Architecture

Sam Fox School of Design & Visual Arts

The Sam Fox School of Design & Visual Arts 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.

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 and to 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 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. The Art & Architecture Library and the Mildred Lane Kemper Art Museum are in the new Kemper Art Museum building. Steinberg Hall also houses studio and review space.

In 1967, the School of Architecture became one of the first schools in the United States to offer a pioneering six-year joint-degree (Bachelor of Arts and Master of Architecture) program. The 4+2 program now leads to a thorough four-year Bachelor of Science in Architecture degree, followed by two years of graduate study for the accredited professional Master of Architecture degree. 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.

Equally, the college offers the four-year Bachelor of Design degree with a major in architecture — a strong, flexible undergraduate curriculum that also prepares students for graduate study in architecture, usually for three years. 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.

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

Undergraduate Degree Programs

The College of Architecture offers course work leading to two undergraduate degrees: the Bachelor of Science in Architecture and the Bachelor of Design in Architecture. The requirements for both degrees are the same through the junior year.

Students begin with a Sam Fox School foundation drawing course taken with first-year students in the College of Art and two design courses particular to architecture. They take required courses in the College of Arts & Sciences and electives in architecture and the Sam Fox School.

For the Bachelor of Science degree, students continue to study architecture in depth through the senior year. For those in the Bachelor of Design program, the fourth year offers flexibility in studying outside of architecture or pursuing other electives in architecture and art.

Continuing for graduate study years:

Students receiving the Bachelor of Science in Architecture degree can apply to two-year Master of Architecture programs. Students receiving the Bachelor of Design degree with a major...
in architecture usually apply to three-year Master of Architecture programs (see Graduate Degree Programs below).

If a student enters the College of Architecture as a first-year student, he or she may complete both the bachelor’s and the master’s programs in a minimum of six years, in a professional degree structure called the 4+2. Using the Bachelor of Science in Architecture degree as the initial basis, the 4+2 curriculum allows a student to spend four years as an undergraduate and two years as a graduate student in the Master of Architecture curriculum (see the 4+2 Program information).

Further information on the particular requirements and curricular structures of the undergraduate degree programs is listed below.

**Combined Studies**

Washington University offers students the option to study across disciplines and to take advantage of the wide range of courses available. Students may choose to major in architecture and minor in another subject; major in architecture and choose a second major in another area within the College of Arts & Sciences; or major in architecture and choose a second major in an area from a different undergraduate school.

**Special Programs and Resources**

**Cooperative Program in Architecture**

The Graduate School of Architecture & Urban Design has established agreements with a number of primarily undergraduate liberal arts schools in the United States to allow their students to take advantage of the Cooperative Program in Architecture. Cooperative Program students are able to begin their architectural studies at Washington University in their senior year while still enrolled as undergraduates. Their undergraduate degrees will come from the home institution where they reside for three years, yet they include within their four-year baccalaureate degree program one year of study at Washington University. For more information, contact: Cooperative Program in Architecture, Washington University in St. Louis, Campus Box 1079, One Brookings Drive, St. Louis MO 63130. Call 314/935-6227 or 800/295-6227 (continental U.S.) or e-mail wuarch@samfox.wustl.edu.

**Study Abroad**

A summer Architecture Study Abroad Program (Arch 484A) is available for sophomores and juniors in the College of Architecture. This six-week, 6-credit program takes students through significant European or South American cities, in a directed curriculum of urban and building analysis and appreciation. In the spring semester of the sophomore year, architecture students may apply for the college’s junior year, spring semester architecture program in Florence, Italy. In the fall of the senior year, architecture students can study a full architecture curriculum with the Danish International Studies program in Copenhagen, Denmark. These course credits are approved for full transfer to degree studies in the College of Architecture. For more information, contact the Office of the Dean in the College of Architecture.

Architecture students are eligible to participate in the university’s study abroad programs.

**Independent Study**

Opportunities for independent study are available to all graduate and undergraduate students. Registration in an independent study course requires sponsorship by an instructor and permission of the dean. A maximum of 5 units (graduate students), 3 units (juniors and seniors), and 1 unit (freshmen and sophomores) may be taken per semester. Independent study courses cannot replace architectural design studios or other required courses. An independent study proposal sheet approved by a faculty sponsor must be submitted to the Office of the Dean at registration time.

**Summer School**

The College of Architecture offers a limited number of courses during the summer, primarily ARCH 447A Structures I and ARCH 448A Structures II.

**Graduate Degree Programs**

The Graduate School of Architecture & Urban Design’s degree programs include a range of curricula for students with a variety of educational backgrounds, professional degree needs and career ambitions.

Most states require that an individual intending to become an architect hold an accredited professional degree. The National Architectural Accrediting Board (NAAB) accredits two types of degrees: (1) the Bachelor of Architecture (not offered by this College of Architecture), which requires a minimum of five years of study, and (2) the Master of Architecture, which requires a minimum of three years of study following an unrelated bachelor’s degree or two years of study following a related pre-professional bachelor’s degree. These professional degrees are structured to educate those who aspire to registration/licensure as architects.

The graduate school’s Master of Architecture degree (MArch 3 and MArch 2 programs) is an NAAB-accredited professional degree. The school’s NAAB-accreditation status was evaluated and confirmed in the spring of 2005.

**Master of Architecture Degree**

Students holding bachelor’s degrees in fields other than architecture are invited to apply to the graduate school’s accredited professional MArch 3 degree program. Elementary calculus and physics are required as prerequisites for enrollment. While the curriculum typically spans seven semesters, students may complete this professional studies program in a minimum of three years including two summers.
Students with the Bachelor of Arts degree with a major in architecture, including studios at both the 300- and 400-levels, or the equivalent, are placed within the MArch 3 curriculum on the basis of their previous design studio experience and overall academic record.

The Graduate School of Architecture & Urban Design welcomes graduates of other schools with the undergraduate degrees in architecture (Bachelor of Science in Architecture) or the equivalent as candidates for the accredited professional Master of Architecture degree program (MArch 2). This curriculum typically spans four semesters.

Postgraduate programs, for students already possessing accredited professional degrees (Bachelor of Architecture or the equivalent), include the three-term MArch 1 degree curriculum or the Master of Urban Design degree program.

Master of Urban Design Degree

Students with a professional degree or the equivalent in architecture, urban planning or landscape architecture may apply for admission to the program leading to the Master of Urban Design degree. This degree is awarded upon completion of a three-term graduate curriculum devoted to urban design in metropolitan conditions.

Master of Landscape Architecture Degree

In the fall of 2010, the college and Graduate School of Architecture & Urban Design at Washington University in St. Louis launched a new graduate program in landscape architecture leading to a professional Master of Landscape Architecture (MLA). Two- and three-year degree options accommodate students with design and other undergraduate degrees. The landscape program further develops cross-disciplinary connections among architecture, urban design, and visual arts in the Sam Fox School of Design to grant MLAUD and MLA/MArch degrees.

This new program in landscape architecture focuses on the three subjects of design, ecology and urbanism. The transformative process of design — linking cultural, historical and technological investigations — forms the pedagogical basis for research. Ecology informs design practice to address a multiplicity of scales and natural systems within the environment. Urbanism serves as a terrain of contemporary landscape practice. As heirs to design, ecological and urban traditions, landscape architects are uniquely suited to articulate a spatial vision for today’s environment. This three-pronged approach is geared to develop the students’ critical and conceptual abilities, and prepare them to become leaders within professional and academic spheres.

The curriculum is centered on studio teaching supported by instruction in technology, history and theory. Following the core sequence of design studios and classes, students are encouraged to develop their own research interests through advanced design studios and electives. Interdisciplinary and international option studios foster a multiplicity of perspectives leading to a research-based degree project (thesis or independent study). In addition, students have opportunities to further their investigations within and beyond the school through teaching and research assistantships and scholarships.

The landscape architecture program draws on a unique set of institutional, regional and international resources available at the Sam Fox School. St. Louis functions as a laboratory for understanding and testing ecological and urban theories at the local scale, from brownfield reclamation to urban agriculture systems. Washington University’s outstanding programs in environmental studies, environmental engineering and American Culture Studies expand curricular offerings in ecology, technology and landscape studies, and the internationally renowned Missouri Botanical Garden serves as an exceptional tool of research and teaching. Finally, through the extensive international offerings of the school in Barcelona, Buenos Aires, Helsinki, Seoul and Tijuana, students experience different landscapes, cultures and cultures of practice.

Combined Degree Programs

The Graduate School of Architecture & Urban Design offers the following combined degree programs at the graduate level:

- Master of Architecture — Master of Urban Design
- Master of Architecture — Master of Business Administration
- Master of Architecture — Master of Social Work
- Master of Architecture — Master of Construction Management
- Cooperative 3+4 Program

Information on these combined degree programs can be obtained from the respective school’s Office of Graduate Admissions. In all cases, application must be made separately to each graduate or professional program.

Information and Applications

An application to the graduate programs should include a portfolio of student work in the visual arts (drawing, painting, sculpture, etc.) or architectural design work if the applicant has completed architectural design studio courses, along with a transcript or record from the institutions attended, and letters of recommendation. The Test of English as a Foreign Language (TOEFL) is required of international applicants along with verification of availability of funds.

For more information about graduate degree programs and requirements, contact the Director of Graduate Admissions, Graduate School of Architecture & Urban Design, Sam Fox School of Design & Visual Arts, Washington University in St. Louis, Campus Box 1079, One Brookings Drive, St. Louis, MO 63130-4899, or send e-mail to: samfoxschool@wustl.edu.
Phone: 314/935-6200
E-mail: wuarch@samfox.wustl.edu
Departmental website: http://samfoxschool.wustl.edu

Dean
Bruce Lindsey, AIA
E. Desmond Lee Professor for Community Collaboration
MFA, University of Utah
MArch, Yale University

Chair, Graduate Architecture
Heather Woofter
Associate Professor
MArch, Harvard University

Chair, Master of Urban Design Program
John Hoal
Associate Professor
PhD, Washington University

Chair, Master of Landscape Architecture Program
Rod Barnett
PhD, University of Auckland

Chair, Undergraduate Architecture
Igor Marjanovic
Associate Professor
MArch, University of Illinois at Chicago

Coordinator of Graduate International Programs
Adrian Luchini
Raymond E. Maritz Professor
MArch, Harvard University

Endowed Professors
Kathryn Dean
JoAnne Stolaroff Cotsen Professor
MArch, Oregon School of Architecture & Allied Arts

Paul Donnelly, FAIA
Rebecca and John Voyles Professor of Architecture
MS, Columbia University

Adrian Luchini
Raymond E. Maritz Professor of Architecture
MArch, Harvard University

Robert McCarver
Ruth & Norman Moore Professor
MArch, Columbia University

Eric Mumford
Rebecca and John Voyles Professor of Architecture
PhD, Princeton University

Professor
Stephen P. Leet
BArch, University of Kentucky

Associate Professors
Gia Daskalakis
Dipl de Postgrado, Universidad Politecnica de Cataluña

Robert Hansman
BFA, University of Kansas

Sung Ho Kim
MSci, Massachusetts Institute of Technology

Zeuler Lima
PhD, Universidade de São Paulo

Assistant Professors
Chandler Ahrens
MArch, University of California–Los Angeles

Catalina Freixas
Dipl Arch, Universidad de Buenos Aires

Patricia Heyda
MArch, Harvard University

Derek Hoeferlin
MArch, Tulane University

Seng Kuan
PhD, Harvard University

Natalie Yates
MLA, Louisiana State University

Affiliate Associate Professors
Jeffrey Berk
Dipl Arch, Universidad de Buenos Aires (Buenos Aires)

Gerardo Caballero
MArch, Washington University (Buenos Aires)

Gustavo Cardon
Dipl Arch, Universidad Nacional de Rosario, Argentina (Buenos Aires)

Fernando Williams
Dipl Arch, Universidad de Buenos Aires (Buenos Aires)

Senior Lecturers
Janet Baum
MArch, Harvard University
Philip Holden  
MArch, Washington University

Richard Janis  
MArch, Washington University

George Johannes  
MArch, Washington University

Don Koster  
MArch, Washington University

Gay Goldman Lorberbaum  
MArch, Washington University

R. Phillip Shinn  
BSE, Princeton University

Lindsey Stouffer  
MFA, Washington University

William Wischmeyer  
MArch, Washington University

Lecturers

Charles Brown  
MArch, Washington University

Kevin Le  
MArch, Washington University

Pablo Moyano  
MArch, Washington University

James J. Scott  
JD, Saint Louis University

Professors Emeriti

Iain A. Fraser
Gerald Gutenschwager
James Harris
Sheldon S. Helfman
Leslie J. Laskey
Donald Royse
Cari Safe
Thomas L. Thomson

Dean Emeritus

Constantine E. Michaelides  
FAIA

Full-Time Positions

Faculty members have nine- or 11-month full-time renewable appointments. These may be tenured or nontenured positions and are titled professor, associate professor and assistant professor of architecture.

Visiting Positions

Faculty members have full-time appointments for a limited period of time, usually no less than a semester and no more than one full academic year. These are nontenured positions and are titled visiting professor, visiting associate professor, visiting assistant professor of architecture and visiting architect.

Part-Time Positions

Faculty members, who usually are practicing architects, have less than full-time appointments. These individuals may teach as many as two courses each semester or as few as one course, one semester a year. These are nontenured positions and are titled affiliate professor, affiliate associate professor, affiliate assistant professor of architecture and lecturer.

The Major in Architecture

Bachelor of Design Degree

The major requirements for the Bachelor of Design degree, with a major in architecture, are as follows:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ARCH 311</td>
<td>Architectural Design I</td>
<td>6</td>
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<tr>
<td>ARCH 312</td>
<td>Architectural Design II</td>
<td>6</td>
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<tr>
<td>ARCH 3284</td>
<td>Architectural History II: Architecture Since 1880</td>
<td>3</td>
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<tr>
<td>ARCH 333</td>
<td>Case Studies in 20th-Century Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 346</td>
<td>Building Systems I</td>
<td>3</td>
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<tr>
<td>Capstone Course</td>
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<td>3</td>
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<tr>
<td>Electives</td>
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For additional information on current requirements, please visit the Degree Requirements page.

Bachelor of Science in Architecture Degree

The major requirements for the Bachelor of Science in Architecture degree are as follows:

<table>
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<tr>
<td>ARCH 312</td>
<td>Architectural Design II</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 411</td>
<td>Architectural Design III</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 412</td>
<td>Architectural Design IV</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 3284</td>
<td>Architectural History II: Architecture Since 1880</td>
<td>3</td>
</tr>
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<td>3</td>
</tr>
<tr>
<td>ARCH 346</td>
<td>Building Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 447A</td>
<td>Structures I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 448A</td>
<td>Structures II</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 438</td>
<td>Environmental Systems I</td>
<td>3</td>
</tr>
</tbody>
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and completion of at least one architectural elective from the following groups:
• Urban Issues Electives group, or
• Architectural History/Theory Electives group.

For additional information on current requirements, please visit the Degree Requirements page.

The Minor in Architectural History

Minor Degree Adviser: Seng Kuan, skuan@samfox.wustl.edu

The Minor in Architectural History is open to all students at Washington University in St. Louis, regardless of their major. Students interested in the minor should contact the designated Minor Degree Adviser.

Units required: 18* including:

6 units of architectural history survey:
- ARCH 3283 Architectural History I: Premodern Encounters in World Architecture 3
- ARCH 3284 Architectural History II: Architecture Since 1880 3

3 units of methodology course work:
- ARCH 4xx Theories and Methods of Historical Research 3

OR
- Another methodology-based course approved by the minor adviser 3

3 units of architectural history and theory electives (300-level or above):
- ARCH 3823 Rethinking Renaissance Visual Culture - Florence Summer Program 3
- ARCH 3xx Elective architectural history and theory courses approved by the minor adviser 3

*12 units must be in the minor only and cannot be double-counted toward another major or minor.

The Minor in Architecture

Minor Degree Adviser: Derek Hoeferlin, hoeferlin@wustl.edu

With a new curriculum in place, there will be changes in the minor. Please consult with the Associate Dean of Students for current requirements.

Units required: 18

Required courses:

6 units minimum of introductory design chosen from the following:
- ARCH 111 Introduction to Design Processes I 3
- ARCH 112 Introduction to Design Processes II 3

3 units minimum of history chosen from the following:
- ARCH 3283 Architectural History I: Premodern Encounters in World Architecture 3
- ARCH 3284 Architectural History II: Architecture Since 1880 3

Elective courses: 9 units chosen from the following:
- ARCH 211B Introduction to Design Processes III 4.5
- ARCH 212B Introduction to Design Processes IV 4.5
- ARCH 302 Freehand Drawing 3
- ARCH 333 Case Studies in 20th-Century Architecture 3

Other elective courses as approved by the Associate Dean

The Minor in Landscape Architecture

Minor Degree Advisers: Dorotheé Imbert (imbert@samfox.wustl.edu) and Natalie Yates (yates@samfox.wustl.edu)

The Minor in Landscape Architecture is for students who will be receiving either a Bachelor of Science in Architecture degree or a Bachelor of Arts degree with a Major in Architecture or a Bachelor of Design with a Major in Architecture. Students interested in the minor should contact the designated Minor Degree Advisers.

Units required: 18* including:

6 units of design course work:
- ARCH 312 Architectural Design II 6
  or ARCH 412 Architectural Design IV

3 units of history course work:
- LAND 570 Landscape Architecture: History & Theory I 3
- LAND 571 Landscape History II: Prehistory to 1850 3
- LAND 572 History of Regional and Urban Planning 3

Or other history/theory courses as approved by the minor adviser

3 units of natural systems course work:
- LAND 551 Principles of Ecology 3

Or other natural systems elective courses as approved by the minor adviser

6 units of landscape architecture electives:
- X10 307 Community Building, Building Community 3
- LAND 462 Landscape Materials 1.5
- LAND 480 Case, Trace, Displace: Dialogue between River and City 3
- LAND 573 Territorial Contexts 3

Or other elective courses in Landscape Architecture as approved by the minor adviser
*12 units must be in the minor only and cannot be double-counted toward another major or minor.

The Minor in Urban Design
Minor Degree Adviser: Patty Heyda, heyda@samfox.wustl.edu
The Minor in Urban Design is for students who will be receiving either a Bachelor of Science in Architecture degree or a Bachelor of Arts degree with a Major in Architecture or a Bachelor of Design with a Major in Architecture. Students interested in the minor should contact the designated Minor Degree Adviser.

Units required: 18* including:
6 units of foundational course work:
X10 307 Community Building, Building Community 3
ARCH 241 Community Dynamics 3

6 units of design course work:
ARCH 312 /ARCH 412 Urban Design Focused Studio (6 units)

6 units of advanced course work:
ARCH 654D Metropolitan Landscapes 3
ARCH 656 Metropolitan Urbanism 3
Or an approved MUD track elective 3

*12 units must be in the minor only and cannot be double-counted toward another major or minor.

Additional Information
Students should check the current course descriptions carefully to verify their eligibility to enroll in courses that have specific prerequisites.

X10 XCORE: Sam Fox foundation and commons courses
College of Art and College of Architecture majors will have enrollment priority in X10 courses.

Design & Visual Arts — Core (X10)

X10 XCORE 101 Drawing I
An introductory course which teaches students to recognize and manipulate fundamental elements of composition, line, form, space, modeling and color. Emphasis is placed on working accurately from observation, with an introduction to other methodologies. Students work in a variety of media. Demonstrations and illustrated lectures supplement studio sessions and outside projects.
Credit 3 units. EN: H

X10 XCORE 102 Drawing II
Continuing as an introductory course which teaches students to recognize and manipulate fundamental elements of composition, line, form, space, modeling and color. This course is an intensive studio course which builds on the perceptual and conceptual skills and experiences developed in Drawing I. A main objective will be to develop a higher level of critical and studio practice. Prerequisite: X10 XCORE 101.
Credit 3 units. EN: H

X10 XCORE 181 Practices in Architecture + Art + Design
This course offers first-year students in architecture and art an introduction to the subjects, theories and methodologies of the disciplines of art, design, architecture, landscape architecture, and urban studies. Examples, drawn from a range of historical periods as well as contemporary practice, highlight distinct processes of thinking and working in each discipline, as well as areas of intersection and overlap. Part 1 of 2.
Credit 1 unit. EN: H

X10 XCORE 182 Practices in Architecture + Art + Design
This course offers first-year students in architecture and art an introduction to the subjects, theories and methodologies of the disciplines of art, design, architecture, landscape architecture, and urban studies. Examples, drawn from a range of historical periods as well as contemporary practice, highlight distinct processes of thinking and working in each discipline, as well as areas of intersection and overlap. Part 2 of 2.
Credit 1 unit. EN: H

X10 XCORE 301 From Propaganda to Decoration
This is a studio course that is conceptually driven and anchored in the philosophical terrain of the print multiple. The fundamental attributes of the multiple, including its accessibility and repeatability, are from private to public and from political to aesthetic. Given this orientation, we examine the place where the public and private spheres meet. Considering urban communication and social space, reproduction and distribution, gifting and exchange, private practice and public intervention, this course uses the print multiple as a starting point to explore a continuum that runs from propaganda to decoration.
Credit 3 units. EN: H

X10 XCORE 303 Visualizing Information
This project-based studio course brings students from diverse backgrounds in Art, Architecture, and Design together to learn to compose information-rich surfaces. The course explores principles of information design on paper initially, and offers the opportunity to extend some applications to the screen. Course topics include content organization, visual structure, hierarchy, typography, color, sequencing, audience and usability. Students have the chance to select subject and media for some of their projects. Projects are supplemented with readings and lectures about contemporary information design, with some historical references. This course combines the rigor of a disciplinary classroom with the flexibility of a multidisciplinary one. Topics likely to emerge in the interdisciplinary conversation include information in three-dimensional spaces, communicating information with a particular voice or editorial perspective.
analytical versus poetic information design, function, audience and programming. All of these are supported, and students develop a set of tools which can be adapted to their own disciplinary work in a meaningful way.
Credit 3 units.

**X10 XCORE 304 Data Visualization**
In this hybrid lecture/studio course, students learn basic skills to develop data visualizations focusing on clarity, relevance to the user, and visual expression. The course spans several themes within data visualization, including principles of two-dimensional design, storytelling and sequence, and interactivity and user navigation. It is organized into four units, each with a different content focus and data type, including topics as diverse as urban and rural landscapes, conditions in public health, and literary production. Students apply their own areas of interdisciplinary expertise to the final project. Students need a laptop with Adobe Illustrator and may need to acquire inexpensive or free software. This course is appropriate for sophomores through graduate students with or without visual training who are interested in data, information design, user interface, and computer programming. Course counts as a multidisciplinary course in the Sam Fox Commons, an elective course in Communication Design, or a course in the Interdisciplinary Project in the Humanities (IPH).
Credit 3 units. EN: H

**X10 XCORE 305 Topics in Visual Culture: Commercial Modernism in America, 1865–1965**
This survey course explores contributions to and expressions of visual modernism within the commercial tradition in the United States. Lectures, readings and screenings engage the intertwined histories of commerce, technology, society and aesthetics. Topics include periodical illustration from Harper's Weekly to the Ladies Home Journal, the newspaper comic strip and the comic book, animation from vaudeville to television, and science fiction and transportation design. Context provided by the advent of industrial image production; modernist art theory and high cultural disdain for mass markets (with resulting effects on the academy); avant-garde and commercial cross-pollination; the social histories of ethnic depiction (i.e. blackface minstrelsy); consideration of women as consumers and producers of commercial images. Students make use of materials in the collections of the Modern Graphics History Library at Washington University. Three animation screenings are required. Attendance at these screenings is required.
Credit 3 units. EN: H

**X10 XCORE 306 Commercial Modernism in America 1865–1965**
Credit 3 units. EN: H

**X10 XCORE 307 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 (or areas), each trip highlighting some theme or issue related to the built environment (architecture, planning, American history, investment and disinvestment, community character and values, race, transportation, immigrant communities, future visions, etc.). Running parallel to this, students are involved in an ongoing relationship with one particular struggling neighborhood, in which students attend community meetings and get to know and become involved with the people in the community in a variety of ways. Students learn to look below the surface, beyond the single obvious story, for multiple stories, discovering their 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.
Credit 3 units. EN: H

**X10 XCORE 309 Convergences: Studies in Art & Architecture**
This interdisciplinary course examines the convergence of artistic and architectural ideas, techniques, and practices through selected historical and contemporary studies. Emphases range from the figure of the artist/architect (Michelangelo and Leonardo, for example, to Le Corbusier and Libeskind), to critical reflections (Vasari, Gennough, Serra) to boundary-crossing practices (Whiteread, Webster, Irwin, Kin, Judd, Miss) to collaborations and collaborative works (Ando/Kelly/Serra and the Pulitzer Foundation). The course emphasizes empathy and productive work across artistic disciplines. Field trips to the Pulitzer Foundation for the Arts (St. Louis) and the Chinati Foundation (Marfa, Texas) are planned.
Credit 3 units.

**X10 XCORE 311 Materials & Mechanisms: Site Specific Design Installation**
In this course students are guided to explore the nature of materials and simple mechanisms (mechanically driven kinetics) in the making of art and/or utilitarian objects. This course investigates the qualities of materials and how they might be used thoughtfully to develop a conceptual and physical experience for an audience or user. Specific materials are assigned, at times, yet students have the opportunity to self-select materials based on project needs. Throughout the semester, students balance designing with finding — the process of playfully exploring materials and methods without preconception of a final resolution. Looking for possibilities can lead to unexpected discoveries.
X10 XCORE 313A Creative Practice and Natural Systems: An Ecology of Art

In this studio course, students learn to use basic ecological principles as a lens through which to investigate and evaluate productive, meaningful and sustainable creative practices. Ecology is community-focused, involving the study of relationships with a given community. It establishes a model by which students can establish a more complete understanding of the inspirations, expectations and ramifications of creative practice. We visit local gardens, parks, farms and neighborhoods while seeking to understand the complexity of our own role in nature and culture. This diverse range of ecological engagement allows for a broad array of creative applications in the studio arts, design and architecture. The class format challenges students with new ways of thinking while allowing them to select materials, specific topics of study, and methods of engagement appropriate to their own developing interests. The course consists of fieldwork, readings and lectures, the content of which is examined through individual and collaborative projects. At midterm students identify opportunities for focused research and production, and the course culminates with the public presentation of this work. College of Architecture and College of Art sophomores have priority. Fulfills Sam Fox Commons requirement.
Credit 3 units.

X10 XCORE 315 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.

X10 XCORE 317 Furniture Design

The seat is an intimate interface between the building and the body. It embodies a complex set of structural conditions, material opportunities and possibilities for expression. Architects, artists and industrial designers covet opportunities to make the chair. The result is that seemingly infinite perfect solutions exist — and still the seat remains a provocative challenge. In this course students design and build a chair. Emergent technologies are combined with traditional techniques of metal fabrication, woodworking and plastic forming in the design and making of the work. The course objective is for students to learn how to work directly with machinery and materials in the realization of their design. It is expected that students will have basic shop skills addressed in course prerequisites. Advanced techniques are introduced in this course and students select those most appropriate to their work to build upon. There is a great deal of independent investigation required to excel in this course.

Students propose ideas and then develop them using drawings, models and mock-ups in order to realize the best potential for their design.
Credit 3 units.

X10 XCORE 319 Digital Fabrications: A Primer Course in the Use of Computer Modeling for Art & Design

This course focuses 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 introduces students to 3-D software with a focus on 2-D, 3-D, and physical output. Through a series of projects, students learn to generate work directly from the computer and translate it into different types of output. Starting from first principles, the course covers the basics from interface to output for each platform used. The course also familiarizes students with a range of CNC technology and other digital output for both small- and large-scale fabrication. The course is broken into three projects. In the first, students focus on computer-generated geometry and control systems. In the second, students generate physical output and line drawings. The final project focuses on rendering, context and cinematic effects. The software covered includes, but is not limited to, Rhinoceros 3-D, Maya, Illustrator and Photoshop. Additionally, students use the 3-D printer, laser cutter and/or other digital output tools.
Credit 3 units. EN: H

X10 XCORE 321 Mapping Soft Bodies

This course develops digital design skills with conceptual understanding of the transformative process of artistic production. Mapping Soft Bodies investigates artificial objects and industrial products as a basis for inspiration. Through digital modeling and scanning the human body, each student develops a transformation process that analyzes the social and cultural conditions of a new emerging design. New body armatures are modeled through CAD/CAM (laser cutting) and Rapid Prototyping (3-D printing) for physical outputs. The course is for students who are interested in emerging technologies and digital production. This course is for students interested in design, sculpture, architecture and digital media by enhancing 3-D technologies and allows each student to develop abstract thinking and making processes.
Credit 3 units. EN: H

X10 XCORE 325 Global Discourses in Art & Architecture

This course examines art, architecture and urbanism from the perspective of global production, dissemination and reception. It focuses on the global exchange of people and ideas as
one of the main vehicles of visual culture, both historical and contemporary. Through a series of focused case studies, the course probes inherent dichotomies within art and architecture driven by their site-specificity, yet also by their constant global displacement across various disciplinary, cultural and geographical boundaries. The course content includes lectures, discussion sessions, readings and textual and visual projects that examine cross-cultural aspects of art and architecture.

*Enrollment limit will be set at zero and students will be enrolled from the waitlist. The course is offered as part of the University-wide Global Certificate and is open to all students at Washington University regardless of their major field of study. Sam Fox School sophomores will have priority.

Credit 3 units.

**X10 XCORE 327 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.

Credit 3 units.

**X10 XCORE 330 Cell Phones, Snapshots and the Social Network**
This course is designed around the cell phone camera as a means of art production using blogs, interactive websites, social networking and mass distribution of digital images and videos. Students explore the art-making potential of the cell phone camera as a snapshot camera of the modern age. Students post daily images/videos on blogs and other social media sites. Readings and discussion topics include the culture and aesthetic of the snapshot, the vernacular image, and the role of social networks in image production and distribution. Students are required to design and maintain at least two social networking sites and to supply a cell phone with the ability to upload images to the Internet.

Credit 3 units. EN: H

**X10 XCORE 332 Metabolic City: Spaces of Bodily and Environmental Wellness**
Metabolic City probes bodily and environmental wellness as intertwined cultural, social, and technological constructs. From the British Archigram Group, to the Japanese Metabolists and the Dutch artist Constant, a number of visionary projects in the 1960s re-imagined our notion of the body, city and the environment. By means of individual and collective gadgets, tools and spaces they bridged the scales of the body and the city, weaving together issues of bodily and environmental performance. Through a combination of texts, discussions and projects, the course engages in a delayed conversation with these projects, proposing the concept of “metabolism” both as a bodily function, but also as an environmental mechanism that operates on a global scale. Some of the key concepts discussed in the class include global citizenry, urban imagination, networks, performance, virus, urban protest and insurgence. The course fulfills the Sam Fox Commons Course requirement and the architectural history/theory elective requirement and is also open to all Washington University students through the Global Certificate.

Credit 3 units.

**X10 XCORE 336 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.

Credit 3 units.

**X10 XCORE 338 Shifting from Lines to Surfaces/Virtual to Empirical**
Digital Media Design: Introduction to Exploring Digital and CAD/CAM Technology. This is a course in computing theory and techniques on 2-dimensional digital software and advanced 3-dimensional modeling software. Weekly demonstrations on software operations and individual projects are developed. This course bridges the gap between 2-D computational tools that define lines and the 3-D tools that develop complex surfaces. These surfaces explore the possibilities of creating and articulating the non-linear geometries manipulated on the digital environment. The final project consists of 2-dimensional
drawings, digital models, and physical models produced by advanced CAD/CAM technology. By employing alternative techniques and emerging technologies of manufacturing, new forms of objects and perceptions will re-define multiple design processes.
Credit 3 units. EN: H

X10 XCORE 342 Florence Commons
This is a required course for all students in the Florence Study Abroad Program. Content for the course fosters the idea of collaboration, approaching how art, architecture, urbanism and design are related in Italian visual and material culture. All faculty work together to establish a shared semester theme and media and conduct collective introductory activities and reviews, as well as combined field trips. The instructor determines a specific approach to these shared goals. This framework allows for both cross-disciplinary work and increased breadth and focus regarding their semester study topics, a format that is unique to the undergraduate Florence Program. Students will be enrolled by the registrar in a section that best suits their area of study.
Credit 3 units. EN: H

X10 XCORE 344 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 will 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.
Credit 3 units. EN: H

X10 XCORE 345 Shopping
This seminar examines shopping as a social and cultural construct that operates at several levels in relation to art, architecture and urban planning. Shopping is the fundamental activity of the capitalist marketplace. It is also inextricably linked with major aspects of public and foreign policy, where national consumerism is closely linked to global tourism, and it is at the core of economic development. Shopping is, as well, a common denominator of popular culture, frequently satirized in contemporary art, film and literature. Participants in the seminar read selections from various writings about shopping and the marketplace. We also view several films examining the shopping environment in narratives of power and desire. Prerequisite is completion of Sam Fox foundations year. Open to sophomores and above.
Credit 3 units.

Architecture

A46 ARCH 211B Introduction to Design Processes III
Introduction to Design Processes III engages design through the lens of perception investigating the relationship between materiality and inhabitable space situated in a natural context. Prerequisites: Successful completion of ARCH 111 and 112 with a grade of C- or better; or successful completion of ARCH 210, with a grade of C- or better.
Credit 4.5 units.

A46 ARCH 212B Introduction to Design Processes IV
Studio which initiates architectural and building issues such as: building analysis, structure, organization systems, and programming. Prerequisites: Successful completion of ARCH 211B with a grade of C- or better.
Credit 4.5 units.

A46 ARCH 111 Introduction to Design Processes I
This introductory architectural design studio engages the basic principles of architectural context, composition and experience. Through various fieldwork strategies, students explore architectural context through observation, analysis and invention. The site-specific design processes bridge two-dimensional and three-dimensional work, including drawing, drafting and making. The experiential qualities of architecture are introduced through basic considerations of scale and human interaction. The course work includes studio, work, lectures, presentations by students, readings, writing assignments and field trips.
Credit 3 units.

A46 ARCH 112 Introduction to Design Processes II
This core design studio engages the basic principles of architectural design through iterative processes of drawing and making, using a variety of tools, media and processes. The course work includes studio work, lectures, student presentations and local field trips. Prerequisite: A grade of C– or better in Arch 111 or coregistration in Arch 111.
Credit 3 units.

A46 ARCH 121 Community Building, Building Community
(Hewlett Program)
Credit 3 units.
A46 ARCH 209 Design Process
Open to Engineering, Arts & Sciences, Business and Art students at all levels. This studio course engages students in the process of design with an emphasis on creative thinking. Course content relates directly to the interests of engineers as well as arts and science, business and art students who wish to problem solve about positively shaping the texture and quality of the built world. A series of 2-D and 3-D hands-on problem-solving projects introduce students to design concepts as they apply to site (ecosystems and outdoor places), to humanistic place making (personal and small public spaces), to structure and 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 are informal group and individual discussions of each person’s stages in inquiry. The investigations take the form of study models made of recycled materials. Guest lecturers participate throughout the semester. The concluding project for the semester allows each student to work with their unique academic and personal interests, utilizing the process of lateral thinking.
Credit 3 units. EN: H

A46 ARCH 210 Introduction to Design
A lecture/studio course for students not majoring in design. Lectures on creativity, general issues in design and architecture. Studio work providing hands on exploration of two-dimensional and three-dimensional design ideas related to the lectures as well as discussions of assigned readings. Aimed at providing a broad view of design and the role of the designer. Class meetings for one hour of lecture and three hours of studio discussion each week.
Credit 3 units. EN: H

A46 ARCH 241 Community Dynamics
Credit 3 units.

A46 ARCH 2661 Semester Abroad Program Seminar
This course prepares students participating in the College of Architecture’s Spring Semester Abroad Program in Florence, Italy. The seminar meets eight times over the course of the semester. Attendance is required.
Credit 1 unit.

A46 ARCH 275 Service Learning Course: Environmental Issues
Credit 2 units.

A46 ARCH 302A Advanced Freehand Drawing
Application of the principles presented in ARCH 302 to more ambitious and individualized work. Work can include drawing, color, painting, printmaking, etc. The final target is a suite of independent works that explores a chosen medium or subject and that could constitute a small one-person show, but exploration and growth are given precedence over production. Weekly/bi-weekly critiques. Prerequisite: ARCH 302 or equivalent previous studies.
Credit 3 units.

A46 ARCH 302B Advanced Freehand Drawing (and Painting)
Credit 3 units.

A46 ARCH 303A Drawing on the City
Credit 3 units.

A46 ARCH 308A Digital Fabrications
Credit 3 units.

A46 ARCH 309 Special Topics: Photography for Architecture Students
The scope of this course is to offer both a technical and theoretical understanding of architectural photography. The course also emphasizes 4x5 view camera skill, use of DSLR and digital input, studio lighting as related to model reproduction, discussion of work, and development of individual projects. Students must provide a digital camera.
Same as ART 309
Credit 3 units. EN: H

A46 ARCH 310 Photography for Architecture Students
Same as ART 310
Credit 3 units. EN: H

A46 ARCH 311 Architectural Design I
Prerequisite: Arch 212 with a grade of C– or better. There is a required weekend, out-of-town field trip.
Credit 6 units.

A46 ARCH 312 Architectural Design II
CBTL course. Prerequisite: satisfactory completion of Arch 311.
Credit 6 units.

A46 ARCH 312A Architectural Design II (Study Abroad)
Prerequisite: Satisfactory completion of Arch 311.
Credit 6 units.

A46 ARCH 317 Architectural Design I (MArch 3)
The first of a three-semester sequence that introduces students to architectural design, focusing on conceptual, theoretical and tectonic principles. First-semester MArch 3 students only.
A46 ARCH 3283 Architectural History I: Premodern Encounters in World Architecture

This course explores the history of architecture from its origins until the beginnings of the modern period from a global perspective, focusing on patterns of interaction and exchange between and within both elite and vernacular building cultures. Using selected examples from Eurasia, sub-Saharan Africa and the Americas, the course traces the major elements of change and development in the design of the earth’s built environment, including technologies and materials, typology, the organization of labor and capital systems to the profession and the public. Course requirements include a mid-term, final exam and research paper.

A46 ARCH 318 Architectural Design II (MArch 3)

The second of a three-semester sequence of design studios. Continues examination of issues raised in ARCH 317. Second-semester MArch 3 students only. Credit 6 units.

A46 ARCH 323A Architectural Representation I (MArch 3)

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

Credit 3 units.

A46 ARCH 333 Case Studies in 20th-Century Architecture

Through a series of analytical, critical and interpretative studies of singular works of architecture in the 20th century, this course focuses on the manifold processes and contexts of their production. Each work is examined as a physical and cultural artifact with precise formal, intellectual and ideological intentions and meanings. The architectural object, understood as a synthesis of multiple criteria and frameworks, is explored from its conception through its realization based on certain principles (fundamental precepts of the discipline of architecture) and a broad range of concepts (abstract ideas understood as the products of speculative and reflective thought). Credit 3 units.

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. Biomimicy: 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 his or her 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 339 Concepts and Principles of Architecture I

This weekly seminar course addresses issues of Western architectural thought through a focused series of readings and discussions. The necessity and role of architectural theory in general is examined. Issues of tectonics, historicism, typology, regionalism, modernism, postmodernism and other critical frameworks for the consideration of architecture are thematic subjects of discussion. Selected readings include Vitruvius, Alberti, Laugier, Semper, Ruskin, Le Corbusier, Gropius, Kahn, Rossi, Venturi, Eisenman, Libeskind and Koolhaas. Weekly reading assignments, attendance, participation, one summary and discussion introduction based on a reading topic, final paper. Required for first-semester MArch 3 students. Fulfills history/theory elective for MA2rch 2 students.

Credit 3 units.

A46 ARCH 346 Building Systems I

The first of a two-course building systems sequence. The course progresses from a survey of the physical and structural properties of building materials through an analysis of building assemblies and systems. Structural systems are examined relative to their performance characteristics and issues related to manufacturing and construction. Structural systems in wood, steel and concrete along with masonry systems are reviewed in this class. Additionally, the primary and secondary performance characteristics of enclosure systems are identified and analyzed in this course. This course also covers the design of egress systems and vertical transportation systems in buildings.

Though the course focuses primarily on the underlying principles associated with these building systems, industry standards and building code requirements are an integral part of the review.

Credit 3 units.

A46 ARCH 347 Building Systems II

Building Systems II is a lecture/workshop course. It is the capstone course in the technology sequence. This course is a series of lectures related to technical theory, an analysis of technical precedent, and an integration exercise. The lectures focus on structure and enclosure systems, active and passive climate control systems, natural and artificial lighting systems, mechanical and electrical services for buildings. The lectures take place over the course of the semester. During the first half of the course, students conduct the analysis of technical precedent in architecture exercise. Technical precedents are analyzed relative to their performance characteristics and their relationship to other technologies in the building. During the second half of the semester, students conduct an integration exercise. Technical systems are selected based on architectural issues, performance characteristics and systems integration.

Credit 3 units.

A46 ARCH 347A Building Systems II

Credit 3 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: (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 2-D and 3-D 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 seeking advice of faculty from a specific discipline, through the semester in the preparation of their evolving curricular plan. During the last two thirds of the semester, WU students are on-site during the Compton-Drew school day, once a week on each Monday from noon to 1:30 p.m. to teach small group workshops for some of
A46 ARCH 363 Architectural Photography
This course offers a technical and theoretical understanding of architectural photography. Basic operation and orientation of digital and analog cameras are covered, as well as best practices for photographing interior and exterior spaces with both natural and artificial lighting. Students learn how to document artwork and architectural models/structures for portfolio presentation purposes, preparing them for working relationships with professional photographers in the industry. This course emphasizes 4x5 view camera skill, use of DSLR and digital input, studio lighting, and development of individual projects. Digital camera required; 4x5 camera provided by photography department.

Credit 3 units.

A46 ARCH 375B STL City Studio Programming: Understanding, Engaging and Organizing Columbus Square Citizenry
This class dedicates itself to designing programs for future community projects in the Columbus Square neighborhood. Programming occurs organically through understanding, engaging and organizing the neighborhood. These projects are cross-disciplinary, not limited to any particular practice or discipline. They are realized in future semesters (or in certain cases, this semester) through the support of STL City Studio. The class builds on relationships established during last year's City Studio design/build project, Learning Landscapes at Patrick Henry Elementary School, a series of gardens at the center of the neighborhood. To define and develop projects, we use narrative to clarify both our own values and the values of the neighborhood. Students regularly visit Columbus Square and its adjacencies, particularly Downtown St. Louis, uncovering visible and invisible stories. We listen to what residents, officials, experts and planners have to tell us about the place and what the place could become. Throughout the semester, students present their findings through narratives, diagrams and other representations. Projects emerge out of this collaborative, narrative-based process. All students, from any discipline or at any level, may take this class.

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.

A46 ARCH 394 New Topic (Sam Fox School)
Same as ART 394
Credit 3 units. EN: H

A46 ARCH 401B Color in Architecture, Design and Art
Credit 3 units.

A46 ARCH 402A Measured Representation
Credit 3 units.

A46 ARCH 402C Advanced Freehand Drawing II
Credit 3 units.

A46 ARCH 403 Sustainable Design
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 embodied 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;
entrepreneurial process. Students work to develop skills and explain the resources required to meet specific goals. This sustainability plan that demonstrates the value of the proposal of culturally significant, creative work that also supports a not-for-profit organizations that are involved in the production opportunities. Students are encouraged to bring ideas that have 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 405A Furniture Design for the Architect Students design and fabricate furniture. The box and chair are used as vehicles to study historic examples of furniture design, structure, fabrications and finishing techniques. Other issues that are addressed are: material awareness and craftsmanship. Evaluation of the final products is based on design, structure, craftsmanship, material use, beauty and finish. Credit 3 units.

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 405F Furniture Design (Study Abroad)

Credit 3 units.

A46 ARCH 405G Furniture Design in Finland

Credit 3 units.

A46 ARCH 406J Woodworking

The content of this workshop is woodworking technique and appropriate design for this material. Credit 1 unit.

A46 ARCH 406L Perspective Drawing

A study in perspective drawing methods, using the traditional construction methods as a starting point, and then exploring alternative approaches. The fundamentals of one-point and two-point are covered along with rendering techniques for formal and informal representations. A variety of rendering techniques are presented depending on situation of design and time allowed. Credit 1 unit.
A46 ARCH 406M Mold-Making and Casting
Credit 1 unit.

A46 ARCH 406N GIS Workshop
Credit 1 unit.

A46 ARCH 406P 3-D Digital Tools for Studio
Credit 1 unit.

A46 ARCH 406R Model Making
Credit 1 unit.

A46 ARCH 406S Real Estate Workshop
Credit 1 unit.

A46 ARCH 406W Simple Book Structures
Students investigate the form of the visual book through construction of several different book structures, among them the accordion, the flag book, the tunnel, simplified case binding and a portfolio case. This class investigates the organization of the visual book through the sequencing of images and the structure of the book as a reflection of content. It is hoped that the class permits the student to pursue new approaches to presenting visual information in book form.
Credit 1 unit.

A46 ARCH 406Y The Diagram
The purpose of this workshop is to fully understand how we can exploit the concept and method of the diagram in order to better access ideas, reveal themes, discover underlying processes and relationships, and ultimately, to better represent our final design intentions. The goal of the workshop is to understand the position of the diagram in the architectural design process by looking at examples of architect’s drawings/other diagrams; to understand what diagrams can mean, and specifically how to use them in design; to test methods of drawing and diagramming through a series of targeted exercises; and to be able to further exploit ideas and designs through their representation — skills for the larger context of the architecture studio and for future analyses.
Credit 1 unit.

A46 ARCH 406Z Vertical and Horizontal Structures
Designing with advanced digital modeling and CAD cam output through laser cutting and CNC milling. Students develop complex structural systems through virtual design tools and translate them into physical objects that can be programmed for human interaction.
Credit 1 unit.

A46 ARCH 408A Digital Visualization Workshop: 2-D Representation
This workshop is an introduction to basic Auto CAD drawing layout and organization with printing process. The workshop introduces students to importing and exporting into other graphic softwares (Photoshop and Illustrator) allowing a basic understanding of resolution and line types with articulated graphic awareness to develop complex 2-D drawing capabilities. Required for all 317-level MArch 3 students, who are given priority in enrolling. Open to all other architecture students as space allows.
Credit 1 unit.

A46 ARCH 408B Digital Visualization Workshop: Advanced 3-D Modeling
Credit 1 unit.

A46 ARCH 408C Digital Visualization Workshop: Advanced Rendering
This workshop is an introduction to complex digital rendering in Rhino 4.0 with plug-ins Flamingo, VRay, Maxwell and Fry Rendering Engines. These skills are needed for sophisticated rendering outputs for more hyper-real visualization. The workshop introduces students to material, lighting, camera and global illumination processes. This workshop is required for all MArch students at the 419 level, who are given priority for registration in this course. Open to other upper-level undergraduate and graduate architecture students as space allows.
Credit 1 unit.

A46 ARCH 408D BIM 101 Workshop
Credit 1 unit.

A46 ARCH 408H #technology.today.tomorrow
The design industry is changing and the need to understand this change is critical. Before students graduate, they should make themselves aware of the way technology is impacting the process of delivering projects today and tomorrow. This evening workshop exposes students to various technologies within different parts of the building industry. We review technology used in design and construction with special guests, from leaders in the industry demonstrating how they are using these tools today. We explore technology on the horizon and hear from those developing tools for the future. This workshop is not meant to be a software instruction class, but more of a window into the profession. #BIM #technology #future #AEC #design #construction #cloud #knowledge #parametric #computation #collaboration.
Credit 1 unit.
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, 2-D representation, 3-D modeling and animation rendering throughout the course, both as general workshops and individual project basis. Credit 3 units.

A46 ARCH 409B Material Drawings, Unforeseen Drawings, Expanding Drawings
Credit 1 unit.

A46 ARCH 409C Watercolor Painting for Architects, Urban Designers and Landscape Architects
Credit 3 units.

A46 ARCH 4102 Lively City: Behavioral Studies & Public Space Design
Credit 1 unit.

A46 ARCH 410D Printmaking
Credit 1 unit.

A46 ARCH 410W Perspective E: Architectural Education and the Public Good
This discussion-based course explores Perspective E of the Five Perspectives from the National Architecture Accreditation Board’s Conditions for Accreditation: Architecture Education and the Public Good. Changing the perspective into a question, [What does it mean] “to be active, engaged citizens; to be responsive to the needs of a changing world; to acquire the knowledge needed to address pressing environmental, social and economic challenges through design,” … provides the context for a series of discussions. Discussions include student presentations of case studies in education and practice as well as speculation about how this perspective might be met within the Graduate School of Architecture, Landscape and Urban Design. Credit 1 unit.

A46 ARCH 410X Special Topics Workshop
Credit 1 unit.

A46 ARCH 411 Architectural Design III
Prerequisite: satisfactory completion of Arch 312. Credit 6 units.

A46 ARCH 412 Architectural Design IV
CBTL course. Prerequisite: satisfactory completion of Arch 411. Credit 6 units.

A46 ARCH 418P Realizing: Pulitzer Foundation for the Arts
A transdiscipline, material-based workshop providing insight into the process, dedication and collaboration required to realize a signature work of architecture. Design, construction and management team representatives serve as primary sources. Construction of an architectural concrete wall-corner is central to the workshop effort. Attendance and involvement with the associated spring Colloquia is required. Working in conjunction with the Pulitzer Foundation for the Arts, the workshop includes two types of instruction: active participation and topic discourse. A colloquium celebrating the 10-year anniversary of the Pulitzer Foundation’s opening divide the workshop’s calendar and the two instruction types. An investigation and thorough understanding of the Pulitzer Foundation for the Arts initiates the workshop, followed by the planning, construction and placement of an architectural concrete wall. Required participation in the semester’s Lecture Series includes compiling question/answer responses related to profession feedback. The workshop endeavors to provide each student with a sound understanding of current practice methods involving design team, project delivery and material investigation/application. Instruction methods consist of readings, discussions, expert commentary, hands-on construction and site visits. A materials fee is required. Enrollment is limited. Credit 1 unit.

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 421J Building a Better World: Architecture and Social Reform in America
Architects, planners and social reformers have addressed urban issues of poverty, crime, delinquency, labor unrest and class and ethnic tensions through activist models of the public library and school, the YMCA, the playground and the model home — or by a retreat from the city in the form of utopian settlements. This seminar examines the history of environmentalist thinking and social reform in the United States and to some extent, Europe,
from the Enlightenment to World War II, including the work of Andrew Jackson Downing, Frederick Law Olmstead, Ernest Flagg and Frank Lloyd Wright and critics such as Jane Jacobs and Prince Charles. The class becomes familiar with reform architecture and its context and assesses the effectiveness of this strategy as a solution to social problems. Open to graduate and upper-level undergraduate students. Fulfills history/theory requirement.
Credit 3 units.

A46 ARCH 421K Modern vs. American: Rethinking the Architectural Relationship
What is American about American architecture? Architects, historians and theorists have asked this question throughout our nation’s history, but it gains renewed importance in this age of globalization. Can we, should we, continue to apply national labels to our architecture? This seminar examines the architectural culture of the United States in the 20th century, with special attention to the relationship between national identity and the internationalizing forces of modernity, particularly European modernism. Through analysis of theoretical writings, developments in education and practice, and key projects such as the Chicago Tribune Tower Competition, the Illinois Institute of Technology and U.S. embassies around the world, students gain insight into the dynamic between the local and the global in the design of the built environment. Course requirements include in-class presentations, field trips and a substantial research paper. Fulfills history/theory elective requirement.
Credit 3 units.

A46 ARCH 421P Marina City: Bertrand Goldberg and the Aura of Chicago Modernism
Credit 3 units.

A46 ARCH 421R Gender, Race and Architecture in the American City, 1865–1960
Credit 3 units.

A46 ARCH 421S American and International Urbanism
This advanced history and urban issues seminar explores the history of urbanism as it developed in the United States in the late 19th and early 20th centuries and trace some of its international outcomes. We examine changing theories of how urban environments should be shaped, placing efforts by designers to transform the built environment within the context of major social, cultural and political changes. These include public urban parks and parkways, City Beautiful neo-Classical urban environments, regional planning, auto-based planned communities and shopping centers, high-rise hotels, theme parks, and megastructural airports. We explore the relationships between the built environment, social change, political struggle and design theory. We, in addition, track the establishment, professionalization, growth and contests over the fields of architecture, landscape architecture, urban planning and design. We pay close attention to shifting conceptions of, conflicts over, definitions of the urban public, the boundaries of the “public sphere,” the relationship between public and private spaces, and the role of government in shaping and policing the urban landscape. By using historical methods to analyze documentary evidence, the course facilitates greater understanding of the complexity and layering of the urban landscape and critical urban design and landscape practices. Fulfills History/Theory and Urban Issues elective requirements.
Credit 3 units.

A46 ARCH 421T Urbanism: Cambridge MA
Credit 3 units.

A46 ARCH 422G GIS for Site Design
This course module introduces GIS mapping software and its application to methods used in site planning and design. The focus of this half-semester course is to understand the potential of GIS to analyze, visualize and utilize complex data. Students learn techniques and tools in ArcGIS software and explore how these can be applied to projects specific to individual sites. This course introduces new skills and analytical complexity while building upon previously learned representation techniques. Same as LAND 422
Credit 1.5 units.

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 425D Meso-American Architecture
Credit 3 units.

A46 ARCH 426F Discover Latin America: Literature, Culture and Cinema
Credit 3 units.

A46 ARCH 426G Latin American Literature
Credit 3 units.

A46 ARCH 4280 Architectural History I: Antiquity to Baroque
This lecture course introduces major historical narratives, themes, sites and architects from ancient Greece to the end
of the Baroque period. We take an extended look at the dawn of the modern period in 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 is pulled together around the themes of (1) classicism and its subsequent reinterpretations, and (2) 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 also pay close attention to major sites of landscape and urban-scale work. Requirements include a mid-term, final exam and a series of short papers.

Credit 3 units.

A46 ARCH 4284 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 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. This course is required for all MArch 3 students.
Credit 3 units.

A46 ARCH 4285 Architectural History I: Premodern Encounters in World Architecture
This course explores the history of architecture from its origins until the beginnings of the modern period from a global perspective, focusing on patterns of interaction and exchange between and within both elite and vernacular building cultures. Using selected examples from Eurasia, sub-Saharan Africa and the Americas, the course traces the major elements of change and development in the design on the earth’s built environment including technologies and materials, typology, the organization of labor and capital systems, and the codification and transmission of architectural knowledge and symbolism to the profession and the public. Course requirements include a mid-term, final exam and research paper.
Credit 3 units.

A46 ARCH 4286 Architectural History I: Antiquity to the Enlightenment
This course addresses the development of architecture and urbanism from Greco-Roman antiquity to the European Enlightenment, while also paying close attention to contemporary developments in the non-Western world, especially in the Islamic world and East Asia. The course’s objective is to set the stage for major ideological pursuits of modern architecture as they developed in the 19th and 20th centuries, examining how these ideas evolved out of longer-term historical processes. We focus on issues of classicism, tectonic culture and historicity, and discuss commonalities and differences toward them across time and cultures in the premodern world.
Credit 3 units.

A46 ARCH 430 The Design of Practice in America
Credit 3 units.

A46 ARCH 430A Special Topics
Credit 3 units.

A46 ARCH 430B Special Topics
Credit 3 units.

A46 ARCH 430D Special Topics: Beyond Words, Beyond Images: Representation After History
Same as ART 430D
Credit 3 units. EN: H

A46 ARCH 434L Materials Study: History, Technology and Design
Credit 3 units.

A46 ARCH 434M Materials Research Seminar
Credit 3 units.

A46 ARCH 434N Materials Research Seminar
Credit 3 units.

A46 ARCH 434P Materials Research Seminar
Credit 3 units.

A46 ARCH 434Q Materials Research Seminar
Credit 3 units.

A46 ARCH 434R Decoding Sustainability
This course engages worldwide conversations regarding current global environmental issues in relation to the production of building materials. Students begin by defining dilemmas faced by designers and architects in the selection of materials, followed by introductory information on biomimicry, natural capitalism, true cost and lifecycle analysis. This course then looks at national, international and industry environmental standards that govern building materials with respect to the triple bottom line: environmental impact, economic impact and social equity. By
analyzing specific “certified” building materials, students see how much or how little is being measured and how transparent the certification processes are. Building materials and the environmental standards that govern them will continue to evolve throughout the entirety of a designer’s life. Therefore, developing a thinking/filtering process to employ in the selection aids each designer in his or her career. This course seeks to develop design thinking in relation to the environment while developing tools to understand how building materials can be evaluated for sustainability.
Credit 3 units.

A46 ARCH 435C Site Works
Credit 3 units.

A46 ARCH 435D Surface It, With Pieces
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 a specific application; pavers. The students design a module and then explore different pattern options. The pattern modules consider the limitations of the material in terms of strength, weight, size, etc. The goal is to make a single piece or pieces that can be lifted by a single person without much effort and combine them in different ways in order to create an artificial topography. Students learn about the material itself as well as the act of construction, assemblage and mass production, which include methods and technology, ranging from tools to form work. The forms for the concrete pieces are built through a process of CNC milling and/or vacuum-formed plastic. The challenge is 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 for this class. Students also are asked to investigate water run-off in a given area and alter the percentage of open grids as a way to create a pervious, though walkable surface. Construction is the ultimate goal.
Credit 3 units.

A46 ARCH 436 Mapping Soft Bodies/Constructing Complex Objects
Theory and research on digital design and manufacturing. “Body and soul are thus constructed in the same manner, at the intersection of a cluster of radii of curvature. Both are then simply effects of convergence that are constituted in space, on either side of the surface of the work that envelopes them. It follows that the body is no less ideal than the mind” (Bernard Cache, *Earth Moves*). This course explores the complex systems of geometries that compose the human body. The students invent techniques of digital-mapping the contours of the soft bodies and define the potential for developing new forms of spatial effects uncovered through the digital representation. The mapping procedures are developed to trace and project the human scale and material interface imposed by the fluctuating movements of the bodies in dynamics. Through the making of these forms, each student manufactures new objects through alternative prototyping techniques.
Credit 3 units.

A46 ARCH 4362 Advanced Grasshopper
Credit 3 units.

A46 ARCH 436A Information Modeling and Technology
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 3-D or 4-D 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 436C Coding Growth: Scripting and Computational Methods for Design
The course covers an array of advanced design techniques using scripting within the rhino/grasshopper environment. Although, thorough knowledge of grasshopper is not required, it helps to ease the transition away from graphic algorithm creation and into the C# scripting language. While C# is slightly more difficult than its technical equal, VB, the language can be used in a wide variety of other programs and applications, such as Processing and the Arduino microcontroller, which students have the opportunity to explore should they feel comfortable in those environments. The foundation of the class is based around three major categories: mathematical systems, agent-based systems and simulated growth. Before covering the base material, a three-week intensive overview of grasshopper covers nearly everything students need to know in order to proceed successfully. We begin basic scripting exercises by duplicating existing grasshopper components and proceed to the advanced categories from there. In the first category, mathematical systems, students learn how to create and control useful L-Systems such as branching, fractals and generational scaling. We then move into topological algorithms, in order to learn how to sort and search through the scripted results.
to quantify their success or failure. Once single codes can be executed relatively successfully, the course progresses into agent-based systems. The topic is introduced through simple investigations in basic geometrical relationships such as circle packing and mesh relaxation. We then study the behaviors of birds, ants, fish and termites in order to extract the necessary parameters to mimic their behavior. Building complexity yet again, students investigate the ways in which one can code growth. This ultimately leads to an architectural project at the pavilion scale for which students are asked to design a single unit that will mutate and deform itself iteratively in order to achieve explicit performance criteria that have been laid out for them. Students learn how to use genetic and generative algorithms, (a combination of the previous lessons) to design the building unit and appropriate transformation criteria and, hopefully, by the end of all of this, each student has designed a site-adaptable, feasible pavilion without knowing what that pavilion will look like in any given application.

Credit 3 units.

A46 ARCH 445 Building Systems
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 450B Readings in Architecture
This weekly seminar course addresses issues of Western architectural thought through a focused series of readings and discussions. The necessity and role of architectural theory in general are examined. Issues of tectonics, historicism, typology, regionalism, modernism, postmodernism and other critical frameworks for the consideration of architecture are thematic subjects of discussion. Selected readings include Vitruvius, Alberti, Laugier, Semper, Ruskin, Le Corbusier, Gropius, Kahn, Rossi, Venturi, Eisenman, Libeskind and Koolhaas. Weekly reading assignments, attendance, participation, one summary and discussion introduction based on a reading topic, final paper.

Fulfills history/theory requirement.

Credit 3 units.

A46 ARCH 452G Modern Architecture in Japan
Credit 3 units.

A46 ARCH 452H Tokyo: Destruction and Renewal of Japan’s Capital
Tokyo was leveled twice over the course of the 20th century, first by the Great Kanto Earthquake in 1923 and then in the final months of World War II. One of the world’s largest and most technologically advanced cities, Tokyo is also an agglomeration of neighborhoods and still manifests the unique heritage of its Edo-past. In this seminar, we examine themes of continuity and change, local and global, through these cycles of destruction and renewal. In addition to the built environment, we also incorporate other visual and artistic media, such as literature and film. Enrollment in the course does not require prior knowledge of...
Tokyo or the history of modern Japan. Fulfills History/Theory elective requirement. Credit 3 units.

A46 ARCH 452J Empires in Distress
This seminar examined the processes of modernization to building cultures and cities in the non-Western world, focusing on major imperial regimes such as China, Japan, India and Ottoman and Austro-Hungarian empires. We critique the idea of modern architecture emanating from the West as a hegemonic phenomenon and identify localized points of resistance and appropriation. Among the themes are nationalism, regionalism, technology, historiography, institutions of the building industry and culture, vernacular and preservation. MArch students should have completed the Architectural History I & II sequence. The course is open to graduate students and advanced undergraduates. Fulfills the History/Theory elective requirement. Credit 3 units.

A46 ARCH 452k The Ambiguity of Scale: Japan’s Landscape Tradition
Credit 3 units.

A46 ARCH 454A Contemporary Discourses on Public Space
Since the 1980s, public space has been a subject of intense theoretical debate and the key to urban revitalization strategies in cities such as Barcelona, Amsterdam, Berlin, London, Jerusalem, Curitiba, Toronto, New York, etc. Evident from the investigation into this theory and practice is the notion that the design of public space according to the typology of either the 19th century or modern city does not suffice and that the domain of contemporary public space demands a new discourse. This seminar investigates the theoretical framework and practice of various contemporary discourses on public space in order to reveal the implicit intellectual frameworks and practices. Discourses investigated include public space as the mimicry of history to public space as non-place; and from public space as the enclave of fear and marginality to public space as the theater of economic and social exchange. The seminar also situates the design discourse in the broader political, social and philosophical discourses of the public sphere. Credit 3 units.

A46 ARCH 455A Urban Books: Imag(in)ing St. Louis
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. This seminar critically embraces this tradition and brings together different methodologies for the visual analysis and representation of contemporary urban phenomena, using St. Louis as a focal point. The goal is to design and produce individual books as a result of research, visual documentation, readings and discussions in a seminar and workshop structure. Each student selects and develops a theme related to the urbanization of St. Louis that is organized into books that present how this metropolitan area has been conceived through images. The course is divided into three parts combining readings, research and design activities, each of which culminates in the presentation of an individual project: a total of two study books and a final book. Fulfills urban issues elective requirement. Credit 3 units.

A46 ARCH 455C DuBois Meets Churchill: Social Justice and the Built Environment
Winston Churchill famously stated, “We shape our buildings and afterwards, our buildings shape us.” W.E.B. DuBois equally famously stated, “The problem of the 20th century is the problem of the color-line.” This course is about what happens (and has happened, and perhaps could happen) at the intersection of those two quotes. With the built environment always in the middle of the table, but never in isolation, students in this course consider its role relative to social justice as viewed through a multitude of lenses. Schedules permitting, faculty from other schools in the university also might offer their perspectives on how their respective disciplines touch on issues of social justice and the built environment. There also might be field trips to a few selected locations around St. Louis where some of these issues have played out or are playing out. This course deals with many of the issues that the fall course, Community Building/Building Community, deals with, but in a lecture format. This is partly the result of weather constraints (the spring semester is not as amenable to extensive field trips as the fall semester is), but it also allows students who can only take a spring course to do so, and in a more traditional lecture format, without as many tours and without the community service requirement. Credit 3 units.

A46 ARCH 462H Information Modeling for Sustainable Design
Credit 3 units.

A46 ARCH 462K Productive Systems: Ecological Articulations in Architecture
Credit 3 units.

A46 ARCH 462L Articulating an Idea
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
A46 ARCH 463A Emerging (Re)Development Strategies  
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 mainstream 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 MUD 463B  
Credit 3 units.

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 464B Spatial Representations in Contemporary Culture  
The main objective of this seminar is to analyze the crisis of representation in contemporary culture and its relationship to architecture and the urban landscape, looking for a critique of architecture beyond formal aspects. The framework for the seminar is the transition of modernity into the contested terrain of postmodernity, and the limitations and possibilities faced by architects in the thinking and in the production of space. The activities are mainly organized along the reading and discussion of texts drawn from a multidisciplinary theoretical approach, and by the analysis of examples of representation from films, artworks, architecture and the city.  
Credit 3 units.

A46 ARCH 464C Contemporary Theories in Architecture and Urban Practices  
Since the 1960s the practice of design in architecture and urbanism has been increasingly associated with a theoretical framework. Theory has both provided support to the investigation of the phenomena related to the built environment and has faced problems in the translation of abstract constructs into the practice of design. This seminar presents examples of relevant contemporary interpretive and critical theory and confronts them with current practices in architecture and urbanism. The purpose of this confrontation is to develop skills to articulate individual critiques of design as a mediation between discourse and practice. Required work: The seminar activities take place in the form of reading and discussion of texts, and analyses of current examples of architecture and urban practices. Each student must investigate an individual case study to be presented in the form of a seminar as well as a final paper. Prerequisite: ARCH 222 or ARCH 223. Fulfills history/theory elective.  
Credit 3 units.

A46 ARCH 464D Drawing and Urbanism  
Credit 3 units.

A46 ARCH 467 The Visible and the Invisible  
A seminar on philosophy, criticism and architecture providing an intellectual framework for making architecture, by investigating the development of thought and ideas in other disciplines and the effect they have had in the arts. Specific assigned readings are presented and discussed by the class weekly. Emphasis
placed on the discussion and the formulation of personal interpretations developed after careful and thoughtful reading. Offers an arena in which theory and practice, often seen as irreconcilable, can be understood as inseparable aspects of the same realm, informing both the author and the work. Fulfills history/theory requirement. Credit 3 units.

A46 ARCH 469B Appraising the Opaque: Studies of Architectural Opacity
Credit 3 units.

A46 ARCH 470D The Description of Place
The means by which we come to an understanding of a place profoundly effects any subsequent action taken in that place — specifically the action of building. The possibility for place to gather and hold, not only things, but also ourselves, our memories and our imaginations — the event of place — is defined as place becomes concretely defined and choreographed as a static background for action, rather than as a fluid and dynamic action itself. In order to reassert the active reflecting and gathering power of place and, subsequently, of architecture, the process of knowing and describing where we build needs to be reconsidered. This seminar focuses on the potential for visual description to effect alternative readings of place that are otherwise obscured, and speculate regarding the implications of such readings on the making of architecture. The course is divided equally between theory and making. In addition to discussions surrounding assigned readings, students select a specific place of study in St. Louis from which they develop different methodologies for observation and description over the course of the semester. Students have a choice of submitting either a final paper or project, which speculates as to what new understandings have emerged and what possible actions could result from their study. Credit 3 units.

A46 ARCH 470E Extreme Architecture
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
Credit 3 units.

A46 ARCH 475D Landscapes Through Time: The History of St. Louis’ Built Environment
Credit 3 units.

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 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 in which 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.

A46 ARCH 476 Approach: A Studio in Publication Design
Credit 3 units.

A46 ARCH 477 Contemporary Landscapes
This course examines current practices in landscape architecture and the discourses that shaped the field during the last 20 years. Organized thematically around the topics of ecology, infrastructure and sustainability, the course aims to provide a number of critical perspectives on the relevance of landscape architecture as a cultural practice. Readings and discussions supplement lectures to trace back contemporary ideas to the late 19th and early 20th centuries. The course also incorporates field trips and presentations by visitors, as well as applied research. The seminar is open to all graduate students. Undergraduates can enroll with the instructor’s permission. Same as LAND 477 Credit 3 units.

A46 ARCH 4782 Modern Architecture in St. Louis
Credit 3 units.
A46 ARCH 478A Mid-Century Modernism in St. Louis 1930–1965
Credit 3 units.

A46 ARCH 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.
Same as LAND 480B
Credit 3 units.

A46 ARCH 484B Notations on Florentine Architecture
This seminar proposes a historical survey of significant buildings and urban spaces in Florence through the graphic documentation and spatial analysis of selected sites and buildings from antiquity to the Renaissance and to modernism. The general framework of our analysis is to understand the relationship between the historic development of the city and its most symbolic architecture. This approach is based on the work of Italian scholars, such as Giulio Carlo Argan, who define the history of architecture as the history of the city. The course is methodically divided into two blocks of exercises. In the first part of the semester, we focus on readings, site visits, sketches, analytical drawings and photos, as well as the mapping of the urban development of Florence. In the second part of the semester, students focus on the tectonic study of specific buildings through the construction of representational and experimental models. Each student’s individual work contributes to a collective 2-D and 3-D final project to be presented as an exhibition in the Florence Studio during the spring and to be shown at the College of Architecture in the fall.
Credit 3 units.

A46 ARCH 484C Metabolic City: Drawing and Urbanism
Credit 3 units.

A46 ARCH 484D Space, Society and the Digital
Credit 3 units.

A46 ARCH 484F Monte Carlo Seminar: Drawing the Body, Imagining the City
In 1969, Archigram released one of its most iconic, yet probably also most enigmatic projects — Features: Monte Carlo. A mixed-use proposal for a performance and recreational space, it was both a building blueprint and a discursive device that operated on the scale of the human body and the city. It wove together issues of bodily and environmental wellness and performance, critically engaging the complexities of emerging global culture: mass media, entertainment industry and various environmental issues. The seminar revisits these questions through a combination of theoretical texts and projects, challenging the students to unpack the environment as a complex cultural, social and technological construct. The rich cultural history of Monaco serves as a springboard for these conversations — from the projects by Charles Garnier, Le Corbusier, Archigram and Yona Friedman to the wide-reaching experiments in modern art, design and dance of the Ballet Russe, including its avant-garde choreography by Serghei Diaghilev, stage set designs by Pablo Picasso and costume designs by Leon Bakst, Monaco sustained a highly innovative level of cultural production that was often eclipsed by its socioeconomic peculiarities. By unpacking these innovations within a larger historical and theoretical context informed by the texts of Walter Benjamin, Reyner Banham, Dean MacCannell and others, the seminar draws together bodily experiences and global cultures in modern cities. Open to graduate and upper-level undergraduate students. Fulfills history/theory elective requirement.
Credit 3 units.

A46 ARCH 486A NOMA National Design Competition
Credit 3 units.

A46 ARCH 487 American Architectural Culture Since 1945
This seminar focuses on new ways of thinking about American architecture in the postwar period, to develop new conceptual frameworks to better understand American architecture in the postwar years in its larger context of social, political and urbanistic change. Unlike a history survey course, it not only focuses on the canonical works of well-known designers such as Mies van der Rohe or Louis Kahn, but also situates such work within the various new spatial, technological and social directions of the postwar era. It begins by examining how American architecture changed from the neo-Classical- and Arts and Crafts-inspired directions of the prewar years into the more fragmented and complex situation after 1945. This course also considers the complicated ways that American cities in that period were transformed from dense, streetcar-based industrial environments into sprawling suburban metro areas, typically also becoming racially divided in this process. It also looks at some of the complexities within modern architecture itself, some of which developed directly into postmodernism. These included important innovations in spatial organization, environmental planning and new building technologies, as well as fundamental changes in landscape design, campus design and public school design that have since become part of mainstream practice. Important changes in building technology in this era, which have also tended to be undervalued in the shadow of later concerns about building imagery, also are addressed. Open to graduate students and advanced undergraduates in architecture, art, art history and history. Prerequisite: ARCH 4284 Architectural...
History II or equivalent course taken elsewhere. Fulfills history/theory elective requirement.
Credit 3 units.

A46 ARCH 488 Architecture Service Learning Practicum
The Sam Fox School of Design & Visual Arts, College of Architecture and Graduate School of Architecture & Urban Design give a problem-solving studio workshop about architecture, community and the environment. Fourth- through 10th-grade students from schools in the St. Louis Public School District do 2-D and 3-D hands-on problem-solving projects, use the libraries and computer labs on campus, and be introduced to the field of architecture through lectures and discussions about design projects they undertake. Architecture faculty member Gay Lorberbaum leads the curriculum. Washington University graduate and undergraduate students in architecture participate in the important responsibility of being teaching assistants.
Credit 2 units.

A46 ARCH 490 Architecture Service Learning Practicum
The Sam Fox School of Design and Visual Arts, College of Architecture and Graduate School of Architecture & Landscape Architecture & Urban Design, give a problem-solving studio workshop about architecture, community and the environment. Fourth through 10th grade students from schools in the St. Louis Public School District do 2-D and 3-D hands-on problem solving projects, use the libraries and computer labs on campus, and are introduced to the field of architecture through lectures and discussions about design projects they undertake. Architecture faculty member Gay Lorberbaum leads the curriculum. Washington University graduate and undergraduate students in architecture participate in the important responsibility of being teaching assistants.
Credit 2 units.

A46 ARCH 490A Explore and Contribute: Collaboration between Washington University and Henry Elementary School
Credit 3 units.

A46 ARCH 499 Senior Capstone in Architecture
Credit 3 units.

Landscape Architecture

A48 LAND 317 Architectural Design I (Landscape)
The first of a three-semester sequence that introduces students to architectural design, focusing on conceptual, theoretical, and tectonic principles. First-semester MArch 3 students only.
Same as ARCH 317
Credit 6 units.

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 422 GIS
This course module introduces GIS mapping software and its application to methods used in site planning and design. The focus of this half-semester course is to understand the potential of GIS to analyze, visualize and utilize complex data. Students learn techniques and tools in ArcGIS software and explore how these can be applied to projects specific to individual sites. This course introduces new skills and analytical complexity while building upon previously learned representation techniques.
Credit 1.5 units.

A48 LAND 431 Landscape on Structure
This course examines materials and technologies for landscapes on structure — green roofs and vertical gardens, among others. Through a series of case studies, students gain an understanding of the relationships between structure (architecture and infrastructure) and substrate, soil, water and plants. Topics covered include innovative planting and urban streetscape systems, and infrastructural adaptation and reuse. Exercises range from analytical diagrams of construction methods to design concepts for living systems adapted to a
variety of structural and environmental conditions. Open to students in architecture, landscape architecture and urban design. Credit 3 units.

A48 LAND 451 Plants & Environment
Credit 1.5 units.

A48 LAND 452 Planting Design I
Credit 1.5 units.

A48 LAND 452k The Ambiguity of Scale: Japan’s Landscape Tradition
Same as ARCH 452k
Credit 3 units.

A48 LAND 461 Grading + Landform
Credit 1.5 units.

A48 LAND 462 Landscape Materials
Credit 1.5 units.

A48 LAND 465 Landscape Technology
Throughout the world of spatial design, there has been a strong resurgence of interest in landscape methods as a comprehensive and innovative approach toward defining and engineering sites. Techniques of working the land engage dynamic processes, molding conditions and creating forms in order to control erosion, conserve water and minimize human impacts. As such, landscape methods have created new standards of performance for sites of all sizes and circumstances. Accordingly, this course, intended for students across disciplines, presents an integrated approach to site planning through the intensive study of applied landscape systems. The material covers the spatial and functional systems of designed landscapes and their associated computational and technical aspects: micro- and macrograding, path alignment and drainage calculation. Through studying these techniques, students learn to implement and quantify water management, microclimate manipulation and low-impact circulation, parking and servicing. The principles and methods are presented through short lectures and supported by case studies, class workshops and design exercises, tying theory to practical applications. Credit 3 units.

A48 LAND 477 Contemporary Landscape
This course examines current practices in landscape architecture and the discourses that shaped the field during the last 20 years. Organized thematically around the topics of ecology, infrastructure, and sustainability, the course aims to provide a number of critical perspectives on the relevance of landscape architecture as a cultural practice. Readings and discussions supplement lectures to trace back contemporary ideas to the late 19th and early 20th centuries. The course also incorporates field trips and presentations by visitors, as well as applied research. The seminar is open to all graduate students. Undergraduates can enroll with the instructor’s permission. Credit 3 units.

A48 LAND 480 Case, Trace, Displace: Dialogue between River and City
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.