detailing in the configuration and execution of architectural space making. Students will be asked to carefully observe their own constructed environment and architectural precedents to understand the truth and fiction in construction. This course seeks to help students understand the role of the architectural detail in articulating and reinforcing architectural concepts. It will strengthen the student's understanding of material properties, opportunities and limitations, construction sequencing, and design execution. Students will gain a new appreciation for the exquisitely executed architectural detail and strengthen the skill to anticipate and navigate detailing challenges in their own design work. Students will be asked to explore architectural details through various drawing methods, modeling, and modes of representation. This course is open to architecture students at all levels with an interest in drawing and realizing architecture as a constructed practice.
Credit 1.5 units.

A46 ARCH 304 Shared Ecologies and Design

This interdisciplinary course will introduce biological, social and cultural ecology concepts to proactively address current stressors that impact and are being impacted by design and the built environment. These effects and affects range from (but are not limited to) climate change science; racial and social justice impacts; sustainability, resiliency and adaptation-design strategies; systems-based and multiscalar understandings; and interrelational human and non-human environments bound in both acting and being acted upon locally and globally.
Same as A48 LAND 304
Credit 3 units. Arch: ECOL

A46 ARCH 307X Community Building

This course looks at the intersection of the built fabric and the social fabric. Using St. Louis as the starting point, this course takes students out of the classroom and into a variety of neighborhoods -- old, new, affluent, poor -- to look at the built environment in a variety of contexts and through a variety of lenses. Almost every week for the first half of the semester, students visit a different area of the city, with each trip highlighting some theme or issue related to the built environment. These include topics such as architecture, planning, American history, investment and disinvestment, community character and values, race, transportation, immigrant communities, and future visions. Running parallel to this, students will be involved in an ongoing relationship with one particular struggling neighborhood, in which students will attend community meetings and get to know and become involved with the people of the community in a variety of ways. Students learn to look below the surface and beyond the single obvious story for multiple stories to discover complexity, contradictions and paradoxes. They also come to consider the complex ways in which architecture and the built environment can affect or be affected by a host of other disciplines. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Students will add themselves to the wait list and will be administratively enrolled in the course. This course fulfills the Sam Fox Commons requirement.
Credit 3 units. Art: CPSC

A46 ARCH 308B Engaging Community: Understanding the Basics

What does it mean to engage in community as a creative practitioner? Community engagement must be grounded in authentic relationship building and an ability to understand and act within the historic context and systems that impact communities. We will practice the skills of listening, observation, reflection, and improvisation. We will cultivate mindsets that focus on community assets and self-determination. Workshops will teach facilitation and power analysis, with the intention of upending the power dynamics between community and creators. It may count toward the minor in Creative Practice for Social Change if bundled with "You Are Here: St. Louis' Racial History Through Sites and Stories."
Same as F20 ART 308B
Credit 1.5 units. Art: CPSC

A46 ARCH 308H Alberti Program: In the Public Schools

The Alberti Program is a problem-solving studio workshop about architecture, community, and the environment. WashU students enrolled in this course will serve as teachers: developing curriculum and visiting classrooms in regional public schools to teach 2D and 3D hands-on problem-solving projects. They will serve as guides for student participants through the field of architecture, the design process, and sustainable design within lectures and discussions regarding projects they will undertake. WashU students may earn a maximum of 3 credits for this course. This course requires off-site travel, arranged once the semester has begun. NOTE: Students enrolled in this course must pass a background check in order to remain enrolled.
Credit 3 units.

A46 ARCH 311B Architectural Design III

The third year of the core studio sequence examines interactions between architecture and society through the design of a large-scale project. Key concerns include architectural agency, community activism, and socioeconomic justice. This year emphasizes voice as students adopt their own conceptual position relative to architecture history, theory, and culture via the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on engagement with tectonic assemblies, public space, and programming in a series of design projects that include: (1) a precedent analysis, (2) a detailed study of the project's urban context, and (3) a mixed-use vertical structure. Exercises explore problems of grids and frames, urban and architectural space, and programmatic interrelationships. Architectural Design III is the fifth in the five required core studios in the undergraduate architecture program. Prerequisites: Successful completion of A46 111C or A46 144, 112C, 211D, and 212D with a grade of C- or better. Concurrent registration in Building Systems I is required.

Credit 6 units.

A46 ARCH 312B Architectural Design IV

The third and fourth years introduce a selection of option studios to students. This year emphasizes voice as students adopt their own conceptual position relative to architecture history, theory, and culture through the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on advanced architectural design and an in-depth study of a specific topic through rigorous design development. Prerequisites: Successful completion of A46 111C or A46 144, 112C, 211D, 212D, and 311B with a grade of C or better.
Credit 6 units.

A46 ARCH 315B Historic Preservation, Memory and Community

Whose history is significant enough to be worth preserving in physical form? Who gets to decide, and how? Does the choice to preserve buildings, landscapes and places belong to government, experts or ordinary people? How does the condition of the built environment impact community identity, structure and success? This place-based course in historic preservation pursues these questions in St. Louis' historically Black neighborhood The Ville, where deep historic significance meets a built environment conditioned by population loss, disinvestment and demolition. The course explores the practice of historic preservation as something far from neutral; rather it is viewed as a creative, productive endeavor that mediates between community values, official policies and expert assertion. Critical readings in preservation and public history will accompany case studies, community engagement and practical understanding.
Credit 3 units. Arch: GAUI, UI

A46 ARCH 316F Re-Discover the Child

It is said that, at this time in history, the entire country must make a commitment to improve the positive possibilities of education. We must work to lift people who are underserved; we must expand the range of abilities for those who are caught in only one kind of training; and we must each learn to be creative thinkers contributing our abilities to many sectors of our society. In this course, we will expand our views about learning by experimenting with the creative process of lateral thinking. We will learn about learning by meeting with some brilliant people at the university and in the St. Louis community who are exceptional in the scholarly, professional, and civic engagement work they are accomplishing. We will learn about learning by working in teams to develop exciting curriculum (based on the knowledge and passion students bring from their academic studies and interests) for middle-school students from economically disadvantaged urban families. Each week, we will learn about learning by giving two- or three-dimensional hands-on problem-solving workshopsfor middle school students at the Compton-Drew Middle school, which is adjacent to the Science Center in the City of St. Louis. Student teammates will implement the workshops they create throughout the semester for a group of six to eight Compton-Drew middle-school students. In this course, we celebrate the choices of studies we each pursue, and we expand our experience in learning from each other's knowledge bases and from each person's particular problem-solving creativity. This course seeks students from all disciplines and schools during any year of study.
Credit 3 units. Art: CPSC

A46 ARCH 316T Printmaking for Architecture and Art Students

This course will focus on monotype mixed media printmaking using both a press and digital print processes. The course is designed to be responsive to current issues with a focus on contemporary printmaking practices and various ideas about dissemination in the age of social media. The course will include an examination of historical examples of diverse global practices; prints made in periods of uncertainty, disruption, war, and disaster; and speculative projects by architects such as Superstudio, Zaha Hadid Architects and Archigram. Students will be expected to create a series of work with a conceptual framework developing a personal visual language.
Same as F20 ART 316T
Credit 3 units. Art: FAAM EN: H

A46 ARCH 316X Cycles

Students design and build human-powered vehicles from discarded bicycles. The course collaborates with student mechanics involved with Bicycle Works (Bworks). Bworks collaborates in teams with Washington University students to design and build the work.
Credit 3 units. EN: H

A46 ARCH 317A Architectural Design I (MArch 3)

The first of a two-semester sequence that introduces students to architectural design, focusing on conceptual, theoretical, and tectonic principles. Enrollment is open to first-semester MArch 3 students only.
Credit 9 units.

A46 ARCH 317M Architecture Through the Photographic Lens

Same as F20 117M, F20 217M, and F20 417M; juniors (only) register for F20 317M. Photography offers ways of seeing and representing the world around us. This course provides technical and conceptual frameworks for understanding architectural space as seen through the camera. Topics include the building as site, landscape as context, and the architectural model as a representation tool. Students are introduced to a wide range of artists and architects, which helps them to build a unique camera language to support their individual projects. Students will learn DSLR camera basics, fundamentals of Photoshop, digital printing techniques, and studio lighting for documenting architectural models. The course assumes no prior experience with digital imaging technologies or materials. Digital camera required.
Same as F20 ART 317M
Credit 3 units. Art: FAAM

A46 ARCH 318A Architectural Design II (MArch 3)

The second of a three-semester sequence of core design studios, which continues the examination of issues raised in ARCH 317. Enrollment is open to second-semester MArch 3 students only.
Credit 9 units.

A46 ARCH 323A Architectural Representation I (MArch 3)

This course examines the history/theory and practice of representation, specifically the systems of drawing used in architecture. The objective is to develop the requisite discipline, accuracy, and visual intelligence to conceptualize and generate a relationship between space and form. The course focuses on two concurrent tasks: first to outline and analyze the historical development of representational logics and their impact on architectural ideation, and second to explain the codification and usage of specific geometries, including orthographic and isometric projection, central and parallel perspective, and architectural axonometric. We will see that, rather than a translation of reality, representation operates between perception and cognition as a transcription of reality and is thus a powerful instrument in the design and making of architecture. The relationship between the drawing forms and the tools used to produce them are brought into focus as manual, digital, photographic and physical applications driven by drawing intentions. The course is organized as a lecture/lab with emphasis on practice of manual and photographic applications.
Credit 3 units.

A46 ARCH 323B Architectural Representation II (MArch 3)
The course examines the history/theory and practice of representation, specifically the systems of drawing used in architecture. The objective is to develop the requisite discipline, accuracy and visual intelligence to conceptualize and generate a relationship between space and form. The course focuses on two concurrent tasks: first, to outline and analyze the historical development of representational logics and their impact on architectural ideation, and second, to explain the codification and usage of specific geometries, including orthographic and isometric projection, central and parallel perspective, and architectural axonometric. We see that, rather than a translation of reality, representation operates between perception and cognition as a transcription of reality and is a powerful instrument in the design and making of architecture. The relationship between the drawing forms and the tools used to produce them are brought into focus as manual, digital, photographic and physical applications driven by drawing intentions. This course is organized as a lecture/lab with emphasis on the practice of digital media and physical modeling. Emphasis is on participation and excessive absences are noted. Please note: The second half of the semester focuses on computing, for which each student is required to have a laptop computer.
Credit 3 units.

A46 ARCH 326G Digital Fabrications
This course will focus on fabrications both real and virtual. The ubiquity of computers in design, studio art, communications, construction and fabrication demand that professionals become comfortable with their use. It is also important in a group of ever-specializing fields that one knows how to translate between different software and output platforms. This comfort and the ability to translate between platforms allow contemporary artists and designers to fabricate with ever-increasing freedom and precision. This course will introduce students to 3D software with a focus on 2D, 3D, and physical output. Through a series of projects, students will learn to generate work directly from the computer and translate it into different types of output. Starting from first principles, this course will cover the basics from interface to output for each platform used. This course will also familiarize students with a range of CNC technology and other digital output for both small- and large-scale fabrication. The course will be broken into three projects. In the first project, students will focus on computer-generated geometry and control systems. In the second part, students will generate physical output and line drawings. The final project will focus on rendering, context and cinematic effects. The software covered in this course includes, but is not limited to: Rhinoceros 3D, Maya, Illustrator, Photoshop. Additionally, students will use the 3D printer, laser cutter, and/or other digital output tools.
Credit 3 units.

A46 ARCH 326J Digital Representations
Digital Representations introduces students to digital modeling and fabrication, parametric workflow, and various 2D and physical output techniques. Starting from first principles, this course begins with the basics from interface to output for each platform used, developing skills in digital modeling and physical output and serving as a prerequisite for more advanced courses in design scripting and digital fabrication. Students complete a semester-long project divided into three assignments, beginning with developing a detailed digital model of a formal precedent, which introduces students to basic skills in modeling with nurbs, subdivision surfaces, and meshes. Continuing to develop a clear diagrammatic organization and hierarchy, students expand the characteristics of their original formal precedent using Grasshopper to create a set of dynamic, flexible behaviors. Drawing upon their initial understanding and analysis of organizational systems within their formal object, students transfer their observations into the construction of a spatial parametric model that has potential to serve structure, fabrication methods, and material assembly. Finally, students

develop their digital model into a geometrically rationalized material system that draws upon their initial precedent, producing a physical model, renderings, and 2D drawings presented in the format of a final review.
Credit 3 units.

A46 ARCH 326K Digital Evolutions: Parametric Design for a Fabricated Species
Digital Evolutions will introduce digital modeling, parametric workflow, and fabrication techniques in a variety of two and three-dimensional media to document the imagined development of a hypothetical animal species. As a prerequisite for more advanced courses in design scripting and digital fabrication, this course will introduce each technique at a foundational level giving every student a new arsenal of digital tools with which they can act as evolution's (intelligent) designer. Students will begin with an analysis of drawings by Ernst Haeckel (1843-1919), a German biologist, naturalist, philosopher, and artist who promoted and popularized Charles Darwin's work in Germany, but whose own alternative theories of evolution have subsequently been discredited. Students will use Grasshopper and associated plug-ins to exploit the powerful flexibility of parametric design to iteratively adapt these studies to various imagined environmental conditions. Working in pairs, students will crossbreed their species, synthesizing ideas concerning skin, support systems, pattern, and kinetics, finally modeling this fictitious entity with a geometrically rationalized material system-a fabricated fabrication.
Credit 3 units. Arch: HUM Art: FADM

A46 ARCH 326L Anxious Vision: Real Time and the Architecture of Video Games
What can architects learn from examining the visual structures of 3D video games? How have they influenced the culture of architectural representation? Why should the gaming perspective view and level structure be considered essential elements for contemporary architectural theory? How is video game theory instrumentalized in the creation of architecture? To begin, video game engines are becoming ubiquitous features in architectural rendering culture. Platforms like Unreal, Unity, and Twinmotion offer designers tools to create environments that can be explored and interacted with in real time by the user-client. Although 3D modeling, rendering, and animation platforms have been commonplace in architecture schools and experimental studios since the 1990s, accessible, interactive, real-time rendering platforms are a more recent and less studied phenomenon. The architecture of level design and the companion art of worldbuilding constitute a new representational paradigm. In this seminar, we will examine the spatial structures of contemporary gaming titles and explore a series of historical and theoretical texts from Video Game Studies. The final assignment will be project-based and designed using the Unreal Engine.
Credit 3 units.

A46 ARCH 326Q Evolution of a Section: Architecture and Machine Learning
Throughout human history, architecture was seen as static, a quality attributed to its inherent physicality. This seminar encourages students to conceive of an architecture, through the medium of an architectural section, that mutates across space and time. Using Machine Learning processes, the class intends to propose an alternative and nonlinear means of production to the linear process of architectural design from conception to construction. Machine learning engages graphic information differently than designers do. All fidelity towards visual, cultural, political, and geometrical context is lost, resulting in a new class of compositions that are unique but not critical. The systems, including Generative Adversarial Networks, Convolutional Neural Networks, and Diffusion Models, are explored with input (images/texts) and analyzed as output images. We will collectively conjecture on how

to 'train' the AI models to understand spatial features typical of an architectural section. We will rely on the rich history of architectural sections, across time, styles, and media, to inform the potential trajectories that our section follow. The works of contemporary artists and architects, like Matias Del Campo, Gabriel Esquivel, Helena Sarin, Refik Anadol, etc. who work with Machine Learning technologies, will be analyzed to understand approaches towards AI and Design.
Credit 3 units.

A46 ARCH 327D Digital Lighting Design: Rapid Prototyping and the CNC
Students in this course will develop an intimate understanding of CNC technology and its ability to rapidly prototype and fabricate within an iterative design process. Through an accelerated feedback loop, the class will work quickly through maquettes, renderings, prototyping, and fully formed products multiple times within the semester. Lectures will include both current and historic approaches to lighting design to better inform the initial drawing process. This course will also include technical instruction on CNC, processes specific to the equipment at Sam Fox. Coursework will culminate in an exhibition of lighting displays and relevant documentation to accompany the research. Students wishing to enroll in this class should have a functioning knowledge of Rhino.
Credit 3 units.

A46 ARCH 327W Color in Space | Space in Color
It is perhaps not a coincidence that one of the main literatures on color still relevant today - Josef Albers' Interaction of Color (1963) - has its origins in the Bauhaus pedagogy. After all, color is a major design element that alone has the power to transform a space. Color ignites the imagination, holding the potential to elevate being in a space into an emotional experience. In this design seminar, students will investigate the use of color in architecture and spatial practices. Architectural practitioners and artists - from Josef & Anni Albers, Luis Barragán, Hélio Oiticica, Bridget Riley, James Turrell, Olafur Eliasson, James Casebere, Bruce Nauman, and others - will be the subject of a number of case studies. Short weekly lectures will be presented on selected topics and concepts such as color theory, simultaneous contrast, perception and optical mixing of color, use of artificial and natural light, interactive effects and relationships of colors, color as a prominent compositional and spatial element, environmental influence on color, among others. In tandem with the lectures, students will work on a small series of independent explorations studying color and light phenomena in physical modeling, drawing, photography and digital color mapping. The goal is to inspire architecture and urban design students with the expressive and poetic qualities of color and its potential material depth.
Credit 3 units.

A46 ARCH 327X Color Systems
This course is a sustained investigation of color. Students study how color is affected by light, by space, by arrangement, by culture, and by commerce. The course aims to deepen the understanding of color's complexity and pervasiveness as a fundamental element of shared visual culture. The course develops both technical and conceptual skills to aid in visual translation. In addition to color-specific inquiry, a goal is to expand ideas of research and enable students to integrate various methods of acquiring knowledge into their art and design practice. Throughout the course, students discuss various processes of making/constructing, the connection between color/form/concept, and strategies for idea generation and brainstorming. The course allows for much individual freedom and flexibility within varying project parameters. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fulfills Sam Fox Commons requirement. Prerequisite: Drawing I, Communication Design I, or 2D Design, or permission of instructor.
Same as X10 XCORE 327X

Credit 3 units. Art: FADM EN: H

A46 ARCH 3280 Architectural History I: Antiquity to Baroque
This lecture course will introduce major historical narratives, themes, sites, and architects from ancient Greece to the end of the Baroque period. We will take an extended look at the dawn of the modern period during the 15th and 16th centuries through a global perspective, turning eastward from Renaissance Europe to the Ottoman, Mughal, Chinese, and Japanese empires. The great chronological and geographic span of this course will be pulled together around the themes of classicism and its subsequent reinterpretations as well as the pursuit of the tectonic ideal. Our aim is to recognize how these ideological pursuits of modern architecture evolved out of longer historical processes. We will also pay close attention to major sites of landscape and urban-scale work. Requirements will include a mid-term exam, a final exam, and a series of short papers.
Credit 3 units.

A46 ARCH 3284 Architectural History II: Architecture Since 1880
An introductory survey of the history and theory of architecture and urbanism in the context of the rapidly changing technological and social circumstances of the past 120 years. In addition to tracing the usual history of modern architecture, this course also emphasizes understanding of the formal, philosophical, social, technical and economic background of other important architectural directions in a global context. Topics range from architects' responses to new conditions in the rapidly developing cities of the later 19th century, through early 20th-century theories of perception and social engagement, to recent efforts to find new bases for architectural interventions in the contemporary metropolis.
Credit 3 units. Arch: HT

A46 ARCH 331A Experimental Formwork
Our perception of concrete is typically determined by the mold that gives it its shape and not the material itself. Given the fluidity of the material in its plastic state, the desired morphology and configuration once cured relies on its molding possibilities. During this seminar students will explore the essence of mold making, its possibilities and limitations as containers of a fluid material that will determine its final shape and surface quality. Starting from an understanding of standard molding procedures, students will explore a wide range of non-conventional formwork techniques such as flexible fabric, pneumatic, 3d printing, dynamic casting, rotoforming and others. Students will produce physical molds and cast prototypes in concrete or other materials through a process of experimentation and discovery. The ultimate goal of this course is to use formwork as an active and accessible design tool and fertile ground for innovation. Particular emphasis will be on discovering relationships between material properties and production methods as a way of finding systematic approaches that can lead to making prototypes combining digital and/or analog tools. Students are expected to develop creative processes that can be applicable to unprecedented and novel casting techniques and potentially to manufacturing methods of actual building components. The course is structured around an initial lecture about mold making precedents and possibilities, specific readings, a short research on traditional and other current -non-traditional- mold techniques and hands-on work. Students will work individually to fabricate small mold prototypes (6" x 6" x 6"), cast concrete or other fluid materials readily available to perform tests and produce accurate representation of the outcomes and its process. The course is open to undergraduate and graduate students.
Credit 1.5 units.

A46 ARCH 332A 1 House
In this seminar, students will research and develop designs for a completely off-the-grid "small" house in Boquete, Panama, for Kaylee and Jordan of the Nomadic Movement YouTube channel. With input from Kaylee, Jordan, and their crew, students will research traditional sustainable building practices in Panama and develop schematic designs for a small house to be built by them on their property in Boquete, with construction beginning in May 2021. The course will include instruction in residential design, structure, and materials and methods of construction. A subtext of the course will be entrepreneurship and beginning one's practice as an architect. To this end, students will be asked to write a prospectus for their architectural practice, including naming, branding, and producing their first YouTube video.
Credit 3 units.

A46 ARCH 333A Matsumoto Modern
Between 1948-1961, the Japanese American architect George Matsumoto designed more than 30 award-winning residences in North Carolina. The houses -- demonstration homes for General Electric and Westinghouse, vacation houses sponsored by Women's Day and the Douglis Fir Plywood Association, and homes for clients interested in new ideas in architecture -- served as prototypes for domestic living inspired by postwar logics of mass production. The experimental homes provided opportunities to challenge norms and amplify particular design aspects through focused investigations of the potential of new materials, innovative construction systems, or provocative formal capabilities. Like the more well-known Art and Architecture magazine's Case Study House Program on the West Coast, Matsumoto's houses aspired to be functional, beautiful, and affordable while providing a model for modern American domesticity. Students in the course will undertake archival research for selected George Matsumoto-designed modern homes throughout the semester. Course work will include experimental, analytical drawings; archival research and writing; museum-level physical models; and other representations of residential work by Matsumoto. The resulting work is anticipated to be included in a future publication, an exhibition, and as a featured part of the larger research project Beauty in Enormous Bleakess: The Interned Generation of Japanese American Designers, which aspires to "tell an urgently needed new chapter in design and architectural history that acknowledges the signal contributions of Japanese Americans to post-war culture and cultural life."
Credit 3 units. Arch: CAST, GACS

A46 ARCH 336D Biomimicry: A Biokinetic Approach to Sustain(Able) Design
There is a conceptual similarity between the way an organism and a building engage their respective environments. A biological system responds to the unique condition of its ecosystem; architecture responds to the unique conditions of the site. Building on this principle are the fields of biomimicry, the study of design and process in nature, and biokinetics, the study of movement within organisms, and their ability to address architectural problems with elegant, technologically advanced, sustainable solutions. Biomimicry: A Biokinetic Approach to Sustain(Able) Design focuses on kinetics as an essential element of biomimicry in the context of architecture and employs the study of the kinetic aspects of biological systems — structure, function and movement — to inform the design and engineering of buildings. A systematic approach to researching and translating the kinetic function of organisms leads to a successful bridging of biological and architectural concepts.
Credit 3 units.

A46 ARCH 336E Biomimicry, Teleology and Organic Architecture
This seminar is intended to develop an understanding of the history and evolution of biomimicry as a significant design tool from the emergence of biology as a science in the early 19th century to the present. Biology was the first discipline to confront the problem of teleology, of design in nature. For the past 100 years, biological references and ideas are present in the work of architects and in the writings of architectural theorists. Biomimicry, a term coined by Janine Benyus, has developed into a new discipline that studies well-adapted organisms' designs and processes and then imitates life's genius to design human applications, aiming at a sustainable development. The intent of this seminar is to establish a systematic approach to research and analysis of the history and theory of this biological analogy and its influence on the history of environmental architecture, as seen through the lens of biomimicry. In addition to a historical analysis, students analyze case studies that exemplify the relationship of architecture to biology, focusing not only on built work, but on the writings and the designer's positions in terms of this relationship. Classes consist of a combination of formal lectures and facilitated discussion periods. In addition, each student chooses a particular architect and, through research and analysis, assesses the influence of biomimicry in their work and presents these results in a paper that includes a critical analysis and a proposal on how to advance the architect's work to the highest level of biomimicry.
Credit 3 units.

A46 ARCH 337N In Detail: Observation, Drawing, & Discovery
This course explores architectural detailing from the quotidian to the sublime to posit architectural design intent. Through fieldwork and research, students will study the role of architectural detailing in the configuration and execution of architectural space making. Students will be asked to carefully observe their own constructed environment and architectural precedents to understand the truth and fiction in construction. This course seeks to help students understand the role of architectural detail in articulating and reinforcing architectural concepts. It will strengthen students' understanding of material properties, opportunities and limitations, construction sequencing, and design execution. Students will gain a new appreciation for the exquisitely executed architectural detail and strengthen the skill to anticipate and navigate detailing challenges in their own design work. Students will be asked to explore architectural details through various drawing methods, modeling, and modes of representation. This course is open to architecture students at all levels with an interest in drawing and realizing architecture as a constructed practice.
Credit 3 units.

A46 ARCH 343A Design As Export
This course introduces students to the contemporary global characteristics of design in the late 20th and 21st century. The marketing, fabrication, distribution and consumption of design is global, yet the cultural and formal identity of most design products are national and regional. How do traditions of design and quality based on centuries of a national and regional design culture react and adapt to a global market? What is the culture of design? What is design identity? Italian design is the primary focus of this course, followed by Japanese and Asian design and manufacturing. Case studies include examples of industrial design, fashion design, communication design and automobile design. The course also includes presentations by design curators and representatives of various international design companies.
Credit 3 units.

A46 ARCH 343X Digital Filmmaking: City Stories
Digital Filmmaking: City Stories is a cross-university video art course for students interested in making short films through a transdisciplinary and time-based storytelling in both narrative and non-narrative formats. Whether documentary or abstract, individually produced or

collaborative, all projects in this course have a required social and urban engagement component. In this course, the City becomes a laboratory for experimentation and contribution. Students meaningfully engage St. Louis, and their projects address sites of concern to explore the complex fabric of the city by way of framing and poetic juxtaposition. City Stories merges several arts and humanities disciplines, including experimental cinema and documentary journalism, and creates an opportunity for empathic listening and inquiry as students discover stories built from collective as well as individual memories.
Same as X10 XCORE 343
Credit 3 units.

A46 ARCH 345A The Corner Problem
The corner problem is a classic architectural challenge of how a material, pattern or system turns a corner. In particular, the class will focus on facades that include sun shading elements, thus increasing the thickness of the assembly. Turning a corner sounds benign until you consider that all materials have thickness, and then the problem reveals itself. This too often results in an oversimplification and thus reduction of the design intent. This course will focus on designing custom facade systems using advanced digital modeling techniques and testing through physical prototypes. Knowledge of material systems and modeling techniques will be supplemented through discussions with industry leaders in facade design and fabrication.
Credit 1.5 units.

A46 ARCH 347F Furniture Design, Emphasis Metal
Students design and make small tables using metal as the primary material. Traditional and emergent technologies will be explored such as welding and use of cnc plasma cutting. No experience is necessary.
Credit 3 units.

A46 ARCH 348A Body as Site: Jewelry Design as Architecture
In this course, students will undertake a 3D printing and casting process to realize an architecturally conceived set of jewelry in metal and create drawings and renderings of this set. Often, metal 3D printed parts are used as industrial components and engineered mechanical parts. This project will reverse that to create delicate objects that engage with skin. Students will create a parure (a set of related pieces of jewelry) that will examine the human body as an architectural site and test the potential of metal 3D printing in architecture. We will use Autodesk Maya to create hyper-articulated surfaces and employ lost wax and lost plastic metal casting, consequently blurring the line between traditional and contemporary techniques. As a result, we will not simply conceive of a project and outsource its production. Instead, we will use the foundry to provide firsthand experience with material processes. The set of pieces will share characteristics of form and geometry as well as tactics of physical interconnection with the human body, adjusting through site-specific responses to finger, wrist, neck, ear, or head. In addition to a set of renderings and drawings, students will produce wax hand-carved models and 3D-printed plastic objects for lost plastic casting. For artifacts that require fine detail, students will outsource their projects to wax 3D-printing and casting facilities. (Outsourcing for a typical ring costs approximately $15 in steel and $35 in silver. Total course costs are estimated to be $100.)
Credit 1.5 units.

A46 ARCH 348B Furniture
This seminar will explore the work of the Italian architect Enzo Mari, with a focus on his autoprogettazione? furniture and book project of 1974. The book offers free designs of furniture that can be built with only a few tools, simple materials, and basic skills, such as measuring, cutting, and hammering. In 2015, Mari granted the Berlin-based CUCULA: Refugees Company for Crafts and Design the rights to redesign and sell the furniture. Students will take up this charge and redesign the furniture from autoprogettazione? again, with each student building a redesigned chair. Please note that this seminar will require students to acquire the following tools: a measuring tape, a hammer, a hand saw, and a hand drill and bits (approximate cost of $75.00 new, $25.00 if the student is resourceful). (The professor will contact the student in 25 years and ask if they still have the tools.)
Credit 1.5 units.

A46 ARCH 350 Service Learning Course: Environmental Issues
This service learning experience allows Washington University students to bring their knowledge and creativity about the many subjects they are studying to students at the Compton-Drew Middle School, adjacent to the Science Center, in the City of St. Louis. This course is for arts and sciences students of differing majors and minors, business, architecture and art students, and engineering students from all engineering departments. In the first third of the semester, students will: 1) begin learning the creative process of lateral thinking (synthesizing many variables, working in cycles); 2) work with a teammate to experiment with the design of 2D and 3D hands-on problem-solving workshops about exciting environmental issues, for small groups of students at Compton-Drew Middle School; 3) devise investigations for the workshops about environmental issues embracing the sciences, the humanities and the community; 4) work with the professor individually and in their team, as well as seek advice of faculty from a specific discipline throughout the semester in the preparation of their evolving curricular plan. During the last two-thirds of the semester, Washington University students will be on-site during the Compton-Drew school day, once a week on each Monday from 12:00 to 1:30 p.m. to teach small group workshops for some of the sixth- and seventh-grade students. There will also be a one-hour class meeting on Wednesday at a time to be finalized later. CET (https://gephardtinstitute.wustl.edu/for-faculty-and-staff/community-engaged-teaching/) course.
Credit 3 units. Art: CPSC

A46 ARCH 355 Interdisciplinary Ecosystems Principles Integration
The mission of this interdisciplinary seminar class is to "advance interrelationships of ecological and human systems toward creating healthy, resilient, and biodiverse urban environments" and will bring together experts and students in ecology, urban design, architecture/landscape architecture, economics, social work, and engineering, drawing from inside and outside the Washington University community.
Credit 1 unit. Art: CPSC

A46 ARCH 355A Carbon Neutrality in Architectural Design
Team WashU aims to create a solar home to educate the public on a state-of-the-art, carbon-neutral, adaptive healing space for occupational therapy services using innovative interior, architectural, and system design to meet the users' physical, social, and emotional challenges. The study will focus on design, materials, and renewable energy by illuminating the role of carbon in the built environment, and it will help students understand the principles and application of carbon assessment methods and Life Cycle Analytical (LCA) tools. Students will integrate carbon-neutral design principles into design, fabrication, and construction processes, testing the limits of conventional sustainable design practices and developing new strategies for designing carbon-neutral buildings. Students will work individually to create preliminary design schematics (and their associated structural morphologies, enclosure systems, and MEP systems). They will be fused around a single design strategy developed as a group design project, analyzed for its environmental impact and carbon footprint, and finally built by the student team. The course encourages students to participate in the fabrication and construction process developed as collaborative research, design, and construction effort and support professional consultants or manufacturing partners.
Credit 3 units. Art: CPSC

A46 ARCH 362A Materials of Memory: Designing a Pavilion for Peace Park

In Wounded Cities (2012), Karen E. Till writes, "Artistic interventions advance the difficult 'work' of memory in wounded cities marked by particularly violent and difficult pasts. Such projects also may offer possibilities of place-based mourning and care work across generations that build self-worth, collective security, and social capacity." In this course, architecture students will work alongside art students enrolled in a parallel seminar to develop integrated designs for an open air pavilion, a bus shelter, and educational signage for North St. Louis's Peace Park. This seminar is the current phase of an ongoing collaborative between Washington University and the College Hill Community to find tangible actions that can address past injustices, respect memories of the neighborhood, begin a process of healing in the present, and build infrastructure for the future. Students will conduct "memory work" by collecting narratives from local residents, exploring the recent and distant history of the site, and examining past placemaking projects that have successfully utilized memory work to create healing spaces. This foundational work will be used as the basis for the design and construction of large operational presentation models to be placed on display for the local residents. This collaborative process will continue after this semester and will result in a built project by the end of the summer of 2023.
Credit 3 units.

A46 ARCH 375C Patterns: Architecture and Machine Learning

Machine learning engages graphic information differently than designers do. All fidelity towards visual, cultural, political, and geometrical context/agenda is lost, resulting in a new class of compositions that are unique but not critical. This seminar serves as an introduction to the possibilities that machine learning can bring to a design workflow. The systems, primarily Generative Adversarial Networks (GANs) and Convolutional Neural Networks (CNNs), are explored with input images and analyzed as output images. These outputs, while biased by the Designer's inputs, lack any affinity towards meaning or aesthetic. The designer's role extends to that of a critic who identifies the output images that add value to the designer's intent or exposes them to new spatial relationships while also learning to dismiss the inherent tropes of machine learning. The works of contemporary artists and architects, like Matias Del Campo, Gabriel Esquivel, Helena Sarin, Refik Anadol, etc. who work with Machine Learning technologies, will be analyzed to understand approaches toward AI and Design. The course will use patterns, textures, and their dialog with architectural form to understand the 'patterns' of machine learning and extrapolate useful information from a seemingly endless sea of data. We will explore multiple AI processing tools like Google Colab (no prior coding experience required!), and RunwayML and delve into transposing/spatializing these images onto architectural elements using 3D scanning softwares like Trnio and Metashape and 3D modeling softwares like Rhinoceros, Z-Brush, Blender. The final deliverable would be a digital series of estranged architectural objects. We shall rigorously speculate on the desired outcome of the Machine Learning defamiliarization process and its role in transforming these 'found objects' into 'objects in-flux'; not unlike the technology that makes it possible. Here, the physicality of architecture is merely a starting point in unraveling a unique generative system of design ideas.
Credit 3 units.

A46 ARCH 376 Design Thinking for Science, Engineering, Business and the Liberal Arts

This introductory course outlines strategies and methodologies drawn from a wide range of creative design practices, including architecture, landscape architecture, urban design, industrial design and others. The course explores how these ideas and techniques are similar to practices in science, engineering, business and the liberal arts and how they might be applicable to multidisciplinary problem solving. Topics include perception, representation, technology, group intelligence, bio-mimicry and context-based learning, among others. Emphasis is given to the intersection of design thinking with environmental problems and the relationship between design thinking and innovation. The course includes lectures, guest lectures with case studies, and design projects. Open to all undergraduate students.
Credit 1 unit. EN: H

A46 ARCH 3823 15th- & 16th-Century Florence, Rome & Venice: Rethinking Renaissance Visual Culture

The Early Renaissance — also known as the quattrocento — usually denotes the period from circa 1400 to circa 1500. In those 100 years, Italy, particularly Florence, witnessed an extraordinary coming together of artistic talent, a passionate interest in the art and culture of Greek and Roman antiquity, a fierce sense of civic pride and an optimistic belief in the classical concept of "Man as the measure of all things." This course examines the principal artists who contributed to this cultural revolution. In order to take full advantage of the special experience of studying the renaissance in the very city of its birth, the stress is mainly, although not exclusively, on Florentine artists who include sculptors such as Donatello, Verrocchio, and Michelangelo; painters such as Giotto, Masaccio, Uccello, Botticelli, Leonardo, and Raphael; and architects such as Brunelleschi and Alberti up to Sangalo.
Same as F20 ART 3823
Credit 3 units. Arch: HT, RW Art: AH

A46 ARCH 3824 The Italian Renaissance in the City of Florence

This course encompasses the Renaissance from Giotto through the High Renaissance. Students examine first-hand the works they are studying. Included are field trips to Rome and Venice.
Same as F20 ART 3824
Credit 3 units. Art: AH EN: H

A46 ARCH 3825 Florence as a Cultural Artifact: The History of Architecture as the History of the City

This course combines seminar and workshop activities aiming at the understanding of the rich urban and architectural history of Florence, the place of students' work and temporary living during the study abroad program. These activities will be in dialogue with the design studio and art history courses. The intellectual framework of the course is informed by Giulo Carlo Argan's seminal work "La storia dell'arte come storia della città" ("The history of art as the history of the city," Einaudi, 1983), presenting the city as a complex time-space phenomenology of cultural artifacts. While Florence is well known for its cultural contribution to Western cultural history during the 1400s and 1500s, little is known about the full span of its millennial history, including its contemporary developments. The seminar activities will cover such aspects through readings and lecture-cum-sketching urban and architectural documentation tours in the first part of the semester, leading to the development of individual artists' book projects to be completed in the second part of the semester for the program's semester exhibition.
Credit 3 units.

A46 ARCH 3827 The Space Within: Interior Experience as the Origin of Architecture (Florence)

An undergraduate seminar structured around the themes put forward in the book, The Space Within: Interior Experience as the Origin of Architecture, by Robert McCarter. Throughout human history, and particularly in the modern period, interior space and its experience has served as both the beginning, the initial inspiration for the design of architecture, as well as the end, the final purpose of architecture as it is evaluated through inhabitation. Since the beginning of the modern period, and continuing today, pivotal discoveries in architectural design may be traced back to a generative ideal of intimate interior experience, and the quality of the interior spatial experience of the

inhabitants may be shown to be both the primary determinant of the architectural design process, as well as the means of appropriately evaluating a work of architecture after it is built. This seminar explores how interior space has been integral to the development of modern architecture, and how generations of modern architects have engaged interior space and its experience in their design processes, enabling them to fundamentally transform the traditional methods and goals of architectural composition. For the leading modern architects and for the most recognized and respected architects practicing today, the conception of the interior spatial experience continues to be the necessary starting point for design, and the inhabitation of interior space remains the primary reason to construct works of architecture. Each class will consist of both faculty lectures based on the chapters of the textbook, The Space Within, and, parallel with the textbook themes, student analyses of selected interior spaces in Florence and Venice, to be visited during the first half of the fall semester. Analytical methods employed in the course cover the full range of contextual, cultural, material, constructive, and experiential attributes of buildings, with particular emphasis on the manner in which the spaces of a building are ordered by the patterns of occupation and the poetics of use, as well as the poetics of construction, or the way in which a building is built, and of what materials it is made, and how all these combine to construct the experience of those who inhabit it.
Credit 1.5 units.

A46 ARCH 382S Special Topics: Through Thick and Thin, Light and Shadow (Florence)

This seminar will introduce students to shared relationships between painting, sculpture and architecture - relationships and affinities related to light, shadow and the openings in buildings. An emphasis will be placed on the phenomena of natural light and shadow - its depiction through representation [drawings, paintings and photography] and its qualification [architecture]. Most examples will be visited, experienced, represented and analyzed by the students "in the field" - churches, chapels, monasteries, museums, etc. + paintings, frescoes, and sculptures. Many of the architectural spaces will be visited multiple times to both experience and depict varying phenomena of light and shadow. In addition to the site visits, students will be introduced to various aspects of light and shadow in Italian art and architecture through lectures and readings.
Credit 1.5 units.

A46 ARCH 385B Beyond Words, Beyond Images: Representation After History

The seminar focuses on art in the public domain and examines contemporary practices that engage public memory and the metacity. Prompting students to consider their own practice in the context of public space, this seminar offers examples of projects that contribute to the global cultural and political discourse. Weekly illustrated lectures, readings, writing assignments, screenings, discussions, and individual research lead toward the final term paper. Individual studio consultations serve as a platform for the discussion of student's evolving practice, which culminates in a final project in a medium of choice. MFA VA students and graduate students in architecture are especially welcome.
Credit 3 units.

A46 ARCH 388A Architecture Portfolio Design

Architecture portfolios play an essential role in framing and presenting work in both academic and professional contexts. More importantly, through the reflective act of re-presenting images and texts, students can begin to define their positions in the field and direct the course of their careers as architects. Architecture Portfolio Design facilitates the production and development of a comprehensive portfolio and covers the essential concepts and techniques at play in contemporary portfolio production. Over the course of 8-weeks, we will do the

following: 1) perform close analyses of groundbreaking architectural publication designs; 2) assemble, organize, and evaluate portfolio image and text content; 3) profile the key academic institutions and employers with which students are most interested in engaging; 4) define the target audience to better frame content for that audience; 5) review portfolio organization as well as page layout and hierarchy of image and text; 6) perform an intensive review of student written project descriptions and related captions; 7) review tactics of digital display and physical distribution; 8) invite widely published architects and graphic designers in the Sam Fox School to portfolio reviews; 9) invite a panel of students that have prepared successful portfolios to present and share strategies; and 10) tangentially address curriculum vitae, work samples, web and social media accounts, reference letter requests, essays, and letters of intent.
Credit 1.5 units.

A46 ARCH 396B Making Things That Function

Heidegger identified "things" as what objects become once they cease to perform their function in society. In this course, we seize that moment of dysfunction as a point for creative intervention. Students will design and make functional objects that engage the body with intention. The meaning of function will be debated so that students develop a definition based on their own values. Highly exaggerated, specific, or experimental works will be encouraged. Techniques for metal fabrication, simple woodworking, and mold-making will be taught in class, as needed. No previous experience is necessary. This course will benefit designers, artists, architects, and engineers, and it will explore the intersections of design and making among these fields. Prerequisite: 3D Design, Architecture 111 studio, or permission of instructor.
Same as F20 ART 396B
Credit 3 units. Art: FAAM, FADM

A46 ARCH 400A Design Foundations Studio

This is an intensive three-week program that introduces incoming students to the pedagogy around thinking and making through an introductory studio exercise. Enrollment is open to first-semester MArch 2 students only.
Credit 3 units.

A46 ARCH 401B Color in Architecture, Design and Art

This seminar introduces students to aspects of color in architecture, design and art and deals primarily with 19th-, 20th- and 21st-century theories and projects. Student work includes readings and discussions, case studies and experiments in color application. Research includes case study architectural examples by Rietveld, Herzog & De Meuron, Luis Barragan, SANAA and others; readings on color theory by architects Alberti, Fernard Leger, Koolhaas, Le Corbusier; artists Mondrian, Josef Albers, Richard Paul Lohse, Ad Reinhardt, Barnett Newman, Donald Judd; philosophers Goethe, Wittgenstein, Barthes; psychologists Carl Jung; and designers Irma Boom, Ettore Sottsass, Bruno Munari and Konstantin Grcic. Resources will include the collections of the Mildred Lane Kemper Art Museum and the Saint Louis Art Museum.
Credit 3 units.

A46 ARCH 402A Measured Representation

This course proposes to investigate and create a series of measured drawings. The drawings, as architectural objects, configure architectural knowledge, perception and vision. We will begin by studying precedent drawings in relation to each architect's theoretical framework, project description and technique. The range of works will relate different types of construction (perspectives, axonometrics, diagrams, ideagrams, assemblages, montages, descriptive geometry, and mapping) with integral and symbiotic theoretical agendas. Each student will learn the techniques of representation in their case study and from this example construct an interpretation of a specified site in this language.

With a collection of theoretical frameworks and workshops on various techniques, the class will qualify a series of sites through drawing/interpreting the shadows present. Shadows may be thought of as reductions of the real object — in this sense, the drawings will act as abstractions or reductions that promote vision. Instead of simply discussing qualities of space, narratives of metaphor, intangible phenomena, implications of constructed geometry, this architectural research project attempts to propose methods of seeing such that the representation may play a more active role in the shaping of design. This course centers on the creation of imaginative processes of representation.
Credit 3 units.

A46 ARCH 404 Advancing Integrated Sustainability
Do you want to work differently? Toward more effective outcomes? This course is a call to students from all disciplines with the conviction that it is necessary for us to work together while contributing from our specific fields of study to find solutions to challenges in our built environment. Students apply the knowledge base they acquire in this course to formulating ideas for actual community projects in St. Louis. Students learn to integrate and apply a holistic range of social, economic and technical systems inspired and optimized by models in the natural world. A foundation in natural and biomimetic systems is overlaid with analysis of corporate mission, principles and triple bottom-line thinking in order to learn how to build defensible, value-based arguments for implementation of sustainable systems. With the expressed intent of achieving net positive outcomes in the built environment, the following topics are addressed: brownfield property reuse; storm/wastewater management; urban heat island management; air quality; potable water issues and opportunities; material cycles and flows including embedded energy, emissions, toxicity, virgin vs. recycled content and waste diversion; energy efficiency and renewable energy opportunities; transportation, accessibility and mobility choices; vernacular and cultural expression; local and healthy food availability; fitness advocacy and other health issues; education; public outreach and transparency; governance; and the economics of these systems. Lectures, case studies, readings and class discussions support application exercises and experimental projects to propose ideas for improving the built environment at multiple scales. Assignments are reviewed often to assist each student's learning and questions. Complementing leading-edge theory with practical outcomes are provided with the intention that students develop valuable skills to be incorporated in their other academic projects. Please visit http://samfoxschool.wustl.edu for work samples and student manifestos from previous classes.
Credit 3 units.

A46 ARCH 404C Topics in Architectural Entrepreneurship
Entrepreneurship has become a very important issue for businesses small and large. What can the profession of architecture learn from these ideas? This course, offered in partnership with the Skandalaris Center for Entrepreneurial Studies, offers students a chance to gain exposure to the entrepreneurial ideas that are innovating the architectural community, and begin to foster a mindset of architectural entrepreneurship that has the potential to be widely beneficial to the profession. Each week the course welcomes a guest speaker who, as the owner of a firm or innovator of a new business proposal in the design field, provides case studies to show students what type of entrepreneurial ideas are shifting the architectural discipline. From sustainability, to urbanization and localism, to emerging global growth engines, and the future structure of the architectural network, each lecturer brings new insight to what it is to be an architectural entrepreneur.
Credit 3 units.

A46 ARCH 404D For Purpose: Art & Design as an Ethics-Based Model of Entrepreneurship
Working from the premise that art and design have the ability to enrich and transform lives and communities in a tangible way, students redefine social, environmental and cultural problems as opportunities. Students are encouraged to bring ideas that have the potential to address these problems through the creative processes of art and design. Students work in teams to develop a proposal for a project, product, or service-based organization with the potential to address a specific issue. Students draw lessons from researching established individuals, companies and not-for-profit organizations that are involved in the production of culturally significant, creative work that also supports a larger social mission, and students apply this research to their own proposal. Each proposal is developed into a business/sustainability plan that demonstrates the value of the proposal and explains the resources required to meet specific goals. This course introduces students to the uncertainty that is inherent in the entrepreneurial process. Students work to develop skills to evaluate ideas in relation to their personal values, the idea's ability to address a specific problem, and the resources required to implement a sustainable solution. The process helps students to navigate the uncertainty and assess the risk associated with implementing their proposal through morphing the idea concept, seeking advice, and building a coalition of stakeholders. This course is open to disciplines outside of architecture. Students in Art, Social Work and Engineering are encouraged to register.
Credit 3 units.

A46 ARCH 404E Design: Urban Ecosystem Principles Integration
In today's world, our discipline has grand challenges whose solutions often lay in other realms. How will students train themselves to leverage the interdisciplinary partnerships required to innovatively solve and evolve in a rapidly changing world? The mission of this interdisciplinary course is to "advance the interrelationships of ecological and human systems toward creating a healthy, resilient, and biodiverse urban environment" and brings together experts and students in ecology, urban design, architecture/landscape architecture, economics, social work and engineering, drawing from inside and outside the Washington University community. Building from our knowledge of ecosystem principles and function, a diverse group of leaders in their fields provides lectures, readings, and student project leadership to understand and test Healthy Urban Ecosystems Principles among human and ecological (nonhuman) systems and the range of sociopolitical processes entailed with their implementation. Class content is developed by Washington University leaders in their disciplines as well as external organizations such as the Missouri Botanical Garden, the Field Museum in Chicago, and others. This course builds upon a 1-unit fall seminar (not a prerequisite) that introduces challenges and solutions to achieving healthy urban ecosystems, and provides students an opportunity to more deeply engage and manipulate the interrelationships of symbiotic urban systems and apply those concepts in multidisciplinary project applications. Projects leverage student-defined challenges in the evolving laboratory of urban St. Louis using Healthy Urban Ecosystems Principles to develop multidisciplinary integrated solutions to challenges encountered in urban areas such as climate change and resilience, security of ecosystem services, social inequity, economic strife, and community vitality. Students present their work in a public forum at semester's end. CET (https://gephardtinstitute.wustl.edu/for-faculty-and-staff/community-engaged-teaching/) course.
Same as I50 INTER D 406
Credit 3 units. A&S IQ: SSC Arch: SSP EN: S

A46 ARCH 405D Furniture Design
The course focuses on the design of tables using wood as the primary material in response to "rational and irrational strategies" (systematic and emotional). Each student designs, develops and builds prototypes of two tables using the same material. One table is the product of a systematic analysis of material qualities, production procedures and other constructivist principles. The other table is the product of more explicitly intuitive, emotional and interpretive responses to the nature of the material and its production. Course limited to 10 students.
Credit 3 units.

A46 ARCH 405H Sustainability Exchange: Community and University Practicums
The Sustainability Exchange engages interdisciplinary teams of students to tackle real-world energy, environmental, and sustainability problems through an experiential form of education. Students participate in projects with on- or off-campus clients developed with and guided by faculty advisors from across the University. Teams deliver to their clients an end-product that explores "wicked" problems requiring innovative methods and solutions. Past projects have included investigating soil impacts of de-icing practices on campus, collecting data on inequitable trash collection in neighborhoods, working with St. Louis City's building division to make buildings more energy efficient, developing an understanding of how buildings impact birds on campus, and analyzing the performance and viability of sustainable investments. Upcoming projects are still being finalized and may include mitigating plastic pollution in the Mississippi, creating and publishing an illustrated book on the social, cultural, and ecological importance of Forest Park, and assisting with the planning and development of a rain-scaping proposal for a St. Louis City neighborhood. Team-based projects are complemented by seminars that explore problem solving strategies and methodologies drawn from a wide range of creative practices, including design, engineering, and science, as well as contemporary topics in energy, environment, and sustainability. Students will draw on these topics to influence their projects. The course is designed primarily for undergraduates, with preference given to seniors.
Same as I50 INTER D 405
Credit 3 units. A&S IQ: SSC Arch: SSC Art: CPSC, SSC EN: S

A46 ARCH 407A Digital and Analog Fabrication
Digital and Analog Fabrication (Aperture Systems) explores contemporary fabrication methods for architectural design. We will develop and employ digital and manual fabrication techniques, including casting, thermoforming, 3D printing, laser-cutting, and CNC milling, for a semester-long design project. Students will have opportunities to work with a variety of tools in the shops and digital laboratories to develop a full-scale kinetic prototype of/for a door/window/portal/aperture system. No previous fabrication experience or expertise is required.
Credit 3 units.

A46 ARCH 407B Dynamic Materialism and Urbanism
Dynamic Materialism and Urbanism is a course developed for students who are interested in emerging technologies and digital production. The course develops and tests experimental design processes in architecture and digital media by enhancing 3D technologies, and it allows each student to adopt abstract thinking and making processes. This course develops digital design skills with the conceptual understanding of the transformative awareness of the artistic production of computational processes, which can inspire new forms of architectural conditions. The current developments in digital technology allow mathematical expressions to transform complex generative systems, which have shifted the formal discourse of architecture. The new digitally based techniques are being invented to inform creative processes in architecture through the manipulations

of complex geometrical and topological forms. This course will focus on developing new techniques that translate these mathematical developments into diagrammatic design strategies. The generative modeling techniques will be deployed by the students for this investigation. Students will develop a complex set of massing strategies with conceptual development for defining and inventing dynamic-based architectural proposals within an urban context. Through digital modeling and mutating architectural strategies, each student will develop a transformational condition of a new emerging design. The new architectural forms are to be modeled through CAD/CAM (laser cutting) and rapid prototyping (3D printing) for physical outputs.
Credit 3 units.

A46 ARCH 408J Performance Enhancing
The term "performance" has many meanings that are either quantitative, qualitative, or both simultaneously through a range of design professions. The suggested goal of performance is an optimistic enhancement to a designed entity or idea and holds the potential to be highly provocative relative to the method it is deployed when arguing for a particular design procedure or effect. The double entendre suggested by the term performance relates to both how the system technologically improves a functional aspect along with a more theatrical act of performing. Design in both architecture and fashion relies on both interpretations to create a multidimensional discourse necessary to advance conceptual design investigation. The seminar class explores issues of performance of complex surfaces at the scale of the human body. The class consists of lectures, discussions, readings, physical material manipulation, and 3D digital modeling and digital fabrication. The use of Rhino (with T-splines and/or Grasshopper) or Maya is deployed for the digital design of the skin systems. Material systems are explored initially through manual experimentation and then combined with the digital investigation for the final digital fabrication using tools such as 3D printing, lasercutting, CNC milling, and thermoforming, resulting in a final garment for the human body. The class is offered to both fashion and architecture students and the investigations occur in teams of two where ideally one from each discipline is represented.
Credit 3 units.

A46 ARCH 408M Atmospheric Animations
This course explores the capacity of modifying perception, as a way of thinking and making in design process. We recognize the ambient complex environment base on the concept of each element in space as a figure of motion, being sensitive to a specific period of time. Each student begins with selecting a certain way of observing, and developing a method to document and analyze a piece of dynamic perception which is then re-constructed through drawings or models, primarily focusing on one aspect of the experience, such as material performance, light reflections, air flow, etc. Final part of the project is representing the synthetic perception, by creating the atmospheric imagery in motion. Students are introduced to various techniques of recording ocular perceptions with the aid of digital tools, 2D representation, 3D modeling and animation rendering throughout the course, both as general workshops and individual project basis.
Credit 3 units.

A46 ARCH 408N Mapping Complex Spatial Sequences
New methods of spatial practice have changed the way architects and designers work. As designers, we are no longer tied to static, projection-based drawings as a means to develop and represent our ideas. Time-based digital imaging allows us to simultaneously examine the narrative, formal, experiential and spatial aspects of a particular place. Students will map a site through digital photography focusing on a specific spatial sequence much like how a director would set up a scene, moving fluidly from one space to another. During the first half of the semester, this spatial sequence will be used to create a drawing of the entire site as one multilayered composite image with particular

attention to the interaction of time, space and movement. The site will then be reconstructed digitally through models or drawings, using the composite drawing as base. Finally, relationships between the drawing and model will be outlined resulting in a more complete experiential spatial sequence.
Credit 3 units.

A46 ARCH 408P Building Performance for a Solar Powered House

We will study the state of the art of building integrated solar systems, and design such a system for a house and assess its performance using computational tools. Topics include the fundamentals of solar energy systems, energy management, and its implications to design, either passive or active approach. The course involves building performance simulations using Ecotect, Energy+, HERS and other tools. Students will use simulation data to study the relation between design and its performance. The course will consist of lectures, review, and student projects. The course will be parallel with several Engineering courses, including ESE 437: Sustainable Energy Systems, and EECE 428: Sustainability Exchange. Projects will involve teamwork with Engineering students of different backgrounds. The course will contribute to Team WUSTL solar decathlon with the following features: energy efficiency: passive design; high performance enclosure; net-zero energy: renewable energy; heat recovery; sustainability: water recycle; carbon neutral; lean construction; resilience: prefabricated house to mitigate natural disasters; Smartness: advanced sensors network; energy management; data visualization; human-centered living adaptability: flexible space; human comfort and perception controls to operate the house to improve productivity and health; an interdisciplinary effort for renewable energy and sustainable buildings.
Credit 3 units.

A46 ARCH 408Q Fabricated Drawings

The course will focus on digital fabrication tools, techniques and image theory to uncover new methods of producing physical images. Images are built in a myriad of methods including physical media or from data. Physical images, as defined in the context of this seminar, will transcend a 2D limitation to develop thickness. The increase to 2.5D or 3D opens opportunities to investigate the use of digital fabrication tools to construct images. In particular, the class will focus on the way information technology continues to have a profound effect on the way we perceive our built environment and the way we represent it. The images that surround us are becoming increasingly easy to generate through information technology. Access to technology both in terms of digital design and output affords the opportunity to reconceive the nature of images. Images are developed through analog, digital or hybrid processes. Their generation is a collaborative interaction between intuition and information processes through clearly defined rules. The scientific theoretician, Peter Galison, discusses the tension between intuition and information on the nature of images in the arts and sciences. Images reveal the intricacy of relations and knowledge, but they are simultaneous deceptive because they bypass the mathematics of pure science. The tension in the arts tends to be between the intuitive, interpretive ability of images as representation versus the image as evidence of a computation-based process. Architectural theoretician Mark Linder talks about how images in architecture are moving away from representations of something else toward a more literal and non-idealized result of a procedure. The image is literally the process of making visible the end result of an operation. Therefore, images are the evidence of the process by which they were generated. As such, the class will develop innovative processes for our digital fabrication equipment to construct images. The projects will develop new methods to use the CNC mill, laser cutters, knife plotter and 3D printer. New tools may need to be developed and built to enable the image fabrication process. In parallel with technological development is material experimentation. Students will be highly encouraged to test new materials to program their behavior and interaction with technology.

Credit 3 units.

A46 ARCH 408R Intelligent Prefabrication

Digital Fabrication is often critiqued as not being scalable to larger projects since it is often associated with highly specialized small prototyping and installations. The seminar will focus on digital fabrication at the medium to large scale using a proprietary system designed by Scott Mitchell, alumni of Wash U and founder of Stud.io. The system focuses on intelligent prefabrication using custom parametric software to create a series of robotically fabricated metal studs that can be easily assembled into almost any form. The CNC machine is specifically designed to make these custom metal studs with a series of operations, promoting mass-customization. The seminar will develop full-scale prototypes.
Credit 3 units.

A46 ARCH 409C Watercolor Painting for Architects, Urban Designers and Landscape Architects

This class will introduce students to different techniques of watercolor painting. The class will focus on teaching students the basics of material selection (paint colors, brushes, various papers), proper paint blending/mixing techniques, creation of unique color palettes, and both smooth wash techniques and painterly brush effects. Students will learn to render site plans of their own project work. There will also be an optional afternoon of pure sketching with paint. One objective is to teach students the methods to create beautiful renderings so that they may chose to apply the techniques to their final studio illustrative work (at the discretion of the student). Grades will be based upon class participation, effort, and final watercolors. Fulfills Analog elective requirement.
Credit 3 units.

A46 ARCH 409E Architectural Sketching

An introduction to architectural sketching — a graphic communication skill that architects and designers use to analyze and document their environments, and to visualize design thinking and creative process. Many class sessions will meet on site, drawing directly from observation. The first part of the semester will focus on fundamentals of sketching through the study of existing buildings, their contexts, and interiors. Students will expand and refine their observation skills as they use the architectural sketch as a mode of research — exploring elements of architecture: form, material, light; and the relationships between building and context, and building and interior. The second part of the semester will expand to include the architectural sketch as language. Students will learn to use the architectural sketch to explore, confront, develop, and translate abstract ideas into visual narrative, creating a record of design thinking and creative process. Students will be registered for the course from the waitlist by the Registrar's Office. Priority will be given to undergraduate students. Prerequisite: Drawing I or graduate architecture standing.
Credit 3 units.

A46 ARCH 4102 Lively City: Behavioral Studies & Public Space Design

Working in small groups, students will acquire new perspectives and skills that put people and their needs at the heart of the creative process of re-imagining and transforming cities. Livability, lively cities, public life, and other concepts describing inviting, vibrant, and stimulating urban environments are frequently communicated in new visions for the future of cities today, but they are the most often unrealized components of design projects. This focus on "urban life" is a direct reaction to the urban realities created in the 20th century, where increases in our standards of living and the associated city building processes have created areas in which large and increasing numbers of people have become isolated from each other, both socially and geographically. Despite our new awareness for the need

to plan for a shared and intensified urban life in sustainable cities, we continue to have difficulty understanding exactly what this "urban life" is, how much of it we truly want and need, and how we can reconcile the often conflicting and simultaneous needs of people for privacy and social stimulation. Open to all graduate students. Master of Urban Design students receive priority. The completion of both the Informal Cities (fall semester) and Lively City (spring semester) masterclasses may fulfill the Urban Issues elective requirement for MArch students. Same as A49 MUD 4102
Credit 2 units.

A46 ARCH 411B Architectural Design V

The third and fourth years introduce a selection of option studios to students. This year emphasizes voice as students adopt their own conceptual position through the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on advanced architectural design and an in-depth study of a specific topic through rigorous design development. Prerequisites: Successful completion of A46 111C or A46 144, 112C, 211D, 212D, 311B, and 312B with a grade of C- or better.
Credit 6 units.

A46 ARCH 411F Architectural Design V (Florence)

The third and fourth years introduce a selection of option studios to students. This year emphasizes voice as students adopt their own conceptual position through the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on advanced architectural design and an in-depth study of a specific topic through rigorous design development. Prerequisites: Successful completion of A46 111C or A46 144, 112C, 211D, 212D, 311B, and 312B with a grade of C- or better. Note: Only students in the Florence study abroad program may register for this course. Students will add themselves to the wait list and be administratively enrolled.
Credit 6 units.

A46 ARCH 412B Architectural Design VI

The third and fourth years introduce a selection of option studios to students. This year emphasizes voice as students adopt their own conceptual position through the iterative development of form, geometry, space, and aesthetics. More specifically, this studio focuses on advanced architectural design and an in-depth study of a specific topic through rigorous design development. Prerequisites: Successful completion of Arch 111B or Arch 144, 112B, 211C, 212C, 311, 312, and 411 with a grade of C- or better.
Credit 6 units.

A46 ARCH 414A Digital Ceramics

The production of ceramic building materials spans from individually constructed and handcrafted to industrial and mass produced. Some of the earliest examples of permanent structures include clay-based building components. At the turn of the century, the Hydraulic Press Brick Company in St. Louis was the most innovative brick company in world, producing 100 million bricks per year by 1900. The abundance of clay and the affordability of bricks contributed to the longevity of building stock, where even modest homes had ornamental bricks, corbeling, recesses, and extensions. Historically, fired clay building components were valued for their strength, modularity, fire resistance, raw material availability, and aesthetics. Ceramic building units are pervasive in their use in the built environment, but they have been underappreciated in contemporary architecture practice. Digital Ceramics examines new possibilities for masonry and ceramics in architecture through computational design and digital fabrication. Algorithmic design techniques, digital fabrication, and ceramic research will be merged for the design and production of nonstandard ceramic components in aggregated assemblies. Readings, tutorials, and guest lectures throughout the course will focus on innovations in digital

technology, digital fabrication, advanced geometry, and material practices. Student work will include the creation of 3D-printed and/or CNC-produced molds and slip-cast ceramic components. Additional course work will include drying and firing clay components, staining and glazing techniques, and clay body research. Students will also be introduced to ceramic 3D printing during the course. Digital Ceramics confronts the seemingly disparate modes of physical making and digital form-giving with the introduction of a new material system that expands the aesthetic and performative potential of aggregated enclosure assemblies. In recent digital discourse, we have seen the ability for endless variation and customization through the use of parametric design software. This course intends to underscore a thoughtful consideration of the relationship between technology and adaptability. Through material behavior and calibrated irregularities, we have the capacity to make each component unique. Experience with digital modeling (Rhino) and digital fabrication is strongly encouraged.
Credit 3 units.

A46 ARCH 418A Design Culture

This course will provide an overview of historical and contemporary design issues, including (but not limited to) graphic design, communication design, industrial design, furniture design, film, and animation. Lectures, films, and readings will deepen students' knowledge of how different design practices complement and enrich architecture and broaden their understanding of how history, philosophy, and technology have shaped different design movements.
Credit 1.5 units.

A46 ARCH 419 Architectural Design III (MArch 3)

The third of a three-semester sequence of design studios. Continues examination of issues raised in ARCH 317 and ARCH 318.
Credit 6 units.

A46 ARCH 420E The Persistence of the Beaux Arts

This seminar will investigate the neoclassical style associated with the École des Beaux Arts in Paris (est. 1819), which was characterized by symmetry, grid-based plans, privileging of the plan in design, the systematic organization of rooms, urban monuments, relief sculpture, statues on buildings, and other attributes. We will compile a database of projects; explore the nearby traces of the Louisiana Purchase Exposition of 1904 in Forest Park and on the Danforth Campus; and use resources in the Steedman Collection in the St. Louis Central Library and the Missouri Historical Society as well as on campus. An optional longer-distance field trip will be considered. Association of the Beaux Arts style with utopian societies, nationalist politics, colonial expansion, and enslavement practices as well as with science, health and hygiene, and international relations will be examined. Taking the analytical research of Colin Rowe and Kenneth Frampton as models, students will enrich their understanding of Beaux Arts architecture through comparative analyses, seeking connections between its buildings and examples from Ancient Egypt, Classical Greece, and the Renaissance as well as from the modern, postmodern, and contemporary periods. Final projects may use drawing, rendering, photogrammetry, or video, along with a written research paper. Prerequisite: Architectural History II. A few spaces will be reserved for undergraduate students.
Credit 3 units. Arch: GARW, RW

A46 ARCH 421Q Utopia or Oblivion

Taking its title from Buckminster Fuller, this seminar investigates whether architectural design could be a revolutionary practice, serving to transform social and spatial relations simultaneously. In this era of pandemics, climate change and social disparity, can architecture's history of utopian projects help us form practices to change the world around us? Can an imaginary of perfecting the world through built forms serve useful purposes today? The course will examine case studies of built and unbuilt designs that sought to transform social

and political structures, including speculative urban-scale designs by Ebenezer Howard, Frank Lloyd Wright, Le Corbusier, Tony Garnier, Mirra Alfassa, Paolo Soleri and others, as well as architectural projects envisioned by Fuller, Oscar Niemeyer, Minoru Yamasaki, Archigram, Kisho Kurakawa, Russian and Yugoslavian communist designers and others. Lectures will be coupled with field work at local sites enmeshed in concepts of utopia and dystopia, and students will develop their own speculative work presenting contemporary visions of utopian design. Credit 1.5 units.

A46 ARCH 421U Urbanism: Chicago

This design research seminar focuses on the urban infrastructure and associated buildings of central Chicago, in and around the areas near the Loop. The Chicago metropolitan area is the third largest in the United States, and from 1870 until the 1950s, Chicago was America's "second city," surpassed in size only by New York City. It remains the densest and most "urban" of the cities of the Midwest, with many examples of complex interconnections between rail lines, highways, and various kinds of pedestrian-oriented urban environments. This seminar combines historical and field research on some of the many architectural urban design interventions in Chicago. Students choose among several topic areas to produce detailed drawings and digital models of specific urban interventions. There will likely be a publication of the work. Topic areas for digital documentation include the pedestrian relationships between transit lines and various buildings and urban complexes, including the large Millennium Park interventions by SOM and others over the Illinois Central railway lines adjacent to Lake Michigan, and Wacker Drive, a 1920s underground limited access highway along the Chicago River, and other projects. Fulfills History/Theory and Urban Issues elective requirement. Credit 3 units.

A46 ARCH 421V Unbuilt Sert

This design research seminar will focus on the digital simulation of the unbuilt architectural design projects of Josep Lluís Sert (1901-83). This spring we will document and analyze Sert's drawings for St. Botolph's Chapel (1963) designed for the Boston Government Center complex with the goal of virtually "building" it. Sert practiced in Barcelona in the 1930s during the era of the Spanish Republic and later in the U.S. as both architect and planner. He was the President of CIAM (International Congresses of Modern Architecture) from 1947-56, and Dean of the Harvard Graduate School of Design from 1953-69 where he developed urban design as a discipline and academic program. The chapel was an effort to combine elements of Catalan modern architecture with his concept of a modern "New Monumentality" suitable to the postwar world. The seminar will also visit several of Sert's major built projects in the Boston area, and will include presentations by Dean Emeritus Edward Baum, who was job captain on the St. Botolph's chapel project with the Sert, Jackson firm. Students will work in teams to produce detailed digital models of the project to simulate the "built" chapel inside and out. Publication of the work is anticipated. Credit 3 units. Arch: GACS

A46 ARCH 421W Designing the Modern City

This course, which is based on the textbook Designing the Modern City: Urbanism Since 1850, is a lecture course that examines designers' efforts to shape modern cities. Topics covered include the technical and social changes in mid-19th century industrial cities, notably London, Paris, and Barcelona, as well as varied efforts to shape urban extensions and central new interventions elsewhere. These include reform housing efforts for the working class in 19th-century London and New York, Städtebau (city building) in German-speaking environments, the Garden City Movement, the American City Beautiful movement, "town planning" in Britain, and "urbanisme" in France (the source of the contemporary term "urbanism"). Less well-known topics that will also be addressed are urban modernization in East Asia before 1940 and suburban planning in the United States, including

Frank Lloyd Wright's Broadacre City. The book also addresses social change and modern urbanism in Europe in the 1920s, including the emergence of CIAM (International Congresses for Modern Architecture), which met from 1928 to 1956; the political, technological and urban transformations of World War II; the expansion of racially segregated decentralization in the United States; and some European and Latin American postwar urbanism. It also addresses urbanistic aspects of postwar architectural culture, including critiques of modernist planning by Jane Jacobs and others and more recent responses to the ongoing challenges posed by efforts to create organized self-build settlements and to make more ecologically sustainable cities. Credit 3 units. Arch: GAMUD, GARW, GAUI, RW, UI

A46 ARCH 421X Modern St. Louis, 1940 to 1974: Art, Architecture and Social Change

This seminar addresses the research question, "How did modern art and architecture become such a major aspect of St Louis's cultural life in the middle decades of the 20th century?" Offered in preparation for a fall 2022 exhibition on this topic at the Kemper Museum, the seminar will research this question, both by presenting notable works of modern architecture that were built here and by examining art collecting and philanthropy here during this time period, where new and more socially inclusive values then associated with modern art had a significant impact on changing both the political and artistic culture of this large metro region. Architectural works to be researched include the works of Harris Armstrong; Cloethiel Woodard Smith (a Washington University architecture alumna); Samuel Marx; Frederick Dunn; Eric Mendelsohn; Eero Saarinen; Dan Kiley; Joseph Murphy and Eugene Mackey, Jr; George Hellmuth, Minoru Yamasaki and Gyo Obata; and Charles E. Fleming. Prerequisites: Architectural History I & II or equivalent. Credit 3 units. Arch: GARW, RW

A46 ARCH 421Z The Chicago Skyscraper

This seminar will consider a set of projects by Burnham and Root, Holabird and Roche, Wm. Le Baron Jenney, Louis Sullivan, and others. A central example will be the Monadnock Building, with its two sections by Burnham and Root (1891) and Holabird and Roche (1893). As one of the main lines of inquiry, we will define the skyscraper type, evaluate examples through comparative study, and unfold "intersectional" aspects of the buildings with respect to race, gender, and labor. Special attention will be paid to symbolism and the relationship between structure, tectonics, and ornament programs. Circumstances permitting, the seminar will apply photogrammetric techniques to the documentation and study of architectural details, entailing a field trip. Space will be reserved for undergraduate students. Prerequisite: Architectural History I or II. Credit 3 units. Arch: GARW, RW

A46 ARCH 422H Urban Topographies

This digital seminar introduces students to the basics of geospatial modeling at both regional and local scales, with an emphasis on the creative application of GIS data toward design thinking, site analysis, and speculative urban design. The course explores the potential for GIS data as more than just for inventory and mapmaking, but also as an invaluable creative design tool. A series of digital workshops will touch on a range of cross-platform workflows, from digital cartography to parametric modeling to 3D animation. Tying this together will be a speculative urban landscape project that the students will model and visualize utilizing the software introduced. This year's iteration will lean more toward an experimental and explorative use of GIS for design, art and visualization. This course is intended to give students the flexibility to approach the syllabus as an independent study or as a supplement to their studio work. Software that will be covered includes ArcGIS, Autodesk Infraworks, 3DSMax and Grasshopper. Credit 3 units. Arch: ECOL

A46 ARCH 422J Confronting Urbanization: The Interactive Tissue of Urban Life

This course invites architecture and urban design students to explore the urban condition through the lenses of its interactive tissue -- a tissue that includes smartphones, the World Wide Web, credit cards, highway systems, airports, sidewalks, and indoor plumbing. Within this frame of reference, students are encouraged to investigate, unearth, and document with surgical precision the emergent interrelationships between actors, the agency through which actors engage with the interactive tissue, and the ways in which these actors and relationships shape and influence one another. With the understanding that ideas are generated through speculation, projection, and experimentation, we will use the third dimension as a point of departure toward the fourth dimension of time, and we will aspire to the fifth dimension of lived experience. It is most welcomed that students bring their curiosity to the course, that they are interested in being investigative, and that they are open to various mediums ranging from reading theories of urbanization, drawing, and experimenting with physical/interactive objects to using projection as a tool to document their research in both analog and digital formats. The final product of this course will be a presentation during which students will present their research through multiple media outlets, which may include drawings, installation work, or moving images.
Same as A49 MUD 422J

Credit 3 units. Arch: GAMUD, GAUI, UI Art: CPSC

A46 ARCH 423 History of Landscape Architecture

This seminar reviews the history of gardening in the Western tradition from the Renaissance to the present and in the Chinese and Japanese traditions. Park-making, neighborhood design, and the rise of landscape architecture as a profession receive attention, including several classes held at notable St. Louis examples. Course requirements include readings, a design or research project, and a final exam. Fulfills History/Theory elective.

Credit 3 units.

A46 ARCH 423E Cinematic Landscapes: The Making Of

Watch movies. Talk about movies. Analyze the making of movies. Make a movie. Climate-themed movies. Post-apocalyptic movies. Meet in technology. Learn to scientifically use drones. Learn to scientifically use LIDAR. Use these tools in your climate-themed movie. Sculpt stories in time, supported by sound. This course will focus on the analysis of landscapes and cities as portrayed by popular cinema. How eidetic portrayals of nature and cities are circulated by popular cinema. Stories through which the values, common referents, public concepts, and memes of a culture materialize through the construction of movies. Interior to the semester there is an interdisciplinary workshop. Four-day fieldwork with Geology Assistant Professor Alex Bradley. Map and produce digital representations at 2-cm resolution of a mountainside scoured by a burst reservoir. This class is divided into three parts: watch, learn, and make. Watch: Each week, students will be asked to watch one movie and one director's commentary, often referred to in the "bonus features" as "the making of." Learn: Students will study the methods and techniques used to create settings, props, and storyboards in the service of a sound vision. Make: Students will synthesize digital and analogue time-based media tools (sound and video) to make a movie thematically based on climate change.
Same as A48 LAND 423E

Credit 3 units.

A46 ARCH 424M Spatializing Extremes: Graphic Explorations on Projected Climate Futures

As architects, we communicate through a language of visual representation. We use drawing as an act of translation - to spatialize ideas and information in a way that could arguably be understood universally. Furthermore, we use drawing as an act of persuasion - to convince others of our designs, positions, and intentions. In the culture of immediacy that we currently find ourselves in - an era where the image and the video dominate our scrolling - it's more important than ever to produce compelling graphics that aid in the dissemination of information. This course explores how architects can harness the power of architectural representation to construct spatial narratives of text-based research and data, particularly regarding the interdisciplinary science surrounding projected climate futures. We will operate contextually through a lens that does not try to prevent the extremes of climate change, but rather accepts these new realities that we have already begun to find ourselves in, that of extreme weather events, floods, droughts, sea level rise, plant & animal migrations, and human migrations, among others. How can we translate existing climatic research into compelling graphics? How can we persuade an audience of the need to adapt our built environment and existing infrastructures in the face of these alternate realities? From there, how can we speculate on these conditions in a way that compels different thinking surrounding adaptation and resilience? The course will explore these questions through the generation of narrative drawings, working iteratively through a variety of digital drawing techniques towards a composition deeply layered with multiples sources of information as well speculations on climatic futures.
Same as A48 LAND 424M

Credit 3 units. Arch: ECOL

A46 ARCH 427H The Crystal Palace

The seminar will seek a thorough acquaintance with the Crystal Palace, the structure that housed the Great Exhibition of 1851 in London. We will follow a timeline from the building's origins in theories of art and society to its design and construction at Hyde Park, its opening, its exhibits, its wide publication in the media, its catastrophic fire, its reconstruction on a new site, and its final demise in 1936. We will examine the building's structure and details and the extent to which project and building served to plan parts of the city and inaugurated a new type of space for the public display of objects. Looking at authors of this project, including Joseph Paxton and Owen Jones, we will explore the implied relationships between architecture and landscape and between architecture and the decorative arts, including the unsteady beginnings of design for mass production. We will revisit debates this building provoked concerning the nature of ornament and the very definition of architecture. In reviewing the building and its contents, we will ask questions about antiquarianism and the return of the temple as a symbol; about natural histories, techniques of inventory, and the context of the British Empire; and about the role the Crystal Palace has played in narratives of the history of modern architecture. Readings will include selections from Paxton, Jones, Ruskin, Semper, Pevsner, Hegel, Benjamin, Tafuri, Said, Ranciere, and others.

Credit 3 units. Arch: GARW, RW

A46 ARCH 4280 Architectural History I: Antiquity to Baroque

This lecture course will introduce major historical narratives, themes, sites, and architects from ancient Greece to the end of the Baroque period. We will take an extended look at the dawn of the modern period during the 15th and 16th centuries through a global perspective, turning eastward from Renaissance Europe to the Ottoman, Mughal, Chinese, and Japanese empires. The great chronological and geographic span of this course will be pulled together around the themes of classicism and its subsequent reinterpretations as well as the pursuit of the tectonic ideal. Our aim is to recognize how these ideological pursuits of modern architecture evolved out of longer historical processes. We will also pay close attention to major sites of landscape and urban-scale work. Requirements will include a mid-term exam, a final exam, and a series of short papers.
Same as A46 ARCH 3280

Credit 3 units.

A46 ARCH 4284 Architectural History II: Architecture Since 1880

This course is an introductory survey of the history and theory of architecture and urbanism in the context of the rapidly changing technological and social circumstances of the last 120 years. In addition to tracing the usual history of modern architecture, this course also emphasizes understanding of the formal, philosophical, social, technical, and economic backgrounds of other important architectural directions in a global context. Topics range from architects' responses to new conditions in the rapidly developing cities of the later 19th century through early 20th-century theories of perception and social engagement to recent efforts to find new bases for architectural interventions in the contemporary metropolis.

Same as A46 ARCH 3284

Credit 3 units. Arch: HT

A46 ARCH 4288 Architectural History III: Advanced Theory

The third survey class focuses on architectural history and theory after modernism. It examines the rise of architectural theory as a field of inquiry and its links to both critical social theory — including the Frankfurt School — and to contemporary traits of philosophical postmodernity. From the contextual questions of meaning and memory to the examination of post-structuralism, cultural theory and identity politics — including race, gender and ethnicity — the course uses primary textual sources to illuminate drawings, buildings and ideas that defined this seminal moment in architectural history. While the course closely examines this time period of intense search for a new visual language, it also probes contemporary complexities of architecture's continued search for visual and social purpose in an increasingly interconnected world.

Credit 3 units. Arch: GARW, RW

A46 ARCH 428R Urban Archaeology

In this course, students will learn about the potential of making meaning from urban architectural artifacts - remnants of buildings still standing, artifacts recovered from demolition and archival sources that invoke lost designs. "Urban archaeology" can redirect destruction and loss of the built environment into meaningful knowledge. What can fragments and traces teach us about the material culture, politics and ideas of architecture? The main focus will be the collection of the National Building Arts Center, the nation's largest repository of architectural artifacts that is located in St. Louis. These artifacts - parts of demolished or extant buildings, drawings, catalogs and photographs -- come from St. Louis, Chicago, New York City and other places around the world. The course will provide an overview of architectural salvage, historic preservation and archive-making as architectural practices that are capable of producing meaning around loss and ruin. Students will work with artifacts through research, 3-D scanning, photographic documentation, drawing and interpretation. This course will help develop an exhibition of architectural artifacts at the Pulitzer Arts Foundation in Fall 2023.

Credit 1.5 units.

A46 ARCH 428U American Architecture and Urbanism

This seminar will focus on new ways of thinking about American architecture and urbanism in the 20th century. It is part of an effort to offer new conceptual frameworks to understand American architecture within its larger context of social, political, and urbanistic change. Unlike an architectural history survey course, it will not only focus on the canonical works of well-known designers such as Ludwig Mies van der Rohe and Louis Kahn, but it will also situate architecture within the various new social, spatial, technological, and legislative directions that have shaped American metropolitan areas since then. Students will present selected readings and pursue individual research projects for this course.

Credit 3 units. Arch: GARW, RW

A46 ARCH 430A Special Topics: Building Visits (Barcelona)

In this 3-credit seminar, students will experience first-hand a careful selection of exemplary contemporary architecture conceived through environmental and social considerations. The seminar is divided into two parts; the first is based on case-studies, and the second is a Spring break architecture travel. The first part consists of a series of lectures delivered by prominent guest practitioners on a single work (in or near Barcelona), followed by a visit with the architect to the building. Through on-site drawing analysis and other exercises, students will unfold the diverse design logics embedded in the building (urban, landscape, energy, material, tectonic and social) to grasp the work holistically. The Spring Break trip will similarly engage with exemplary built works and offices outside of Spain and within Europe. (The exact travel location will be determined according to regional covid restrictions at the time of travel.)

Credit 3 units.

A46 ARCH 430B Special Topics: Smart Residential Retrofit (Barcelona)

IAmid the debate on climate change and still immersed in the effects left by the global pandemic of covid19, cities have a key role in defining possible and accurate solutions. This seminar aims to familiarize students with urban concepts and themes, such as urban fabric, public space, buildability, scale, paths and streets, mixed-use, density, mobility flows, zoning, urban renewal, gentrification, etc., and provide them with basic tools to describe, analyze and articulate proposals in urban contexts. Through field visits, theoretical sessions, debates, and practical exercises, the spectrum of urban issues and themes will be examined with Barcelona as an example and a living laboratory.

Credit 3 units.

A46 ARCH 430M Special Topics in History & Theory: Hidden in Plain Sight: How to Read a Building

This seminar is an exploration of the importance of autonomy, formal analysis, and the rigorous use of architecture's unique language in the service of an idea, all unrelated to "style." The aim here is to demonstrate that, in the best of architecture — particularly in the Great (Canonical) Works — there is an "intention" that can be "read" in the buildings. These readings demonstrate a recurring methodology that can represent a rigorous, timeless, and comprehensive approach to understanding meaning in architecture from antiquity to the present. These intentions, which can be expressed as diagrams, are hidden in plain sight. They are not, in this context, diagrams of information that simply depict program, geometry, structure, circulation, and so on. The course will be comprised of lectures, reading assignments, in-class discussions, and drawing exercises. The lectures will introduce specific examples of the language of architecture. Using this language, students will analyze individual structures and compare buildings side by side. These comparisons will include buildings that come from different historical periods and that look nothing alike but that will be found to share the same basic diagram, as well as buildings that appear to resemble each other but that are fundamentally different. The goal is to learn to read buildings, to see in a deeper way, and to use that skill to analyze, refine, and correct one's own work.

Credit 3 units. Arch: GARW, RW

A46 ARCH 430N Special Topics in History & Theory: Learning From Pruitt-Igoe

This seminar examines the design and adaptation of ordinary inhabitation, taking as its starting point the Pruitt-Igoe housing project in St. Louis. Did this housing project succeed or fail as architecture? This question may have been asked for the wrong reasons. We will examine whether Pruitt-Igoe fulfilled the United States government's goal of creating modern, effective mass housing for working-class Americans. The path to an answer will examine the tangle of architectural modernism (and its critics), vernacular architecture, U.S. housing

policies, and ideological shifts within architecture itself. The seminar will investigate the career of architect Minoru Yamasaki, precedent tenement housing forms, and other social mass housing projects in the United States and Europe. Ultimately, students will complete research on whether or not it is possible to (re)claim Pruitt-Igoe as a successful architectural endeavor by understanding what housing forms it was intended to replace and what has come after.
Credit 3 units. Arch: GARW, RW

A46 ARCH 431A Architecture in the Age of Identity: Race, Gender, Ethnicity and Their Discontents

Identity is both an individual and social category. It is deeply personal, woven with memories, feelings and emotions, but also collective, informed by history, society and culture. Consequently, this gap between individual self-expression and societal conformity remains one of the fundamental tensions of human existence, but also a source of inspiration and imagination in our rapidly changing world. Categories such as race, gender, class and ethnicity-as well as their intersections and overlaps-remain dynamic. They constantly evolve, responding to the changing socio-economic context and engaging an ever-expanding array of cultural production-from literature and film to philosophy and sociology. This course expands the conversation even further, examining the relationship between design and identity in architecture, with a particular emphasis on architectural education. Covering a range of case studies that emerged after World War I, the course moves freely across various divides-between North-South and East-West, between socialism and capitalism-examining the representation of identity through a variety of architectural media, including drawings, texts and buildings. The course probes architecture schools and practices as both disciplinary enterprises and as hubs of identity formation, suggesting the capacity of equity and representation to serve as agents of both political and architectural emancipation. The course content includes lectures, discussions and presentations, as well as reading and research. The course is open to both undergraduate and graduate students and it has no pre-requisites.
Credit 1.5 units. Art: CPSC

A46 ARCH 431B Modern Architecture, Race, and Ethnicity

This course will review the issues mentioned in the title as represented in recent literature and historical examples, focusing mainly on the urban context but more on architecture than urbanism. Themes will include the history and theory of architecture; architecture as art and as service; architecture and social class; and technology and intersectionality. An emphasis will be placed on information literacy, including the use and management of primary and secondary sources, accessed digitally. Assignments will include a series of short papers and a final paper. Space will be reserved for undergraduates. Prerequisite: Architectural History II or equivalent.
Credit 3 units. Arch: GARW, RW Art: CPSC

A46 ARCH 434Y Precarious Structures: Composition/Anti-Composition

This design seminar will explore the construction of architectural compositions as time-based events using motion graphics, physics engines and scale models. Design exercises will be supplemented by readings and lectures that track intersections between abstract painting, color theory, choreography, video game physics, and architectural space. The suite of digital videos and models generated during the course of the workshop will make an argument for animation software as an architectural-form-generation technique. This workshop is designed as a visual-studies-focused exploration of material assemblages. In his recent text entitled "Bad New Days: Art, Criticism, Emergency," theorist Hal Foster analyzes contemporary visual artists like Thomas Hirschhorn and suggests the term "precarity" to describe one of the major emerging themes in post-2001 art; this is a meta-category that he puts forward alongside the abject, mimetic,

archival and postcritical. These terms, Foster suggests, might replace the postmodernist overprivileging of images and language. Following the work Foster highlights in his text, we will engage with what sculptor Robert Morris calls "anti-form": the material and optical territory of the formless (all that is horizontal, unconstructed, and otherwise base). It is without doubt that the specters of postminimalism -- Alice Aycock, Robert Morris, Eva Hesse and Mary Miss, for example -- loom large in contemporary aesthetic research. This pervasive (if underarticulated) interest in base materialism, elemental tectonics, and provisional structures owes much to the antiformal revisions of minimalism that these artists celebrate in their work (so many piles, ruins, stacks, stick-frame forts, huts, and shelters). Can architecture revitalize these types and add elements (spatial, economic, political and technological complexity) to the sculptural articulation of precarity? Can we design with formal provisionality at the forefront? Requirements: Beginners with no background in the following platforms are welcome. However, some familiarity with Rhino 3D, the Maya platform, and processing will be helpful.
Credit 3 units.

A46 ARCH 435E Furnish It, With Pieces

Public space is a key constituent that determines the character of a neighborhood and a city. It is embedded in the urban fabric and it can mediate the relationship between people and their particular surrounding landscape. Urban furniture and hardscape can play an important role in offering a wide range of uses for public spaces. The design of such pieces affects the way people live and experience a particular environment. The ultimate goal of this course is to design, fabricate and install a set of repeatable units to equip a vacant urban lot in order to offer opportunities for social interaction. The seminar focuses on the in-depth understanding and development of ideas based on the technical, experiential and aesthetic exploration of one material: concrete, into one specific application: urban furniture. This seminar builds up on the scope of the Creative Activity Research Grant awarded by the Sam Fox School of Design & Visual Arts where five porous concrete pavers were designed for a vacant plot in North St. Louis. The challenges are to adapt the given pavers to a new site condition and to propose new urban furniture made out of concrete. It involves the construction of pieces able to equip a gathering space as well as sidewalks that can offer local residents the opportunity to interact with others. This provides not only aesthetic appeal to the residents and visitors, but also allows the possibility of implementing an actual project in an abandon plot in Old North. We will enrich the community with a wide range of training opportunities as each step in the process of making the plaza is used for teaching purposes, from making pavers and other pieces, to salvaging, reusing or repurposing recycled material. Students are asked to design and build concrete urban furniture necessary for the gathering area. The pieces can encompass a wide range of uses: chairs and benches, tables, raised beds, planters, litter bins, modular fencing and mobility-related pieces such as bike racks, bollards and car stoppers. This is an opportunity for hands-on experience. These pieces have to consider the limitations of the material in terms of strength, weight, size, etc.; learning about the material itself as well as the act of construction, assemblage and mass production, which includes methods and technology, ranging from tools to molds. The formwork for the concrete pieces will be built through a process of CNC milling and rubber molds or vacuum formed plastic. The challenges are to define environmentally sensitive strategies for problem solving, conceptual development and poetic expression at both levels of the design process, conceptual and real. Sustainable principles such as the use of recycled materials as an aggregate in the concrete mix are an important consideration. Construction is the ultimate goal of this class. We work in collaboration with Anova, a local manufacturing company dedicated to the design and production of site furnishings. Anova provides some materials and brings their expertise to the project.
Credit 3 units.

A46 ARCH 435F Precast Concrete Enclosures

In contemporary construction practice, building enclosures are sophisticated assemblies conceived through complex processes that merge design, science, technology and craft. The outermost layer of the exterior wall is the most exposed to natural forces and therefore it needs careful attention as it must work effectively over the lifetime of the building. The primary goal of this fabrication seminar is the construction of full-scale mockup pieces that function as part of real building envelopes; this is an opportunity for hands-on experience. Students will design, develop and build enclosures out of different types of precast high-performance concrete assemblies as critical components of building envelopes. The course will be developed in partnership with Gate Precast, a leader company in the precast concrete industry. Supported by a grant from the PCI Foundation, students will have a budget of $12,500 to design and prototype precast mockups of building envelopes. Students will start by conducting research and analyzing historic and contemporary buildings, focusing on their skin properties and configurations. Then, they will proceed to identify specific environmental condition(s) and develop an enclosure as a response to such condition(s), advancing the design through detail drawings and study models, culminating in a full-scale mockup mold. Construction of the molds will be done at Washington University's facilities combining digital and analog methods of fabrication, including CNC milling, laser cutters, 3D printers, and vacuum-formed plastic, among other methods; a fully equipped wood shop is also available. Once the molds are finalized, they will be transported to Gate's architectural plant in Ashland City, TN, for reinforcing and concrete casting; this project will culminate in the demolding of full-scale precast mockup pieces. Students will tour the facility and participate in the entire fabrication process, including mold preparation, reinforcing, casting, demolding, handling and finishing of the final panels.
Credit 3 units.

A46 ARCH 4362 Advanced Grasshopper

With a base knowledge of the Rhino+Grasshopper interface, this class will focus on developing an entirely scripted building system. Each student will be given a set of initial parameters (building volume, square footage, percent of transparent/opaque facade, required programmatic elements/size, etc.). They will begin by selecting a formal precedent that will help them determine a structural system. Within this framework, students will develop an algorithmic logic to organize program and then articulate a responsive skin. The goal of this exercise will be to develop understanding of the potential use of scripting in design. Scripting allows the designer to transform their design dynamically as the parameters change or update. The final output of this class will be detailed, annotated drawings of each student's structural system as well as a 1/4" scale model of a small portion of their design utilizing available tools in the FabLab such as 3D printing and CNC routing. Students taking this course must have working knowledge of Grasshopper. This class is an advanced class exploring design through generative modeling.
Credit 3 units.

A46 ARCH 436A Information Modeling and Technology

This foundation-level course will introduce students to the digital tools of Geographic Information System (GIS), Building Information Modeling (BIM), and Building Performance Analysis (BPA). Its goal is to equip the student with the ability to gather information, analyze it, and make decisions within the information-rich environment of architectural design and construction. Students will develop an understanding of these three seemingly distinct approaches and their role in preserving the quality and quantity of accumulated information for "upstream" use. The topics addressed in the course will be further developed in more advanced courses during subsequent semesters. The introduction of information-gathering principles within GIS will expose students to the wealth of information, such as maps and census

data, that is already available, as well as methods of turning raw data into analytical material for use in their design work. This segment of the course not only provides a foundation to ArcGIS, but also leads toward use of this information within applications like Revit Architecture. Creating and managing an information pool of digital GIS and design and construction data and making it available throughout the lifecycle of a project is commonly referred to as BIM. In the second part of this course, we will explore how BIM is being utilized today and learn the basics of one of the leading BIM-compliant applications, Autodesk Revit Architecture 2010. During the third part of this course, students will be introduced to BPA, a process that embodies a holistic approach toward the integration of sustainability and design. By understanding when and how to apply sets of analytical exercises via applications like Ecotact Analysis within the context of Information Modeling, students will develop an understanding of how design decisions have a profound and lasting impact on the overall building sustainability and performance.
Credit 3 units.

A46 ARCH 436B BIM in Practice

Building Information Modeling (BIM) is a developing method of creating, sharing and managing project data through a visualized 3D or 4D model. While it continues to deliver on an initial promise to increase design consistency and efficiency while minimizing errors, the focus of attention is shifting to the use of BIM to facilitate integrated methods of project delivery. The course explores the use of the BIM platform and the development of data exchange methods in architectural design through a case study and subsequent design project. Students are provided instruction in Revit covering the creation, management and extraction of data from a model, but also look at the technology more broadly, discussing the changes advanced by the deployment of BIM processes in practice.
Credit 3 units.

A46 ARCH 436D Advanced BIM in Practice

While the adoption of BIM continues to grow across the industry, criticism of its effectiveness as a design tool remains. The foundation of BIM, the creation and management of geometric objects with associated non-geometric data, is often at odds with established methodologies of design. Current practice typically manages this schism by separating design from the use of BIM for documentation and construction. The class will seek to develop methods of design within a BIM environment, not through the translation or reshaping of traditional techniques, but through the design of a methodology that seeks to capitalize on what BIM enables: direct, digital collaboration and the facile management of large data sets. This is not an introductory class. Basic knowledge in Revit (or an alternative BIM software) is required. Skill in other parametric and 3D modeling software as well as a basic knowledge of Grasshopper or other algorithmic processes is strongly preferred. Students will investigate and design digital processes using a short design brief to enable the investigation.
Credit 3 units.

A46 ARCH 436E Technology + Tectonic

Beginning with a rigorous study of three-dimensional grid systems, students will work in pairs to develop conceptual proposals for site-specific hanging installation. Students will examine materiality, grid distortions, and spatial qualities, as well as interactions with natural light and human input. The ideas generated in this course have the potential to directly affect an architectural installation the following semester. Students enrolling in the course should have completed at least one digital seminar as a prerequisite.
Credit 3 units.

A46 ARCH 436F Designing with Grasshopper

The best way to learn how to design with Grasshopper is to use it. Each student will be guided through five different projects incorporating computational design logic throughout. The outputs of this course will be published on Instagram (@wustlhopper) and/or reddit (r/generative). The course will build in complexity as it progresses through Grasshopper methods and plugins. At the end of the course, each student will have completed a 2D patterning project going from Rhino to Illustrator/Photoshop, another 2D patterning project animated in Grasshopper through Photoshop, a 3D patterning project animated in Grasshopper through Photoshop, a simulated interaction using Kangaroo and animated, and a fully rendered looping model incorporating all of the lessons from throughout the course.
Credit 3 units.

A46 ARCH 438 Environmental Systems I

Environmental Systems I is the foundation course in the architectural technology sequence. This course addresses the relationship between buildings and an expanded idea of context, including ideas of environment, landform, energy, material and space. The class places an emphasis on each student developing their own attitude toward architectural sustainability, its role within the design process, and its relationship to architectural form. The class is organized around the themes of climate, site and energy. The theme of climate addresses macro- and micro-climates, and the roles they have in developing architectural form through "passive" strategies. The theme of site expands the idea of the architectural project to examine landform, position, access and region. The theme of energy looks at architecture as both embodied energy and a consumer of energy, to understand how the architect helps to control and direct these flows at macro and micro levels. Two goals for the class are to provide students with ways of thinking about and of working with issues of sustainability, which can inform their design practice, and to equip them with the basic knowledge needed to continue within the technology sequence.
Credit 3 units.

A46 ARCH 438C Expanding Skin

In the 1957 text "The Pliable Plane: Textiles in Architecture," Anni Albers wrote, "if we think of clothing as a secondary skin we might enlarge on this thought and realize that the enclosure of walls in a way is a third covering, that our habitation is another 'habit'." In this text, Albers proposed the concept of skin as an inhabitable layer, first as a covering for the body and then as an expanded layer of enclosure. This course will explore Albers' concept of a second skin by developing new strategies for constructing complex surfaces at the scale of the human body, particularly in the context of digital fabrication and computational design. Emphasis will be placed on assemblies that yield innovative visual or tactile effects while also engaging specific material performance. How can we design with a focus on performative pattern that can enclose the body and its structural and geometric complexities? How can we conceive of patterns that are not disrupted by these complexities but rather enhanced by them? The course will consist of lectures, readings and seminar discussions, tutorials, iterative material investigations, 3D digital modeling, and digital fabrication. Student projects will focus on the design of inhabitable, layered constructions while engaging constructive techniques from both the fashion and architectural disciplines. Rhino (with Grasshopper), Maya or Z Brush will be utilized for the initial digital investigations. Students will experiment with materials and develop innovative construction methods that engage digital fabrication tools such as the 3D printer, laser cutter, and CNC mill for the production of a second skin in the form of a garment for the human body.
Credit 3 units.

A46 ARCH 439 Environmental Systems II

We as architects have to analyze and address complex issues and relationships, synthesize them, and then make them manifest through clear design strategies. Building systems must reconcile solar heat gain, glare control, daylight levels, thermal insulation, ventilation, acoustics, air quality, structure and fabrication — all in relation to the scale and comfort of the human body. The development of environmental systems into a clear, comprehensive, and elegant design solution cannot be an afterthought; it must be a synthesized and integral part of the design process, with a clear strategy that operates at multiple scales. Building upon the passive strategies explored in Environmental Systems I, this course will lay the foundation for the integration of active environmental systems with enclosure, space, and the requirements for human occupation. This will be done through the study of climate, air, temperature, water, light, sound and energy. Each topic will be assessed against problems, principles, possibilities and potential. This course focuses on how important it is to consider active systems as part of an integrated design strategy addressing both *form* and *performance* throughout the design process. Prerequisites: Environmental Systems I & Building Systems I.
Credit 3 units.

A46 ARCH 445 Building Systems

Building Systems will examine the performance and properties of building materials, both traditional and new, through an analysis of assemblies and related systems. Investigations of wood, masonry, steel and concrete and the integration of relevant building systems will provide the fundamental structure for the course. All systems will be investigated relative to their architectural purpose, impact on the environment, relationship to culture/context, technical principles and will also consider manufacturing, construction, our profession and the society in which we practice. Moreover, the course will also examine the performance characteristics of contemporary enclosure technology and explore the impact these technologies are having on design thinking. Although we will focus primarily on the aforementioned topics, we will also identify and consider the impact of other parameters on design and performance such as building codes, role of the profession, health and life safety, systems integration, sustainability and industry standards. The course strives to provide students with a sound familiarity and understanding of traditional building systems in wood, steel and concrete; as well as the skills necessary to represent these systems. The course also seeks to expose students to the material and poetic potential of these technologies related to the making of architectural environments.
Credit 3 units.

A46 ARCH 447A Structures I

Statics and strength of materials through beam and column theory. Loads are defined and states of stress are identified and analyzed. The context of structural behavior is identified and optimal structural behavior and material efficiency structural design is reviewed. Form-active, bulk-active and vector-active structural options are explored relative to the transference of load along the length of structural members. The course applies structural theory to the analysis and design of structural members — beams, trusses, arches and columns.
Credit 3 units.

A46 ARCH 448A Structures II

Continuation of Arch 447A with consideration of the effects of forces on structural members of various materials. Introduction to the design of structural members in steel, reinforced concrete and wood. Prerequisite: Arch 447A.
Credit 3 units.

A46 ARCH 451C Documenting Le Corbusier
This design research seminar will focus on the digital and physical modeling of some of the architectural design projects of the French-Swiss architect Le Corbusier (1887-1965). Students will work in teams to produce drawings and physical models of built projects such as the monastery of La Tourette (1953) as well as unbuilt designs such as the League of Nations headquarters (1926). Students will work individually and in teams. Exhibition and partial publication of the work is anticipated.
Credit 3 units. Arch: CAST, GACS

A46 ARCH 453A Aviation & Architecture: Air Terminal Design and Emergence of Airport Cities
As seaports and train stations were once hubs of commerce and trade, airports serve as vital engines to today's economy, linking cities and regions to the globalized economic landscape. Surrounding airports, entire cities are emerging both organically and in planned developments, building upon the business related to air travel with office parks, conference centers, hotels, entertainment districts and retail. This seminar will be structured in three parts. In the first part, we will examine the fundamentals of transportation architecture and the way air terminal design has developed. Starting as simple structures on an airfield in the 1920s, airports were designed as heroic modern structures from the 1940s to 1980s, ubiquitous terminals in the 1980s thru early 2000s, and most recently as regionally expressive terminals in the 21st century. Students will research, analyze and present case studies, mapping an understanding of the basic architectural components of air terminal design. In the second part, we will explore the rise of airport cities. Students will work in teams of two to research and analyze the planning, governance, impact and growth of airport cities. Sites we will study include developments around Singapore's Changi, Amsterdam's Schipol, London's Heathrow, Paris' Charles de Gaulle, and Chicago's O'Hare. The third part of the seminar will allow students to select a topic of special interest that spans the scale of terminal design and airport cities. Students will initiate independent research to deliver a final paper and presentation on the topic of their choice related to aviation, transportation architecture and planning. Seminars will be supplemented with guest lectures and will be highly conversational. We will explore opportunities for site visits to both airports and airport cities.
Credit 3 units. Arch: GACS, HT

A46 ARCH 453B Art and Architecture
From Ancient Greece to the Renaissance, architecture, painting, and sculpture were regarded as the principal fine arts. In later years, the visual arts were relegated to a separate sphere, independent from buildings and removed from the expediencies of use; however, these positions are perennially contested. How have the distinct positions of art and architecture in private and public spaces been articulated -- and unmade and reworked -- around imperatives such as education, economy, equity, or environment? When has the tension between art and architecture been a problem or a source of inspiration and origin of form? This seminar looks at selected models and the situations, ideologies, and concerns that attended or motivated them. Examples will be drawn from Ancient and Classical periods to the present.
Credit 3 units. Arch: GARW, HT

A46 ARCH 454B Civic Buildings and Perimeter Architecture in the St. Louis Park System: A Study on Fairground Park
This seminar is a design research course examining the Saint Louis park system's complexity from an architectural and identity lens, primarily focused on built works inside the parks and their perimeter architecture. A comparative analysis will focus on Fairground Park at its center. This course provides an overview of the park's social and political history, from the early 20th century to present-day planning. With more than 100 parks in the city, students will work through comparative analyses to study interior and perimeter architecture: civic buildings, housing, infrastructure, and memorials. The architectural and social narratives result in unique community identities and the persistent challenge of disinvestment in under-resourced neighborhoods. Because these parks are anchor points in the city, the course will also consider park-based connective routes to other primary urban hubs. This research project will enhance students' understanding of the civic and social domain while they explore typology and case-study analysis techniques. In particular, students will investigate Fairground Park in North St. Louis as a central focus, including the perimeter bounding this 132-acre urban park. Fairground Park was founded in 1908 as a city park after it was previously sited as the St. Louis Agricultural and Mechanical Fairgrounds, where it hosted the St. Louis Exposition from 1856 to 1902. Attention shifted to Forest Park in 1904, when it became a focal point of the city as the location of the World's Fair, with designs from the same landscape architect, George Kissler. Located near Fairground, College Hill, and O'Fallon, Fairground Park sits within predominantly black communities with high land vacancy percentages. The park itself was a historic racial conflict location, eventually leading to the desegregation of public pools following an injunction against St. Louis by George W. Draper II, an African-American lawyer and civil rights leader who filed suit in 1950. Fairground Park and its surrounding neighborhoods are locations of historical neglect and segregation. A comparative analysis will identify contributing factors of disinvestment to later engage in productive conversations about the park's future.
Credit 3 units. Art: CPSC

A46 ARCH 455A Urban Books
Since the beginning of the 20th century, art, architecture, and urbanism together have investigated the production of images that shape the symbolic dimension of our experience of large cities. The main goal of this course is to critically embrace this tradition through the format of the artist's book. St. Louis is the focus for our observations because it is familiar to our everyday lives and also because it provides key situations for understanding contemporary forms of urbanity and how urban space is produced and imagined. The course bridges the curricular structures of art and architecture by enhancing the collaboration between the practical and scholarly work developed in both schools, with additional support from Special Collections at Olin Library. It combines the reading, lecture, and discussion format of a seminar with the skill building and creative exploration of a studio. This course is divided into three progressive phases of development: The first consists of weekly readings, discussion, and responses in the form of artist's books. The second phase focuses on the Derive with physical activities and assignments based on interacting directly with the urban environment. The third phase focuses on individual research, documentation, and final book design and production.
Same as X10 XCORE 336
Credit 3 units. Arch: GAUI, UI Art: CPSC, FADM EN: H

A46 ARCH 455D Community Design Sprints
In this course, students will provide scoping, phasing, programming, and conceptual design for small-scale yet pressing St. Louis needs through selected projects for community members and small organizations. Students will work directly with a local organization over 7 weeks in to clarify and move forward a community project; students will learn community engagement, facilitation, and communication skills, as well as practicing research, representation, and design skills. Open to upper-level undergraduate students and graduate students of all levels.
Credit 1.5 units. Art: CPSC

A46 ARCH 456B Way Beyond Bigness...or Toward a Watershed Architecture
2015 marked the 10- and 20-year anniversaries of two seminal events that have challenged architects' relationships to large scale, complex societal issues: 1) the publishing of *S,M,L,XL* in October 1995 that featured Rem Koolhaas' manifesto of "Bigness" and 2) the landfall of Hurricane Katrina just outside of New Orleans in August 2005 that catapulted fields of design into an unprecedented post-disaster context. Students will reconcile these two disciplinary jolts by understanding these seemingly incongruous snapshots of history as jumping off points for new modes for architectural activism and opportunism. Students will design a manifesto, in newspaper format, for a future-based discipline of architecture that sails uncharted realms that are "Way Beyond Bigness." This will require the simultaneous submersion and assertion of architecture within other disciplines; the formulation of alternate modes of representations for emerging practice-based models; the blurring of academic and professional agendas in the urgency of activism; and the integration of multiple scales, interest groups and agendas in ridiculously complex and antagonistic situations. Underpinning Bigness and Hurricane Katrina will be additional case studies, guest lectures and field trips that cover: CIAM and the emergence of urban design; Koolhaas' thesis and OMA's early practice; mega-scale urban renewal projects in St. Louis; contemporary investigations into territorial scales of design; and multiple scales of contemporary, integrated Water-based designs, post-Katrina efforts and beyond. This course fulfills the History/Theory Case Studies elective requirement.
Credit 3 units. Arch: GACS, GARW, HT

A46 ARCH 457B Segregation by Design: A Historical Analysis of the Impact of Planning and Policy in St. Louis
This course aims to examine the causes and consequences of American Apartheid and racial residential segregation in metropolitan St. Louis and propose a report that suggests potential mitigation strategies for a given community. This transdisciplinary seminar, bridging humanities and architecture, introduces students to research, theories, and debates currently being conducted on issues of segregation, city planning, urban policy, and sustainability . By placing these debates in a historical and local context, students will discover how policy and decision-making are entrenched in racial, cultural, physical, and socio-economic segregation and engender the spatial transformation of America's divided cities. Students will learn to evaluate and analyze policy and planning throughout the history of the neighborhood to ultimately understand the physical manifestation of segregation during growth and decline. Taking advantage of the academic resources in the region, the course offers a cross-university, cross-disciplinary environment to respond to the importance of this issue. Student teams develop mitigation plans for selected communities in the St. Louis metropolitan region. The teams will be assisted by volunteer professional mentors from diverse fields and residents from the selected communities. The final product of the student teams will be a "book" that will be a compilation of the work of the students in detailing the history of the communities, causes, and consequences of segregation, as well as potential policy and design strategies.
Credit 3 units. Arch: CAST, GACS Art: CPSC EN: S

A46 ARCH 457C Radical Mapping
Maps are instruments of power. We have seen this, for example, in the racially-motivated 'redlined' maps that legitimized urban clearings of entire neighborhoods in American cities in the 1930s. But maps are also instruments of resistance, for visualizing lived experiences and critiquing political systems and relationships of power. Maps are tools for re-writing dominant narratives and spatializing truths. Maps stage new design possibilities. This class will introduce students to the agency and potential of maps and mapping, a skillset all designers need in the face of our current moment of social and environmental justice collapse-a moment that has long been occurring. The course

will cover interdisciplinary theories of mapping; critical cartography; American sub/urbanism; issues of race and place; and techniques of visualization. Students will build a radical 'atlas of spatial politics' centered on selected themes, focused on a common American first ring suburban site-either Ferguson, MO, or Kenosha, WI or similar. There are no formal pre-requisites for the class, but knowledge of Adobe Illustrator and In Design are a must. Students will initially work with GIS ArcMap/ArcPro, a geospatial software-provided free, alongside an introductory tutorial and troubleshooting session/s with the WashU Geospatial Library analysts.
Credit 3 units. Arch: GAMUD, GAUI, UI Art: CPSC

A46 ARCH 457G Creating a Resilient City: Gateway South, St. Louis
This course will examine how the newly launched St. Louis' Gateway South initiatives (an active community redevelopment project) can emerge from collapsed river-front industrial sites to a land of opportunity more resilient in economy, equity, and environment than before. The students will examine the current Master Plan and put forward a holistic qualitative and quantitative approach to achieve strategies for building a pilot, net-zero, and carbon neutrality community. The students will test their ideas at a community scale about environmental resiliency. Architecture students will examine all design solutions in land use, massing, form, transportation, and functionality. Engineering students will study renewable energy applications. The students will learn the State of Arts computational tools in sizing, predicting, and visualizing the community designs and examine their performances.
Credit 3 units.

A46 ARCH 461D Laboratory for Suburbia
During the past five years, America's suburbanized landscape has emerged as a site of urgent electoral, cultural, and spatial contestation; it is arguably the defining geography of the national political moment. The fields of design and art, however, have largely failed to engage this critical space, remaining focused instead on prestigious cosmopolitan destinations and distressed inner-city communities. This interdisciplinary course will ask students to step into this gap, exploring and proposing new forms of critical suburban practice. This course is interdisciplinary, and students with interests in visual art, architecture, urban design, art history, public art, planning, performance, urban history, American Studies, and anthropology are especially encouraged to enroll. For the course's final project, students will draw from research and fieldwork to produce propositions for interventionist art or design projects in St. Louis. Final projects can include "paper architecture" renderings, sculptural maquettes, video works, performances, curatorial projects, or scholarly papers that point toward new models for critical and visionary suburban practice.
Credit 3 units. Arch: GAMUD, GAUI, UI

A46 ARCH 462F Wellness in Buildings
The WELL Building Certification Standard is a tool to enhance human health and well-being in buildings. This course investigates the relationship between the built environment and human health to promote well-being through design strategies and operational protocols based on a designated occupational therapy clinic office in St. Louis. Students will investigate design concepts and new technology that can improve building performance and thermal comfort to enhance the healing process for disabled occupants. Students will accumulate evidence of well-being by measuring air, water, and light quality. Students will track human productivity and building performance. The final project will be a team research effort that dives into current WELL Building certification systems to assess the wellness of a designated clinic office to meet human needs in water, energy, and green space integration. Experts from USGBC and IWBI will deliver guest lectures on various topics throughout the course.

Credit 3 units.

A46 ARCH 462H Information Modeling for Sustainable Design
This course will focus on the principles of sustainable design as examined through Building Performance Analysis (BPA) and applied Building Information Modeling (BIM) methodology. The foundation for this course will be an introduction to BIM and BPA and the significance of both for the future of sustainable architectural design practice supported by analytical modeling. This emphasis on the suitability of building modeling for analytical purposes and on the interpretation of such data will provide the basic knowledge necessary for the second phase of this course, in which students will use a previous or current studio project for an in-depth study of their building's performance in the context of its chosen site. Exploring the interaction between the simulated environment (climate, isolation) and the virtual building with its physical characteristics (materials, assemblies, passive design strategies, heat transfer, daylighting, embedded energy), we will attempt to confirm and test the principles of sustainable design at the schematic level of project development. The model analyzed by each team will provide sufficient comparative information for a design approach whose desired goal is carbon neutrality in the lifecycle of the building. Students will be encouraged to investigate the suitability of analytical modeling software, in the context of critical design methodology. Prerequisites for this course are a basic understanding of BIM methodology and insight into sustainable design practices. Fulfills Digital elective requirement.
Credit 3 units.

A46 ARCH 462I Design Strategies for Energy Efficiency
High-performance, zero-energy buildings are an integral part of addressing climate change, pollution, social inequality, and other urgent contemporary issues due to the outsized impact the built environment has on global energy use. The course will allow students an opportunity to learn the technical skills required to design highly efficient buildings using energy modeling and simulations. The energy impact of the building's orientation, thermal envelope, fenestration, shading, air sealing, thermal bridging, thermal mass, ground contact, natural ventilation, and mechanical systems will be examined. Emphasis will be placed on cost, performance, sustainability, renewable energy, and the professional designer's role in efficient buildings. The course concludes with each student completing a cumulative project which encompasses a whole building approach to energy efficient design. Each of these projects will be specific to the individual student and focused on the energy efficiency design principles which relate to the type of building, occupancy, climate, and design aesthetics of the project. Students will need to exhibit mastery of the concepts and techniques used throughout the semester in order to synthesize the existing constraints with energy efficiency, sustainability, and design excellence. Prerequisite: Students must have either completed or waived A46 438 Environmental Systems I in order to register for this course. Students who have waived Environmental Systems I with the exception of Site Planning are eligible to register.
Credit 3 units.

A46 ARCH 462M Pattern Recognition
Interrogates a recent history of architecture replete with pattern. Case studies of patterning in contemporary projects are undertaken through the production of analytical, computational models to reveal an underlying logic of performance and construction. In parallel, the course presents a theoretical survey of related issues in art, psychology, computation and ecology. In this context, pattern is understood as a performative expression of an ecological system, distinct from historical issues of ornament and representations. Informed by the analysis, students then digitally produce an original pattern, both graphically operative and spatially materialized.
Credit 3 units.

A46 ARCH 462N Constructing Ideas
Constructing Ideas is about creating design concepts and transforming these into built architecture. We will learn how conscious imagination and coherent interventions lead us to ideal realities. This class examines the design and construction process as academic research. We consider the practice of making architecture as a synthesis of analysis, interpretation and transformation. Studies will teach us how a building idea influences its construction and how the knowledge about construction can become the starting-point of an idea. Interrogating design problems and investigating existing typologies as a methodology will lead us to specific answers. We will explore conceptual-artist practices and examine their strategies, learning to lead with intent, play with parameters and question the givens. From there, we will look at examples of Swiss architecture whose early integration of construction in the design process has a long tradition. One could say that the bearing itself gets designed in Switzerland. We will consider invisible structures and material specificity. Learning this language gives us the ability to transform our ideas into specific architectural expressions and precisely tailored solutions. The form of the seminar is experimental. We consider our meetings to be spatial and contextual interventions, precisely designed like architecture. Sessions will vary, from a lecture to an exhibition, talks, a dinner — the goal is to be very conscious about what we are doing. This process is going to be documented through the whole semester. Each student will create his own design thesis and realize an installation that reflects it. The results will be exhibited and presented to the public.
Credit 3 units.

A46 ARCH 462S Solar Decathlon Design Challenge
The way buildings are designed and constructed today are adapting in response to the changes occurring in the world around us. Issues such as climate change, resource scarcity, and economic pressures, are driving the construction of high-performance buildings that can be powered by renewable energy systems to offset all of the building's annual energy consumption. The course will focus energy performance as it relates to design strategies using energy simulations and other design tools to quantify the effect various design strategies have on building performance. The design problem for the semester will focus on a competition called the Solar Decathlon Design Challenge. This is a team competition which will culminate in a final project submission for the competition and potential for travel to present to the competition jury.
Credit 3 units.

A46 ARCH 463B Emergent Urbanisms
This course surveys emergent models of urbanization in globalizing cities that thus far defy categorization or exist peripherally in studies of urban form. The goal of the course is to equip students with the theoretical and historical background, the analytical tactics, and the critical awareness necessary to reposition themselves as designers in these increasingly challenging contexts. Through case study examples and supporting readings, the course deciphers the formal, social and environmental effects of particular processes defining new urban spatial configurations in city-regions around the globe. Most of these processes are driven by discourses of "efficiency," such that urban forms are increasingly inflected by economic operating systems, as they are subsequently detached from traditional concerns of livability and public interest. Emerging urban assemblages include: massive manufacturing warehouse landscapes or logistical distribution centers and "aerotropolis" transit hubs as well as those spaces left behind by regional restructuring: de-urbanizing (or deliberately erased) environments that contradictorily "enable growth" in other areas (or over the same areas); and the informal settlements that emerge more spontaneously on the margins of mainsteam urban policy. Students use their understanding of these spatial and logistical configurations

to project creative models for re-direction or engagement. Sources and analytical tactics are drawn from across fields including design, sociology, geography and history. Fulfills Urban Issues elective requirement, MUD-Track elective requirement.
Same as A49 MUD 463B
Credit 3 units.

A46 ARCH 463C Invisible Cities
This graduate and advanced undergraduate seminar takes as a point of departure the famous 1972 Italo Calvino text that reframes a single city (Venice) as multiple cities, told through a sequence of discrete narratives and descriptions. Each of Calvino's invisible "cities" reflect different emotional and physical environments and possibilities — or impossibilities — for their inhabitants, yet are all still connected through an overarching narrative. Invisible Cities, the course, builds on this premise that a city is not a one-size-fits-all experience (nor a monolithic construct with a uniform constituency), but instead is composed of radically different environments all selectively accessed, depending on one's positionality or relationship to urban redevelopment processes. In places like St. Louis — but in fact in all American cities — residents live out different urban realities or imaginaries, with unequal access to the same services, provisions and processes. A highly visible instance of this occurs along Delmar Blvd in St. Louis where two contrasting lived experiences play out in neighborhoods across from each other on the north-south divide. However, this class posits that much less visible instances of the duplicitous city also exist, in spaces not geographically divided, but (more insidiously) overlaid. The course will focus on this conceptualization of inequality where both privileged and underserved populations co-exist in much more intertwined ways. Within any given block, neighbors live according to different opportunities, for education, health access, police services, or routes to property acquisition and financing. These are the invisible, spatially simultaneous cities; the urban realities that are much harder to see — at least to those who do not live those realities on a day-to-day basis. Like in Calvino's world, urban and lived space is endlessly continuous and accessible for some; for others it is fragmented, even disorienting or opaque. This course will examine, frame, collect and document the various manifestations of invisibility together with the political instruments and policies that produce — and reproduce — it. We will use the St. Louis region as our primary focus, with comparisons to other sites. Our studies will involve a close re/reading of many of the mechanisms of daily governance and urban design such as policies, planning tools, legal, financial and real estate protocols and of course design decisions and processes; i.e., the apparatuses of urban redevelopment that exist right before our eyes. The seminar welcomes both graduate students and advanced undergraduate students from across disciplines. Support for Invisible Cities is provided by the Washington University in St. Louis Ferguson Academic Seed Grant Program granted through the Offices of the Chancellor and Provost and the Olin Business School. Fulfills Urban Issues and MUD Track elective requirement.
Credit 3 units. Arch: GAMUD, GAUI, UI

A46 ARCH 463D City Life and Urban Worlds: An Introduction to the Urban Humanities
The urban humanities is an inter-/anti-disciplinary project that brings together theory, practice, and methods from fields in architecture, urban design, and the humanities to interrogate the urban condition. In this core course, we will delve into key theorists, texts, and methods that inform the urban humanities through seminars, site visits, and design projects. We will debate emerging perspectives in critical urban theory and then explore the applicability of these positions in St. Louis through mapping, street ethnography, and subtraction. In addition, this seminar is designed to introduce urban scholars from across the humanities and design fields to each other. Participants will be encouraged to experiment, trade, and engage in dialogue across their

fields. What, we will ask, is the status of the urban commons in an era of enclosures and privatization? What can postapocalyptic cyberpunk from Lagos teach us about "smart cities"? How do built environments get their politics? Can these politics be redirected or subverted?
Same as A49 MUD 463D
Credit 3 units. Arch: GAMUD, GAUI, UI Art: CPSC

A46 ARCH 464A Architecture and Photography
Seminar deals with issues raised by use of photography by architects, historians and critics. Seminar confronts the assumption that our knowledge of notable buildings and architectural space is based primarily on the photographic image. Photographs are tacitly accepted as objective facts, and the pervasiveness of photography in magazines, books and exhibits as substitute for direct experiences is rarely questioned. Goal of seminar: to foster a healthy skepticism of photographs, and to investigate the role of photography as a means of record and convey complex spatial conditions by the ordering conventions of the frame. While not technical, the course introduces students to technical aspects of photography that are particularly relevant to architectural photography: parallax, lighting, lens distortion, depth of field, format and grain, cropping, photomontage and point of view. Fulfills history/theory requirement.
Credit 3 units.

A46 ARCH 465C Art, Design and Entrepreneurship: Creative Placemaking Beyond The City
This course invites students from diverse areas of interest to engage with the cultural landscape of Marion County and Hannibal, Missouri — a region that, through the work of Mark Twain, popularly epitomizes both rural life and the allure of the Mississippi River. While a quarter of a million tourists visit this area each year to follow in Tom Sawyer's footsteps, the work of local artists, designers and entrepreneurs are innovating the narrative of this place and opening up room for consideration of African-American experience, local food systems, and the complex series of social and economic connections within life along the Mississippi. This course puts that spirit of collaboration and imagination in the hands of students, challenging them to think beyond the borders of their disciplines to create projects that present new connections between place, community and culture to both rural and urban audiences. The National Endowment for the Arts defines creative placemaking as an opportunity when "public, private, not-for-profit, and community sectors partner to strategically shape the physical and social character of a neighborhood, town, tribe, city, or region around arts and cultural activities." Through fieldwork, research and idea-creation, students collaborate with mentors on the ground to create locally appropriate projects that address questions of culture and design in the region. Occasional off-campus visits are joined in the classroom to a wide range of readings, case studies, and webstreamed conversations with national leaders across fields. The course concludes with small teams designing a specific plan, event, or project that could later be implemented in the community.
Credit 3 units.

A46 ARCH 467A Disappearing Act
What does erasure make, and how might we reconstitute what has been lost? This seminar will explore the architecture of ghosts: things thought to be lost or destroyed, or which can no longer be accessed. This representation-forward class will test a range of drawing and making techniques in various media and scale to foster a dialog about what drawing misses and the presences and absences of the built environment. We will frame our work and ideas in architectural discourses of subtraction, palimpsest, and productive removal. Our work will capture the dynamism and logic of the built environment.
Credit 3 units.

A46 ARCH 470G Edges of Privacy

In collective housing, interactions between neighbors occur in often tight spaces of shared access. In hallways, walkways, stairs, and landings, proximity to the private spaces of the dwelling is extreme. Many architects have been experimenting with open-walkway access type in collective housing beyond an economical means of circulation. Buildings that use open-walkways-which in colder climates can be glazed-often provide energy savings, as they allow for the cross-ventilation of units and can serve as climatic buffers and passive heat sources. Additionally, these spaces offer potential scenarios of both conviviality and conflict, a contrasting condition to be reconciled through design to create housing for diverse groups of people. In this seminar, students will explore selected historic and contemporary housing examples with open access walkways-both successes and failures- in Europe and Latin America. Through lectures, research, analysis, discussions, and rigorous redrawing of selected buildings, students will examine-organizationally, spatially, and socially- the modes of interaction afforded by design and the potential for this access type. The seminar is part of the ongoing research project "Edges of Privacy. Open Access Walkways in Collective Housing" and the work may result in a publication and exhibition. It is open to undergraduate juniors and seniors and graduate students who have completed the core sequence.

Credit 3 units.

A46 ARCH 471A Continuity and Transformation

Throughout history and across cultures, certain ideas, concepts and organizational strategies have persisted in architecture, despite advances in social ideals and technological capabilities. The seminar explores the phenomenon of this continuity with the goal of uncovering the manner in which these ideas and strategies are transformed. Whether classified by use, characteristic form or compositional device, the continuity of these notions is clearly traceable as a body of knowledge waiting to be revealed, understood, assessed and, when valid, built upon. The transformation of ideas and strategies is one of the most fundamental activities of the designer, but relies on careful study. We discover evidence of this phenomenon in vernacular architecture, patterns of settlement and habitation, and in the work on many of our most influential practitioners, such as Le Corbusier, Kahn, Moneo and Zumthor, as well as in the realm of painting and sculpture including Cubism, Suprematism and Expressionism.

Credit 3 units.

A46 ARCH 472 Sustainable Development

This seminar is an introduction to the basics of small- to medium-scale development. It will begin with a series of introductory lectures covering the principles and tools of development, such as creating a project performa, basic tax credits, TIFs, and financial structuring of a project; exploring methods of implementing sustainable practices and designs into development-driven projects through marketability, cost-savings, tax credits and other incentives; and investigating the process of real estate development through the use of sustainable ideas and practices in buildings. It will continue with a series of case studies in which the class will examine models of existing developers in terms of these base elements. Finally, students will be asked to develop a project in order to understand the architect-client relationship and how to stimulate recognition of the value and importance of sustainable design in real estate development.

Credit 3 units.

A46 ARCH 475D Landscapes Through Time: The History of St. Louis' Built Environment

From the Mississippian mound builders to the urban conditions of the present day, this course will investigate the different approaches of various cultures to creating built environments that meet the needs of their time in terms of landscapes and structures. Using the City of St. Louis as an example, the course will examine the layout and infrastructure of the city at various periods, discussing the effects of technological changes in the creation of structures, improvements to transportation, facilitation of trade and the effects of these forces on the cultural and built landscape of the city. The course will also trace the history of inequity within the city and the imposition of racial apartheid. Each class session will discuss the structures and landscapes that defined individual eras in the history of the city, and the ways in which these were successful or unsuccessful. This course fulfills the History/Theory Case Studies elective requirement. Requirements will include a mid-term paper, two in-class reports and a final paper.

Credit 3 units. Arch: CAST, GACS

A46 ARCH 475E History of the Modern Art Museum

This seminar explores the development of the modern art museum as an architectural type, measured against evolving nature of display objects, curatorial practices, and demands of the viewing public. Since the consolidation of the type in the early 19th century, the art museum has been the primary site where the symbiotic trajectories between artistic and architectural development have played out. Also to be examined is the importation of this program into non-Western countries, which responded with their own canons and classifications of fine art. The course ends with recent case studies where architecture has made new, often aggressive, commentaries on objects it is designed to display. The course is open to graduate students and advanced undergraduate architectural history minors. Fulfills History/Theory elective requirement.

Credit 3 units. Arch: GARW, HT

A46 ARCH 478B Modern Architecture in St. Louis, 1930s-1970s

This seminar will examine postwar modern art and architecture in St. Louis within the changing design and social contexts of the postwar era, which included massive spatial and racial transformations. Using artworks, photographs, films, and architectural drawings and models, this course will bring together design and social documentation to understand this remarkable creative and conflicted period in St. Louis's history. Michael Willis, FAIA, will also give several lectures and lead two tours. Students will present selected readings and pursue individual research projects for this course. Prerequisite: A46 4284 or equivalent course taken elsewhere.

Credit 3 units. Arch: GARW, RW Art: CPSC

A46 ARCH 486A NOMA National Design Competition

This course allows students to work collaboratively to develop a comprehensive body of work (including presentation boards, physical models, and animated digital graphics) in response to the National Organization of Minority Architects' (NOMA) Barbara G. Laurie Annual Student Design Competition. Students work in pairs to develop thorough schematic-level solutions. After the midterm review, the class selects the strongest overall team project and uses that as a basis to develop highly detailed plans, elevations, sections, details, 3D views (animation optional), cultural, sustainable, and accessibility design concepts. Not only does this activity culminate into a final review, but students submit and formally present their design solution at the annual NOMA (http://www.noma.net/) Conference. CET (https://gephardtinstitute.wustl.edu/for-faculty-and-staff/community-engaged-teaching/) course.

Credit 3 units. Art: CPSC

A46 ARCH 490A Explore & Contribute: Collaboration Between Washington University & Henry Elementary School

Principal Esperansa Veal of Henry Elementary School is creating a remarkable place for her students who live in the neighborhood of the Cochran Gardens Federal Housing Project in downtown St. Louis. Principal Veal is clear in her conviction to provide each of her students with both literal and academic nourishment, and is working

unceasingly to make the Henry School a safe and creative oasis for children ages pre-school through grade six. Her goal is to have the Henry Elementary School students explore sustainable ways to live during the 21st century. To this end, we will emphasize ecological sustainability, environmental health, personal responsibility, leadership and a comprehensive, high quality academic program. With an emphasis on the environmental sciences, energy alternatives and conservation, recycling, organic gardening and the food sciences, and the emerging "green" economy, students will focus on developing the math, science, writing, and hands-on skills that will make them successful leaders to make a difference in improving the environment for humanity. This course invites undergraduate and graduate students from different fields of study to apply their discipline to the goal of designing and teaching hands-on problem-solving projects for students at the Henry Elementary St. Louis Public School, located across the street from Cochran Gardens Housing, at 1220 N. 10th Street. Gay Lorberbaum, with advising from Principal Veal, will work individually with each Washington University student to develop the right fit between the creative contribution each Washington University student wants to offer and the vision Principal Veal has for each age group of students at Henry Elementary School. Students enrolled in this course will work on-site at Henry Elementary School during the scheduled meeting times. The will be an additional meeting on campus for one hour on Wednesdays at a time to be determined later by the enrolled students. CET (https://gephardtinstitute.wustl.edu/for-faculty-and-staff/community-engaged-teaching/) course.
Credit 3 units. Art: CPSC

A46 ARCH 4930 In\Visible St. Louis: People, Place, and Power in the Divided City

This course approaches the study of segregation and inequality in St. Louis as deeply relational and contextual -- that is, embedded in a particular space and place and constituted through social-political relations. Students will be immersed in the history, theory and contemporary academic debates surrounding inequality, segregation, and social justice initiatives in urban cities across the United States. The course pairs this theoretical base (conceiving of segregation as multifaceted and durable, historical, spatial, and interpersonal) with intensive research experiences drawing on the methodological tools available across sociology, urban design, and architecture (archival research, data collection, mapping, diagramming, interviewing, field observation). Students will initiate collaborative research projects aligning with the needs of local organizations that serve the city's historically disadvantaged populations. Local guest speakers (scholars, community leaders, residents) will enhance students' classroom learning, as will site visits and other discussion formats. This interdisciplinary course bridges the Department of Sociology and the Sam Fox School of Design and Visual Arts, a collaboration supported by The Divided City initiative.
Same as I50 INTER D 4930
Credit 3 units. A&S IQ: SSC, SC BU: BA EN: S

A46 ARCH 499 Senior Capstone in Architecture

The Senior Capstone in Architecture allows undergraduate students in their final semester of study to pursue individual research projects. All students will participate in shared discussions and presentations, as well as pursue a highly individualized line of research inquiry that potentially starts where a former project left off, supplementing current or previous course work, or investigating a previously unexplored route. The course will culminate in a presentation and defense of a well-articulated and developed research project.
Credit 3 units.

Landscape Architecture

Visit online course listings to view semester offerings for A48 LAND (https://courses.wustl.edu/CourseInfo.aspx?sch=A&dept=A48&crslvl=1:4).

A48 LAND 304 Shared Ecologies and Design

This interdisciplinary course will introduce biological, social and cultural ecology concepts to proactively address current stressors that impact and are being impacted by design and the built environment. These effects and affects range from (but are not limited to) climate change science; racial and social justice impacts; sustainability, resiliency and adaptation-design strategies; systems-based and multi-scalar understandings; and interrelational human and non-human environments bound in both acting and being acted upon locally and globally.
Credit 3 units. Arch: ECOL

A48 LAND 315B Historic Preservation, Memory and Community

Whose history is significant enough to be worth preserving in physical form? Who gets to decide, and how? Does the choice to preserve buildings, landscapes and places belong to government, experts or ordinary people? How does the condition of the built environment impact community identity, structure and success? This place-based course in historic preservation pursues these questions in St. Louis' historically Black neighborhood The Ville, where deep historic significance meets a built environment conditioned by population loss, disinvestment and demolition. The course explores the practice of historic preservation as something far from neutral but rather considers it as a creative, productive endeavor that mediates between community values, official policies and expert assertion. Critical readings in preservation and public history will accompany case studies, community engagement and practical understanding.
Credit 3 units. Arch: GAUI, UI

A48 LAND 401 Landscape Architecture Design Studio I

This core studio explores design principles common to architecture and landscape architecture as well as their own specificity. A series of problems focuses on the relation of component to space through conceptual, analytical, formal and perceptual investigations.
Credit 6 units.

A48 LAND 402 Landscape Architecture Design Studio II

In this core studio course, students develop a spatial understanding of landscape architecture through a series of exercises of varying scale and complexity. Building design skills incrementally, students acquire facility with the manipulation of ground plane and the elaboration of vegetation and material strategies at both site and urban scales. The studio fosters an appreciation of landscape architecture as a systemic construct with formal, ecological and social implications.
Credit 6 units.

A48 LAND 421 Landscape Representation I: Hand Drafting, Drawing and Sketching

The beginning course in the representation sequence introduces students to freehand and mechanical representation as a means for developing and communicating design ideas. Students build a basic understanding of orthographic drawing typologies and traditional drawing materials. Emphasis is placed on development of observational skills, building a design vocabulary, basic drawing skills, and the techniques of landscape architecture and architectural representation.

Credit 3 units.

A48 LAND 423D Videography for Designers

This seminar course examines the practice of capturing, producing and analyzing moving images as a method of inquiry for design. We focus on the analytical and communicative qualities of time-based media (recorded sequences, video, slideshows, animation, simulation, remote sensing, etc.) as a human-landscape intermediary that has the ability to alter understanding and evaluation of the environment. We explore techniques from a range of disciplines — art, design, sociology, anthropology, etc. The course meets weekly for brief lectures/presentations to direct our inquiries, discussion of foundational readings and ideas, media workshops, screenings, local field trips, and/or student presentations of work. Throughout the semester, students generate brief, exploratory work that focuses on methods and techniques, and a larger, final project that engages the themes of the course. Open to all graduate and upper-level undergraduate students, a goal of the course is to blur boundaries between art and design, and to capitalize on their various approaches. No experience with video, animation or other software is required — only the desire to explore and incorporate time-based methods into individual processes.
Credit 3 units.

A48 LAND 423E Cinematic Landscapes: The Making Of

Watch movies. Talk about movies. Analyze the making of movies. Make a movie. Climate-themed movies. Post-apocalyptic movies. Meet in technology. Learn to scientifically use drones. Learn to scientifically use LIDAR. Use these tools in your climate-themed movie. Sculpt stories in time, supported by sound. This course will focus on the analysis of landscapes and cities as portrayed by popular cinema. How eidetic portrayals of nature and cities are circulated by popular cinema. Stories through which the values, common referents, public concepts, and memes of a culture materialize through the construction of movies. Interior to the semester there is an interdisciplinary workshop. Four-day fieldwork with Geology Assistant Professor Alex Bradley. Map and produce digital representations at 2-cm resolution of a mountainside scoured by a burst reservoir. This class is divided into three parts: watch, learn, and make. Watch: Each week, students will be asked to watch one movie and one director's commentary, often referred to in the "bonus features" as "the making of." Learn: Students will study the methods and techniques used to create settings, props, and storyboards in the service of a sound vision. Make: Students will synthesize digital and analogue time-based media tools (sound and video) to make a movie thematically based on climate change.
Credit 3 units.

A48 LAND 424M Spatializing Extremes: Graphic Explorations on Projected Climate Futures

As architects, we communicate through a language of visual representation. We use drawing as an act of translation - to spatialize ideas and information in a way that could arguably be understood universally. Furthermore, we use drawing as an act of persuasion - to convince others of our designs, positions, and intentions. In the culture of immediacy that we currently find ourselves in - an era where the image and the video dominate our scrolling - it's more important than ever to produce compelling graphics that aid in the dissemination of information. This course explores how architects can harness the power of architectural representation to construct spatial narratives of text-based research and data, particularly regarding the interdisciplinary science surrounding projected climate futures. We will operate contextually through a lens that does not try to prevent the extremes of climate change, but rather accepts these new realities that we have already begun to find ourselves in, that of extreme weather events, floods, droughts, sea level rise, plant & animal migrations, and human migrations, among others. How can we translate existing climatic research into compelling graphics? How can we persuade an audience of the need to adapt our built environment and existing infrastructures in the face of these alternate realities? From there, how can we speculate on these conditions in a way that compels different thinking surrounding adaptation and resilience? The course will explore these questions through the generation of narrative drawings, working iteratively through a variety of digital drawing techniques towards a composition deeply layered with multiples sources of information as well speculations on climatic futures.
Credit 3 units. Arch: ECOL

A48 LAND 430C Special Topics: Pyrocene

In the last five years, cataclysmic wildfires have raged globally, burning hotter, faster, larger, and longer in California, Australia, the Amazon, and beyond. A firestorm of images -- frantic smartphone footage, smoldering drone shots, panoramas of orange haze -- has ushered a vision of an apocalyptic "new normal" into public consciousness. In 2015, the scholar Steven Pyne coined the term "Pyrocene" to describe our current "age of fire," defined not only by the accelerated burning of living landscapes but also "lithic" ones, in which the spectacle of the fire crisis can only be understood in relation to deeper climatic and cultural transformations produced by fossil fuel combustion. This interdisciplinary seminar will explore avenues for architectural and cultural practice in the Pyrocene, which some scholars have called the "arts of living on a damaged planet." Approaching wildfire as a phenomenon at the intersection of landscape and urbanization, the course will center design disciplines but also develop robust connections to political ecology, eco-aesthetic art, decolonial anthropology, eco-poetic literature, and ecologically oriented philosophy. Drawing from readings and case studies in various fields, students will experimentally develop projects that traverse diverse critical frameworks for understanding, shaping, inhabiting, and tending contemporary fire landscapes.
Credit 3 units.

A48 LAND 430E Special Topics: Solar Decathlon Landscape Strategy

A solar decathlon house is currently being designed and constructed by Sam Fox architecture students for entry into the 2017 competition to be held in Denver, Colorado. This summer landscape architecture studio will develop the design and construction drawings for the high-performance landscape system that sustains the house. It will provide energy, light, water and food.
Credit 3 units.

A48 LAND 453 Advanced Planting Design

This course focuses on both the cultural, environmental, scientific and the technical aspects of planting design. The course is taught in three modular sessions: horticulture and the science of plants; typologies and design such as bosque, grove, glade, allée, meadow, wetlands, hedgerow, etc., and their origins in productive landscapes, application to contemporary landscape architecture; and the practical hands-on experience in the field with both design documentation to installation techniques. The course offers several field trips to experience urban revitalization, various design typologies, sustainable land use, reclamation and restoration.
Credit 3 units.

A48 LAND 480B Mapping the Metropolitan Mississippi

This seminar explores the relationship of city to river through reading, recording and mapping. Students document their research, create proposals and develop simulations and/or prototypes for a site on the St. Louis riverfront. Methods of inquiry combine hand-recording, photography, GIS techniques and DIY devices. The course alternates discussion sessions, field research and lab. Open to all graduate students; undergraduates require the instructor's approval.
Credit 3 units.

A48 LAND 483A Emergence in Landscape Architecture
This course investigates the roles of emergence theory in landscape architectural discourse. For the purposes of the course, emergence is considered as the development of new and/or different conditions as a result of disturbance. Disturbance can take many forms, and the phenomena that are subject to disturbance are many and varied. Landscapes are continually disturbed by social, economic and physical irruptions, but cognitive structures, perceptual frameworks and cultural values are also subject to turbulence that, as with landscape disturbance, often leads to innovation, novelty and resilience. The course explains what emergence theory is, where it comes from, how it relates to environmental design in general, and how it has — or could — change the way we design human and nonhuman inhabitations. Through readings, presentations and discussions, students are able to connect the rise of emergence theory in cultures of contemporary thought to its application in practice. The main theme of the course is the potential for emergence theory to enable us to relate qualitatively different modes of existence (human; nonhuman) to each other and through the connections thus established improve the lifeworlds of all. The structure of the course is based around ten key concepts of emergence, as follows: open systems, situation, initial conditions, assemblage, nature cultures, difference, field theories, disturbance, morphogenesis, formless. Each student investigates one of these concepts and presents their findings to the class.
Credit 3 units. Arch: ECOL