College of Architecture

Sam Fox School of Design & Visual Arts

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

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

Architecture

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

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

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

Architecture is an absorbing, fascinating profession. Choosing architecture as a professional career requires a major educational commitment at the undergraduate level 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 undergraduate chair to help students build an individualized curriculum, select specific courses, and chart plans for their future careers.

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

Faculty

Endowed Professors

Kathryn Dean (http://samfoxschool.wustl.edu/directory/242)
JoAnne Stolaroff Cotsen Professor
MArch, Oregon School of Architecture & Allied Arts

Bruce Lindsey, AIA (http://samfoxschool.wustl.edu/portfolios/faculty/bruce_lindsey)
E. Desmond Lee Professor for Community Collaboration
MFA, University of Utah
MArch, Harvard University
Adrian Luchini (http://samfoxschool.wustl.edu/directory/479)
Raymond E. Maritz Professor of Architecture
MArch, Harvard University

Robert McCarter (http://samfoxschool.wustl.edu/directory/298)
Ruth & Norman Moore Professor
MArch, Columbia University

Eric Mumford (http://samfoxschool.wustl.edu/directory/487)
Rebecca and John Voyles Professor of Architecture
PhD, Princeton University

Professors

Rod Barnett (http://samfoxschool.wustl.edu/portfolios/rod_barnett)
PhD, University of Auckland

John Hoal (http://samfoxschool.wustl.edu/portfolios/faculty/john_hoal)
PhD, Washington University

Sung Ho Kim (http://samfoxschool.wustl.edu/directory/139)
MSci, Massachusetts Institute of Technology

Stephen P. Leet (http://samfoxschool.wustl.edu/directory/473)
BArch, University of Kentucky

Igor Marjanovic (http://samfoxschool.wustl.edu/portfolios/faculty/igor_marjanovic)
PhD, Bartlett School of Architecture, University College of London

Heather Woofter (http://samfoxschool.wustl.edu/portfolios/faculty/heather_woofter)
MArch, Harvard University

Professors of Practice

Valerie Greer (http://www.samfoxschool.wustl.edu/portfolios/valerie_greer)
MArch, Washington University

Eric R. Hoffman (http://samfoxschool.wustl.edu/directory/469)
MArch, Washington University

Philip Holden (http://samfoxschool.wustl.edu/directory/471)
MArch, Washington University

Xiaobo Quan
PhD, Texas A&M University

Associate Professors

Gia Daskalakis (http://samfoxschool.wustl.edu/directory/1589)
Dipl de Postgrado, Universidad Politecnica de Cataluña

Robert Hansman (http://samfoxschool.wustl.edu/directory/58)
BFA, University of Kansas

Patricia Heyda (http://samfoxschool.wustl.edu/directory/59)
MArch, Harvard University

Derek Hoeferlin (http://samfoxschool.wustl.edu/directory/61)
MArch, Tulane University

Zeuler Lima (http://samfoxschool.wustl.edu/directory/474)
PhD, Universidade de São Paulo

Linda C. Samuels (http://samfoxschool.wustl.edu/portfolios/linda_samuels)
PhD, University of California, Los Angeles

Hongxi Yin
PhD, Carnegie Mellon University

Assistant Professors

Chandler Ahrens (http://samfoxschool.wustl.edu/directory/7147)
MArch, University of California, Los Angeles

Eric Ellingsen (http://samfoxschool.wustl.edu/directory/52)
MArch, MLA, University of Pennsylvania

Constance Vale
MArch, Yale University

Jesse Vogler (http://www.samfoxschool.wustl.edu/portfolios/faculty/jesse_vogler)
MArch, University of California, Berkeley

Visiting Professor

Peter Rose
MArch, Yale University

Visiting Assistant Professor

Jonathan Stitelman (http://samfoxschool.wustl.edu/portfolios/jonathan_stitelman)
MArch, Washington University

Senior Lecturers

Ryan Abendroth
MArch, University of Illinois at Urbana-Champaign

Michael Allen
BA, Union Institute and University

Don Koster (http://samfoxschool.wustl.edu/directory/47)
MArch, Washington University

Doug Ladd
MS, Southern Illinois University at Carbondale

Gay Lorberbaum (http://samfoxschool.wustl.edu/directory/475)
MArch, Washington University

Jacqueline Margetts
MPhil, University of Auckland (New Zealand)
Bob Moore  
PhD, Washington University  
Pablo Moyano (http://samfoxschool.wustl.edu/portfolios/faculty/pablo_moyano)  
MArch, Washington University  
Phillip Shinn (http://samfoxschool.wustl.edu/directory/491)  
BSE, Princeton University  
Lindsey Stouffer (http://samfoxschool.wustl.edu/directory/492)  
MFA, Washington University

Ian Trivers  
PhD, University of Michigan  
Jan Ulmer  
MArch, University of the Arts, Berlin

Professors Emeriti  
Paul Donnelly  
Iain A. Fraser  
Gerald Gutenschwager  
James Harris  
Sheldon S. Helfman  
Udo Kultermann  
Leslie J. Laskey  
Donald Royse  
Thomas L. Thomson

Dean Emeritus  
Constantine E. Michaelides  
FAIA

Majors  
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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 311</td>
<td>Architectural Design I</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 312</td>
<td>Architectural Design II</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 3284</td>
<td>Architectural History II: Architecture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Since 1880</td>
<td></td>
</tr>
<tr>
<td>ARCH 333</td>
<td>Case Studies in 20th-Century Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 445</td>
<td>Building Systems</td>
<td>3</td>
</tr>
<tr>
<td>Capstone Course</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

For additional information on current requirements, please visit the Degree Requirements (http://bulletin.wustl.edu/prior/2017-18/undergrad/architecture/requirements) page.

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 311</td>
<td>Architectural Design I</td>
<td>6</td>
</tr>
<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</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Since 1880</td>
<td></td>
</tr>
<tr>
<td>ARCH 333</td>
<td>Case Studies in 20th-Century Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 445</td>
<td>Building Systems</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>
</table>

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 (http://bulletin.wustl.edu/prior/2017-18/undergrad/architecture/requirements) page.

Minors  
The Minor in Architectural History and Theory  
Minor Adviser: Eric Mumford (epm@wustl.edu)

The minor in architectural history and theory is open to all students at Washington University in St. Louis, regardless of major. Students interested in the minor should contact the designated minor adviser.

Units required: 18* including:

9 units of architectural history survey:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 3283</td>
<td>Architectural History I: Premodern Encounters in World Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 3284</td>
<td>Architectural History II: Architecture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Since 1880</td>
<td></td>
</tr>
<tr>
<td>ARCH 4288</td>
<td>Architectural History III: Advanced Theory</td>
<td>3</td>
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</tbody>
</table>
3 units of methodology course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ARCH 601</td>
<td>Theories &amp; Methods of Historical Research</td>
<td>3</td>
</tr>
</tbody>
</table>

or

Other methodology-based courses approved by the minor adviser

6 units of architectural history and theory electives (300-level or above) 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 Architecture

**Minor Adviser:** Derek Hoeferlin (hoeferlin@wustl.edu)

The minor in architecture is open to all students at Washington University in St. Louis, regardless of major. Students interested in the minor should contact the minor adviser.

**Units required:** 18

**Required courses:**

6 units minimum of introductory design chosen from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 111</td>
<td>Introduction to Design Processes I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 112</td>
<td>Introduction to Design Processes II</td>
<td>3</td>
</tr>
</tbody>
</table>

3 units minimum of history chosen from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 3283</td>
<td>Architectural History I: Premodern Encounters in World Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 3284</td>
<td>Architectural History II: Architecture Since 1880</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 3823</td>
<td>Rethinking Renaissance Visual Culture - Florence Summer Program</td>
<td>3</td>
</tr>
</tbody>
</table>

or

Other architectural history courses approved by the minor adviser

**Elective courses:** 9 units chosen from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 211B</td>
<td>Introduction to Design Processes III</td>
<td>4.5</td>
</tr>
<tr>
<td>ARCH 212B</td>
<td>Introduction to Design Processes IV</td>
<td>4.5</td>
</tr>
<tr>
<td>ARCH 209</td>
<td>Design Process</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 333</td>
<td>Case Studies in 20th-Century Architecture</td>
<td>3</td>
</tr>
</tbody>
</table>

or

Other elective courses approved by the minor adviser

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### The Minor in Landscape Architecture

**Minor Adviser:** Jacqueline Margetts (jacqueline.margetts@wustl.edu)

The minor in landscape architecture is for students who will be receiving either a Bachelor of Science or Bachelor of Design with a major in architecture. Interested students should contact the minor adviser.

**Units required:** 18* including:

6 units of design course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 312</td>
<td>Architectural Design II</td>
<td>6</td>
</tr>
<tr>
<td>or ARCH 412</td>
<td>Architectural Design IV</td>
<td></td>
</tr>
</tbody>
</table>

3 units of history course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND 571</td>
<td>Landscape History II: Prehistory to 1850</td>
<td>3</td>
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</tbody>
</table>

or

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND 574A</td>
<td>Modern and Contemporary Landscape Architecture</td>
<td>3</td>
</tr>
</tbody>
</table>

or

Other history/theory courses as approved by the minor adviser

3 units of ecological systems course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND 551A</td>
<td>Landscape Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

6 units of electives:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>LAND 423D</td>
<td>Videography for Designers</td>
<td>3</td>
</tr>
<tr>
<td>LAND 483A</td>
<td>Emergence in Landscape Architecture</td>
<td>3</td>
</tr>
<tr>
<td>LAND 524F</td>
<td>Critical Spatial Practice: Art / Architecture / Landscape / Urbanism</td>
<td>3</td>
</tr>
<tr>
<td>LAND 529G</td>
<td>The Unruly City</td>
<td>3</td>
</tr>
<tr>
<td>LAND 553</td>
<td>Integrated Planting Design</td>
<td>3</td>
</tr>
<tr>
<td>LAND 560A</td>
<td>Trees, Soils, &amp; Systems: Introduction to Arboriculture</td>
<td>3</td>
</tr>
<tr>
<td>LAND 565</td>
<td>Landscape Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

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 Adviser: Patty Heyda (heyda@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 Design with a major in architecture. Interested students should contact the designated minor adviser.

Units required: 18* including:

6 units of foundational course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCORE 307</td>
<td>Community Building</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 241</td>
<td>Community Dynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

6 units of design course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 312</td>
<td>Community Building</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 412</td>
<td>Urban Design-Focused Studio (6 units)</td>
<td></td>
</tr>
</tbody>
</table>

6 units of advanced course work:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 656</td>
<td>Metropolitan Urbanism</td>
<td>3</td>
</tr>
<tr>
<td>MUD 658</td>
<td>Metropolitan Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td>Other MUD-track electives as approved by the adviser</td>
<td>3</td>
</tr>
</tbody>
</table>

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

Additional Information

Students declare an architecture minor by using the university's online registration system (WebSTAC (https://acadinfo.wustl.edu/WSHome/Default.aspx)).

Students must receive a grade of C- or better to earn minor credit.

Students should check the current course listings (https://courses.wustl.edu/Semester/Listing.aspx) carefully to verify their eligibility to enroll in courses that have specific prerequisites.

Courses

College of Art and College of Architecture majors will have enrollment priority in X10 courses.

X10 XCORE (p. 5): Sam Fox foundation and commons courses

A46 ARCH (p. 10): Architecture

A48 LAND (p. 29): Landscape Architecture

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. This class counts toward the minor in art or minor in design for non-Sam Fox School students. Credit 3 units. Art: FAAM, FADM

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 is to develop a higher level of critical and studio practice. Prerequisite: X10 101. Credit 3 units. Art: FAAM 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. The course 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 in the Interdisciplinary Project in the Humanities (IPH). Credit 3 units. Art: FADM 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. Attendance required at three animation screenings. Credit 3 units. Art: FADM 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. CET (https://gephardtinstitute.wustl.edu/cec/sam-fox-school-of-design-and-visual-arts) course. Credit 3 units. EN: H

X10 XCORE 307X Community Building North
This course addresses the complex economic, political and racial landscape of north St. Louis County focused on Ferguson, Missouri, as the embodiment of problems and conflicts endemic to urban communities across the country. The events following Michael Brown's shooting death on August 9, 2014, have revealed deep divisions in the St. Louis metropolitan area. Our multidisciplinary approach will be evident as we investigate the intersecting, compounding roles of social and economic inequities, racial disparities, white flight, public safety, housing, and economic development as we grapple with legitimate, thoughtful ways of making positive change. We'll learn how to listen to, understand and address conflicting voices. Readings, speakers, site visits, films and other materials will be combined with discussion, writing, and socially conscious engagement as we seek to understand the many faces of Ferguson while following contemporary developments as they occur. Professor Robert Hansman acts as adviser and guide. The interdisciplinary course he developed over many years, Community Building/Building Community, provides the intellectual, ethical and spiritual bases as co-taught by Rainist and Hansman. This course offers fresh perspectives and provides unique opportunities for community engagement for students who have previously taken Community Building; however, that course is not a prerequisite. Projects develop collaboratively and organically between students, faculty and community partners.
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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. Credit 3 units. EN: H

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. The course culminates with the public presentation of this work. Credit 3 units. EN: H

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 have basic shop skills addressed in course prerequisites. Advanced techniques will be 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 and develop ideas using drawings, models and mock-ups in order to realize the best potential for their design. Credit 3 units. EN: H

X10 XCORE 317X Furniture Design
This course explores design and fabrication methods for objects of human interaction. Each student will design and build a table, based on a unique concept. To this end, it is up to the individual student to define what the particular table is for, and clearly communicate their intentions and ideas. Contemporary technologies will be combined with traditional techniques of metal fabrication, woodworking and plastic forming in the
design and production. 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 will be introduced, and students will select those most appropriate to their work to build upon. A high level of craft and a great deal of independent investigation are required to excel in this course. Students propose and develop ideas using drawings, models and mock-ups in order to realize the maximum potential for their design. College of Architecture and College of Art sophomores, juniors and seniors have priority. Fullfills Sam Fox Commons requirement.
Credit 3 units. EN: H

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 3D, 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. The 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. The course is offered as part of the universitywide Global Certificate and is open to all students at Washington University regardless of their major field of study.
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. Art: FADM EN: H

X10 XCORE 327X Color Systems
This course is a sustained investigation of color. Students study how color is affected by light, by space, by arrangement, by culture, and by commerce. The course aims to deepen the understanding of color’s complexity and pervasiveness as a fundamental element of shared visual culture. The course develops both technical and conceptual skills to aid in visual translation. In addition to color-specific inquiry, a goal is to expand ideas of research and enable students to integrate various methods of acquiring knowledge into their art and design practice. Throughout the course, students discuss various processes of making/constructing, the connection between color/form/concept, and strategies for idea generation and brainstorming. The course allows for much individual freedom and flexibility within varying project parameters. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fullfills Sam Fox Commons requirement. Prerequisite: Drawing I, Communication Design I, or 2-D Design, or permission of instructor.
Credit 3 units. EN: H

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 reimagined 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 architectural history/theory elective requirement and is also open to all Washington University students.

Credit 3 units. Arch: GAUI, UI Art: FADM EN: H

X10 XCORE 335X 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. CET

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Credit 3 units. Arch: GAUI, UI Art: FADM EN: H

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 to 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 redefine multiple design processes.

Credit 3 units. EN: H

X10 XCORE 343 Digital Filmmaking: City Stories

Digital Filmmaking: City Stories is a cross-university video art course for students interested in making short films through a transdisciplinary and time-based storytelling in both narrative and non-narrative formats. Whether documentary or abstract, individually produced or collaborative, all projects in this course have a required social and urban engagement component. In this course the city becomes a laboratory for experimental performance, virus, urban protest and insurgence. 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.

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Credit 3 units. EN: H
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X10 XCORE 345S 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. Open to sophomores and above. Credit 3 units.

X10 XCORE 347X Furniture Design
This course explores design and fabrication methods for objects of human interaction. Each student will design and build a table, based on a unique concept. To this end, it is up to the individual student to define what the particular table is for, and clearly communicate their intentions and ideas. Contemporary technologies will be combined with traditional techniques of metal fabrication, woodworking and plastic forming in the design and production. 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 will be introduced, and students will select those most appropriate to their work to build upon. A high level of craft and a great deal of independent investigation are required to excel in this course. Students propose and develop ideas using drawings, models and mock-ups in order to realize the maximum potential for their design. College of Architecture and College of Art sophomores, juniors and seniors have priority. Fullllis Sam Fox Commons requirement. Credit 3 units. EN: H

X10 XCORE 386X Public Practice
With architecture, art and design students in mind, Public Practice is a design-build course focused on the development, presentation and actualization of commissioned works within the public realm. Through an iterative process of concept development, material exploration and panel reviews, students will learn how to develop, propose and execute a viable public piece. Individual and/or group proposals will be presented before a selection committee in consideration towards a public art/design commission. Selected projects will be realized within specified sites in the community of University City, MO. Students will have hands-on experiences with construction processes, meeting structural requirements and codes, site development, and project installation which will prepare them for a creative life situated firmly within a discourse of Public Space. Open to MFA, graduate architecture students, BFA and undergraduate architecture students with junior-level standing. Minors and others eligible with consent of instructor. CET (https://gephardtinstitute.wustl.edu/cec/sam-fox-school-of-design-and-visual-arts) course. Credit 3 units.

Architecture

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. Prerequisite: A grade of C- or better in Arch 111 or co-registration in Arch 111. 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. Credit 3 units.

A46 ARCH 175 Designing Creativity: Innovation Across Disciplines
Via a series of lectures from prominent thinkers and practitioners in the areas of medicine, neuroscience, law, engineering, architecture, human-centered design, business, stage design, and the performing arts, Designing Creativity is a course that covers the study and practice of the creative process across many disciplines. From "Ah-ha" epiphanies to slow-developing discoveries, the creative process is employed by innovators and artists in virtually every corner of the globe. In this course, we explore the study of those processes by hearing from creatives in many fields with practice of those techniques via a LAB component that allows students to explore the development of innovative ideas in collaborative teams followed by project presentations to core faculty and classmates. Same as I50 InterD 175 Credit 3 units. A&S IQ: HUM Art: FADM EN: H
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. CET (https://gephardtinstitute.wustl.edu/cec) course. Credit 3 units. EN: H

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, organizational systems and programming. Prerequisites: successful completion of Arch 211B with a grade of C- or better. Credit 4.5 units.

A46 ARCH 241 Community Dynamics
This course builds on the investigations of X10 XCore 307, Community Building, and concentrates on the connections between place-based economic, political and social dynamics. In order to ground discussions in reality, the class immerses itself in the urban laboratory of St. Louis while relating local issues to broader trends. The course is organized using the Community-Based Teaching and Learning methodology and is centered around the first phase of a multi-year inquiry into the potential of design to improve the reality and perception of public safety through targeted projects. Students assemble relevant research on applicable design techniques, brief project partners in the Mayor's Office of the City of St. Louis, work with representatives of the St. Louis Metropolitan Police Department to define focus areas and assess the applicability of design strategies to specific focus areas. The course is divided into a lecture/discussion session on Thursday and a lab section on Friday. The lab section will be divided between independent research and bi-monthly facilitated meetings with city representatives. Credit 3 units.

A46 ARCH 243 Design as Export
This course introduces students to the contemporary global characteristics of design in the late 20th and 21st century. The marketing, fabrication, distribution and consumption of design is global, yet the cultural and formal identity of most design products are national and regional. How do traditions of design and quality based on centuries of a national and regional design culture react and adapt to a global market? What is the culture of design? What is design identity? Italian design is the primary focus of this course, followed by Japanese and Asian design and manufacturing. Case studies include examples of industrial design, fashion design, communication design and automobile design. The course also includes presentations by design curators and representatives of various international design companies. Credit 3 units.

A46 ARCH 2661 Semester Abroad Program Seminar
This course will prepare students participating in the Sam Fox School's Semester Abroad Programs. The seminar will meet eight times over the course of the semester. Attendance is mandatory for students going abroad. Prerequisite: College of Art and College of Architecture students selected for the Sam Fox School Abroad Programs. Same as F20 ART 2661 Credit 1 unit. EN: H

A46 ARCH 275 Service Learning Course: Environmental Issues
This service learning experience allows Washington University students to bring their knowledge and creativity about the many subjects they are studying to students at the Compton-Drew Middle School, adjacent to the Science Center, in the City of St. Louis. This course is for arts and sciences students of differing majors & minors, business, architecture & art students, and engineering students from all engineering departments. The first third of the semester students will: 1) begin learning the creative process of lateral thinking (synthesizing many variables, working in cycles); 2) work with a teammate to experiment with the design of 2-D & 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) each student will work with the professor individually and in their team, as well as seek 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 Washington University students will be on-site during the Compton-Drew school day, once a week on each Monday from 11:00 a.m. to 12:30 p.m., to teach small group workshops for some of the sixth and seventh grade students. This course is open to freshmen, sophomores and juniors. Credit 2 units.

A46 ARCH 306M Visualizing Segregation: A History of St. Louis, Chicago and New Orleans
This interdisciplinary course is designed to introduce students to the history of three of America’s major cities. We will explore the political, social, and cultural histories of each of these cities while tracing changes in architecture and the built environment. We chose these three cities for their diverse and intersecting histories. In many ways, St. Louis, Chicago and New Orleans represent the major social and political forces that forged the
modern American city. From westward expansion and the growth of the slave system, through mass European immigration and industrialization, the rise of Jim Crow and the decline of American industry, suburbanization, mass incarceration, and gentrification: All are visible in the landscapes of these American cities. Segregation of social groups, so often seen as natural or inevitable, is the result of historical processes, political decisions, public policies and individual actions. The course, in addition, will provide students with the opportunity to use some of the research techniques employed by urban scholars. We will engage in a major research project, tracing the history of St. Louis through a variety of primary sources. Our aim will be to trace the historical processes that generated urban landscapes divided along lines of race, class, ethnicity or religion.

Same as I50 InterD 306M
Credit 3 units. A&S: TH, SD A&S IQ: HUM, SD EN: H

A46 ARCH 307X Community Building

This course takes 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 neighborhood (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. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fulfills Sam Fox Commons requirement.

Same as X10 XCORE 307X
Credit 3 units. EN: H

A46 ARCH 308X Community Building North

This course addresses the complex economic, political and racial landscapes of north St. Louis County focused on Ferguson, Missouri, as the embodiment of problems and conflicts endemic to urban communities across the country. The events following Michael Brown's shooting death on August 9, 2014, have revealed deep divisions in the St. Louis metropolitan area. Our multidisciplinary approach will be evident as we investigate the intersecting, compounding roles of social and economic inequalities, racial disparities, white flight, public safety, housing, and economic development as we grapple with legitimate, thoughtful ways of making positive change. We'll learn how to listen to, understand, and address conflicting voices. Readings, speakers, site visits, films, and other materials will be combined with discussion, writing, and socially conscious engagement as we seek to understand the many faces of Ferguson while following contemporary developments as they occur. Professor Robert Hansman acts as advisor and guide. The interdisciplinary course he developed over many years, "Community Building/Building Community," provides the intellectual, ethical, and spiritual bases as co-taught by Raimist and Hansman.

This course offers fresh perspectives and provides unique opportunities for community engagement for students who have previously taken Community Building, however the course is not a prerequisite. Projects develop collaboratively and organically between students, faculty, and community partners working to find common values and beliefs upon which to build concrete, meaningful action. CET (https://gephardtinstitute.wustl.edu/cec) course.

Same as X10 XCORE 308X
Credit 3 units.

A46 ARCH 311 Architectural Design I

This architectural design studio is a final course in the five-semester core studio sequence. It focuses on rigorous design development, from a conceptual exploration of an idea to a detailed building design. Prerequisites: successful completion of the four-semester core design studio sequence, including Arch 212B, with a grade of C- or better. Concurrent registration in Building Systems I required.

Credit 6 units.

A46 ARCH 312 Architectural Design II

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.
Credit 6 units.

A46 ARCH 317X Furniture Design

This course explores design and fabrication methods for objects of human interaction. Each student will design and build a table, based on a unique concept. To this end, it is up to the individual student to define what the particular table is for, and clearly communicate their intentions and ideas. Contemporary technologies will be combined with traditional techniques of metal fabrication, woodworking and plastic forming in the design and production. 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 will be introduced, and students will select those most appropriate to their work to build upon. A high level of craft and a great deal of independent investigation are required to excel in this course. Students propose and develop ideas using drawings, models and mock-ups in order to realize the maximum potential for their design. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fulfills Sam Fox Commons requirement.

Same as X10 XCORE 317X
Credit 3 units. EN: H

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

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

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

A46 ARCH 326J Digital Representations
Digital Representations introduces students to digital modeling and fabrication, parametric workflow, and various 2-D and physical output techniques. Starting from first principles, this course begins with the basics from interface to output for each platform used, developing skills in digital modeling and physical output and serving as a prerequisite for more advanced courses in design scripting and digital fabrication. Students complete a semester-long project divided into three assignments, beginning with developing a detailed digital model of a formal precedent, which introduces students to basic skills in modeling with nurbs, subdivision surfaces, and meshes. Continuing to develop a clear diagrammatic organization and hierarchy, students expand the characteristics of their original formal precedent using Grasshopper to create a set of dynamic, flexible behaviors. Drawing upon their initial understanding and analysis of organizational systems within their formal object, students transfer their observations into the construction of a spatial parametric model that has potential to serve structure, fabrication methods, and material assembly. Finally, students develop their digital model into a geometrically rationalized material system that draws upon their initial precedent, producing a physical model, renderings, and 2-D drawings presented in the format of a final review.
Credit 3 units.

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

A46 ARCH 327X Color Systems
This course is a sustained investigation of color. Students study how color is affected by light, by space, by arrangement, by
culture, and by commerce. The course aims to deepen the understanding of color's complexity and pervasiveness as a fundamental element of shared visual culture. The course develops both technical and conceptual skills to aid in visual translation. In addition to color-specific inquiry, a goal is to expand ideas of research and enable students to integrate various methods of acquiring knowledge into their art and design practice. Throughout the course, students discuss various processes of making/constructing, the connection between color/form/concept, and strategies for idea generation and brainstorming. The course allows for much individual freedom and flexibility within varying project parameters. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fulfills Sam Fox Commons requirement. Prerequisite: Drawing I, Communication Design I, or 2-D Design, or permission of instructor. Same as X10 XCORE 327X
Credit 3 units. EN: H

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 midterm, final exam and research paper.
Credit 3 units. EN: H

A46 ARCH 3284 Architectural History II: Architecture Since 1890
An introductory survey of the history and theory of architecture and urbanism in the context of the rapidly changing technological and social circumstances of the past 120 years. In addition to tracing the usual history of modern architecture, this course also emphasizes understanding of the formal, philosophical, social, technical and economic background of other important architectural directions in a global context. Topics range from architects' responses to new conditions in the rapidly developing cities of the later 19th century, through early 20th-century theories of perception and social engagement, to recent efforts to find new bases for architectural interventions in the contemporary metropolis.
Credit 3 units. Arch: HT EN: H

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. Arch: GARW

A46 ARCH 335X 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. The 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. College of Architecture and College of Art sophomores, juniors, and seniors have priority. Fulfills Sam Fox Commons requirement.
Same as X10 XCORE 335X
Credit 3 units. Arch: GAUI, UI Art: FADM EN: H

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

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

Credit 3 units.

A46 ARCH 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 MARc 3 students. Fulfills history/theory elective for MARc 2 students. Credit 3 units.

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

A46 ARCH 347X Furniture Design
This course explores design and fabrication methods for objects of human interaction. Each student will design and build a table, based on a unique concept. To this end, it is up to the individual student to define what the particular table is for, and clearly communicate their intentions and ideas. Contemporary technologies will be combined with traditional techniques of metal fabrication, woodworking and plastic forming in the design and production. 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 will be introduced, and students will select those most appropriate to their work to build upon. A high level of craft and a great deal of independent investigation are required to excel in this course. Students propose and develop ideas using drawings, models and mock-ups in order to realize the maximum potential for their design. College of Architecture and College of Art sophomores, juniors and seniors have priority. Fulfills Sam Fox Commons requirement. Same as X10 XCORE 347X Credit 3 units. EN: H

A46 ARCH 344X Digital Filmmaking: City Stories
Digital Filmmaking: City Stories is a cross-university video art course for students interested in making short films through a transdisciplinary and time-based storytelling in both narrative and non-narrative formats. Whether documentary or abstract, individually produced or collaborative, all projects in this course have a required social and urban engagement component. In this course the city becomes a laboratory for experimentation and contribution. Students meaningfully engage St. Louis, and their projects address sites of concern to explore the complex fabric of the city by way of framing and poetic juxtaposition. City Stories merge several arts and humanities disciplines, including experimental cinema and documentary journalism and create an opportunity for empathic listening and inquiry as students discover stories built from collective as well as individual memories.

Credit 3 units. Same as X10 XCORE 343

A46 ARCH 345 Service Learning Course: Environmental Issues
This service learning experience allows Washington University students to bring their knowledge and creativity about the many subjects they are studying to students at the Compton-Drew Middle School, adjacent to the Science Center, in the City of St. Louis. This course is for arts and sciences students of differing majors and minors, business, architecture and art students, and engineering students from all engineering departments. In the first third of the semester, students will: 1) begin learning the creative process of lateral thinking (synthesizing many variables, working in cycles); 2) work with a teammate to experiment with the design of 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 seek advice of faculty from a specific discipline throughout the semester in the preparation of their evolving curricular plan. During the last two-thirds of the semester, Washington University students will be on-site during the Compton-Drew
A46 ARCH 355 Interdisciplinary Ecosystems Principles Integration
The mission of this interdisciplinary seminar class is to "advance interrelationships of ecological and human systems toward creating healthy, resilient, and biodiverse urban environments" and will bring together experts and students in ecology, urban design, architecture/landscape architecture, economics, social work, and engineering, drawing from inside and outside the Washington University community.
Credit 1 unit.

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.
Same as F20 ART 363
Credit 3 units. Art: FAAM EN: H

A46 ARCH 367 Design Thinking for Science, Engineering, Business and the Liberal Arts
This introductory course outlines strategies and methodologies drawn from a wide range of creative design practices, including architecture, landscape architecture, urban design, industrial design and others. The course explores how these ideas and techniques are similar to practices in science, engineering, business and the liberal arts and how they might be applicable to multidisciplinary problem solving. Topics include perception, representation, technology, group intelligence, bio-mimicry and context-based learning, among others. Emphasis is given to the intersection of design thinking with environmental problems and the relationship between design thinking and innovation. The course includes lectures, guest lectures with case studies, and design projects. Open to all undergraduate students.
Credit 1 unit. EN: H

A46 ARCH 3824 The Italian Renaissance in the City of Florence
This course encompasses the Renaissance from Giotto through the High Renaissance. Students examine first-hand the works they are studying. Included are field trips to Rome and Venice.
Same as F20 ART 3824
Credit 3 units. EN: H

A46 ARCH 3825 Florence as a Cultural Artifact: The History of Architecture as the History of the City
This course combines seminar and workshop activities aiming at the understanding of the rich urban and architectural history of Florence, the place of students' work and temporary living during the study abroad program. These activities will be in dialogue with the design studio and art history courses. The intellectual framework of the course is informed by Giulio Carlo Argan's seminal work "La storia dell'arte come storia della città" ("The history of art as the history of the city," Einaudi, 1983), presenting the city as a complex time-space phenomenology of cultural artifacts. While Florence is well known for its cultural contribution to Western cultural history during the 1400s and 1500s, little is known about the full span of its millennial history, including its contemporary developments. The seminar activities will cover such aspects through readings and lecture-cum-sketching urban and architectural documentation tours in the first part of the semester, leading to the development of individual artists' book projects to be completed in the second part of the semester for the program's semester exhibition.
Credit 3 units.

A46 ARCH 3825 Special Topics: Franco Albini and Carlo Scarpa (Study Abroad)
A history/theory seminar course examining the works of the Italian architects Franco Albini (b. 1905, Robbia [Milan] - 1977) and Carlo Scarpa (b. 1906, Venice - 1978), as well as "the school of Florence," a group of modern architects who worked primarily in and around Florence, Italy, including Leonardo Savioli (b. 1917, Florence - 1982), Giovanni Michelucci (b. 1899, Pistoia - 1990) and Leonardo Ricci (b. 1918, Rome - 1994). Introductory lectures by the professors will be followed by student research and case studies of selected buildings and projects. Students will participate in field trips conducted by the professors to buildings and sites in and around Florence (works of Savioli, Ricci, Michelucci and Scarpa). A field trip to Milan in the first half of the semester will include visits to the Franco Albini Foundation with a lecture by the architect Marco Albini, as well as several exhibition installations designed by Albini, and his contemporaries Belgiojoso, Peresutti and Rogers. A field trip to Venice, Vicenza and Verona in the second half of the semester will include visits to projects designed by Scarpa, including the Olivetti Showroom, Querini Stampalia, Correr Museum, Castelvecchio Museum, and the Banca Popolare di Verona. Students will analyze and present buildings and installations employing varying methods of analysis, both graphic and photographic.
Credit 3 units. Arch: HT

A46 ARCH 386X Public Practice
With architecture, art and design students in mind, Public Practice is a design-build course focused on the development, presentation, and actualization of commissioned works within the public realm. Through an iterative process of concept development, material exploration, and panel reviews, students will learn how to develop, propose and execute a viable public piece. Individual and/or group proposals will be presented before a selection committee in consideration toward a public art/design commission. Selected projects will be realized within specified sites in the community of University City, MO. Students will have hands-on experiences with construction processes, meeting structural requirements and codes, site development, and project installation which will prepare them for a creative life situated firmly within a discourse of Public Space. Open to MFA, graduate architecture students, BFA and undergraduate
A46 ARCH 401B Color in Architecture, Design and Art
This seminar introduces students to aspects of color in architecture, design and art and deals primarily with 19th-, 20th- and 21st-century theories and projects. Student work includes readings and discussions, case studies and experiments in color application. Research includes case study architectural examples by Rietveld, Herzog & De Meuron, Luis Barragan, SANAA and others; readings on color theory by architects Alberti, Bernard Leger, Koolhaas, Le Corbusier; artists Mondrian, Josef Albers, Richard Paul Lohse, Ad Reinhardt, Barnett Newman, Donald Judd; philosophers Goethe, Wittgenstein, Barthes; psychologists Carl Jung; and designers Irma Boom, Ettore Sottsass, Bruno Munari and Konstantin Grcic. Resources will include the collections of the Mildred Lane Kemper Art Museum and the Saint Louis Art Museum.
Credit 3 units.

A46 ARCH 402A Measured Representation
This course proposes to investigate and create a series of measured drawings. The drawings, as architectural objects, configure architectural knowledge, perception and vision. We will begin by studying precedent drawings in relation to each architect's theoretical framework, project description and technique. The range of works will relate different types of construction (perspectives, axonometrics, diagrams, ideagrams, assemblages, montages, descriptive geometry, and mapping) with integral and symbiotic theoretical agendas. Each student will learn the techniques of representation in their case study and from this example construct an interpretation of a specified site in this language. With a collection of theoretical frameworks and workshops on various techniques, the class will qualify a series of sites through drawing/interpreting the shadows present. Shadows may be thought of as reductions of the real object — in this sense, the drawings will act as abstractions or reductions that promote vision. Instead of simply discussing qualities of space, narratives of metaphor, intangible phenomena, implications of constructed geometry, this architectural research project attempts to propose methods of seeing such that the representation may play a more active role in the shaping of design. This course centers on the creation of imaginative processes of representation.
Credit 3 units.

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

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

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

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

Credit 3 units. A&S IQ: SSC EN: S

A46 ARCH 405D Furniture Design

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

Credit 3 units.

A46 ARCH 408A Digital Visualization Workshop: 2-D Representation

This workshop is an introduction to basic AutoCAD 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

This course develops digital design skills using the t-spline plug-in for Rhinoceros. As the field of architecture begins to incorporate evermore complex forms and formal strategies, it is necessary for designers to have the ability to work efficiently with advanced modeling software. This allows the development of clean, fluid forms that can be manipulated and transformed as part of the design process, not merely as an output. The course breaks down into four three-hour sessions in which students will have three assignments designed to give a basic understanding of the t-spline plug-in, as well as to show how this type of form manipulation applies to the field of architecture. This course is required for all students in the core graduate program during 318 studio semester.

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

The future of the design and construction industry is going to be driven by the use of technology. The best example emerging today is the use of three-dimensional, intelligent design information, commonly referred to as Building Information Modeling (BIM). BIM is expected to drive the AEC industry toward a "model-based" process and gradually move the industry away from a "2-D-based" process. The BIM 101 workshop is for future designers who recognize that this future is coming and who are looking for a way to begin preparing themselves in order to be ready when it arrives. We will explore how BIM is being used today and learn the basics of one of the leading BIM tools, Autodesk Revit Architecture 2009. This workshop is intended for senior undergraduate students and graduate students at the 500 level and above.

Credit 1 unit.
A46 ARCH 408J Performance Enhancing
The term "performance" has many meanings that are either quantitative, qualitative, or both simultaneously through a range of design professions. The suggested goal of performance is an optimistic enhancement to a designed entity or idea and holds the potential to be highly provocative relative to the method it is deployed when arguing for a particular design procedure or effect. The double entendre suggested by the term performance relates to both how the system technologically improves a functional aspect along with a more theatrical act of performing. Design in both architecture and fashion relies on both interpretations to create a multidisciplinary discourse necessary to advance conceptual design investigation. The seminar class explores issues of performance of complex surfaces at the scale of the human body. The class consists of lectures, discussions, readings, physical material manipulation, and 3-D digital modeling and digital fabrication. The use of Rhino (with T-splines and/or Grasshopper) or Maya is deployed for the digital design of the skin systems. Material systems are explored initially through manual experimentation and then combined with the digital investigation for the final digital fabrication using tools such as 3-D printing, lasercutting, CNC milling, and thermoforming, resulting in a final garment for the human body. The class is offered to both fashion and architecture students and the investigations occur in teams of two where ideally one from each discipline is represented. Credit 3 units.

A46 ARCH 408M Atmospheric Animations
This course explores the capacity of modifying perception, as a way of thinking and making in design process. We recognize the ambient context of a design situation 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 408N Mapping Complex Spatial Sequences
New methods of spatial practice have changed the way architects and designers work. As designers, we are no longer tied to static, projection-based drawings as a means to develop and represent our ideas. Time-based digital imaging allows us to simultaneously examine the narrative, formal, experiential and spatial aspects of a particular place. Students will map a site through digital photography focusing on a specific spatial sequence much like how a director would set up a scene, moving fluidly from one space to another. During the first half of the semester, this spatial sequence will be used to create a drawing of the entire site as one multilayered composite image with particular attention to the interaction of time, space and movement. The site will then be reconstructed digitally through models or drawings, using the composite drawing as base. Finally, relationships between the drawing and model will be outlined resulting in a more complete experiential spatial sequence.

A46 ARCH 408P Building Performance for a Solar Powered House
We will study the state of the art of building integrated solar systems, and design such a system for a house and assess its performance using computational tools. Topics include the fundamentals of solar energy systems, energy management, and its implications to design, either passive or active approach. The course involves building performance simulations using Ecotect, Energy+, HERS and other tools. Students will use simulation data to study the relation between design and its performance. The course will consist of lectures, review, and student projects. The course will be parallel to 2.5-D or 3-D design opportunities, including ESE 437: Sustainable Energy Systems, and EECE 428: Sustainability Exchange. Projects will involve teamwork with Engineering students of different backgrounds. The course will contribute to Team WUSTL solar decathlon with the following features: energy efficiency: passive design; high performance enclosure; net-zero energy; renewable energy; heat recovery; sustainability: water recycle; carbon neutral; lean construction; resilience: prefabricated house to mitigate natural disasters; Smartness: advanced sensors network; energy management; data visualization; human-centered living adaptability: flexible space; human comfort and perception controls to operate the house to improve productivity and health; an interdisciplinary effort for renewable energy and sustainable buildings. Credit 3 units.

A46 ARCH 408Q Fabricated Drawings
The course will focus on digital fabrication tools, techniques and image theory to uncover new methods of producing physical images. Images are built in a myriad of methods including physical media or from data. Physical images, as defined in the context of this seminar, will transcend a 2-D limitation to develop thickness. The increase to 2.5-D or 3-D opens opportunities to investigate the use of digital fabrication tools to construct images. In particular, the class will focus on the way information technology continues to have a profound effect on the way we perceive our built environment and the way we represent it. The images that surround us are becoming increasingly easy to generate through information technology. Access to technology both in terms of digital design and output affords the opportunity to reconceive the nature of images. Images are developed through analog, digital or hybrid processes. Their generation is a collaborative interaction between intuition and information processes through clearly defined rules. The scientific theoretician, Peter Galison, discusses the tension between intuition and information on the nature of images in the arts and sciences. Images reveal the intricacy of relations and knowledge, but they are simultaneous deceptive because they bypass the mathematics of pure science. The tension in the arts tends to be between the intuitive, interpretive ability of images as representation versus the image as evidence of a computation-based process. Architectural theoretician Mark Linder talks about how images in architecture are moving away from representations of something else toward a more literal and non-idealized result of a procedure. The image is literally the process of making visible the end result of an operation. Therefore, images are the evidence of the process by which they were generated. As such, the class will develop innovative processes for our digital fabrication equipment to construct images. The projects will develop new methods to use the CNC mill, laser cutters, knife plotter and 3-D printer. New tools may need to be developed and built to enable the image fabrication
A46 ARCH 409C Watercolor Painting for Architects, Urban Designers and Landscape Architects
This class will introduce students to different techniques of watercolor painting. The class will focus on teaching students the basics of material selection (paint colors, brushes, various papers), proper paint blending/mixing techniques, creation of unique color palettes, and both smooth wash techniques and painterly brush effects. Students will learn to render site plans of their own project work. There will also be an optional afternoon of pure sketching with paint. One objective is to teach students the methods to create beautiful renderings so that they may chose to apply the techniques to their final studio illustrative work (at the discretion of the student). Grades will be based upon class participation, effort, and final watercolors. Fulfills Analog elective requirement.
Credit 3 units.

A46 ARCH 4102 Lively City: Behavioral Studies & Public Space Design
During this three-day masterclass in Berlin, Germany, 20 students have the opportunity to learn about behavioral studies and the design of public spaces. Working alone and in small groups, students acquire new perspectives and skills that put people and their needs at the heart of the creative process of re-imagining and transforming cities. Livability, lively cities, public life and other concepts describing inviting, vibrant and stimulating urban environments are frequently communicated in new visions for the future of cities today. This focus on “urban life” is a direct reaction to the urban realities created in the 20th century, where increases in our standards of living and the associated city building processes have created areas in which large and increasing numbers of people have become isolated from each other, socially and geographically. Despite our new awareness for the need to plan for a shared and intensifed urban life in sustainable cities, we continue to have difficulties in understanding exactly what this “urban life” is, how much of it we truly want and need, and how we can reconcile the often conflicting and simultaneous needs of people for privacy and social stimulation. Employing the examples of University City and the Gateway Arch/Arcgrounds the class studies behavior in accessing and using defined sections of both urban areas as a way of dealing with complex urban design challenges in St. Louis. Through field studies and observations each student explores cost-effective and culturally sensitive solutions that can improve the integration of these important urban assets in the City of St. Louis. Open to all graduate students. Satisfactory completion of Arch 312 for Bachelor of Design students. Twelve hours of studio work a week.
Credit 6 units.

A46 ARCH 411 Architectural Design III (Study Abroad)
Prerequisite: satisfactory completion of Arch 311 for Bachelor of Design students. Satisfactory completion of Arch 312 for Bachelor of Science students. Twelve hours of studio work a week.
Credit 6 units.

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

A46 ARCH 419 Architectural Design III (MArch 3)
The third of a three-semester sequence of design studios. Continues examination of issues raised in ARCH 317 and ARCH 318.
Credit 6 units.

A46 ARCH 421U Urbanism: Chicago
This design research seminar focuses on the urban infrastructure and associated building trends of central Chicago, in and around the areas near the Loop. The Chicago metropolitan area is the third largest in the United States, and from 1870 until the 1950s, Chicago was America’s “second city,” surpassed in size only by New York City. It remains the densest and most “urban” of the cities of the Midwest, with many examples of complex interconnections between rail lines, highways, and various kinds of pedestrian-oriented urban environments. This seminar combines historical and field research on some of the many architectural urban design interventions in Chicago. Students choose among several topic areas to produce detailed drawings and digital models of specific urban interventions. There will likely be a publication of the work. Topic areas for digital documentation include the pedestrian relationships between transit lines and various buildings and urban complexes, including the large Millennium Park interventions by SOM and others over the Illinois Central railway lines adjacent to Lake Michigan, and Wacker Drive, a 1920s underground limited access highway along the Chicago River, and other projects. Fulfills History/Theory and Urban Issues elective requirement.
Credit 3 units.

A46 ARCH 421V Unbuilt Sert
This design research seminar will focus on the digital simulation of the unbuilt architectural design projects of Josep Lluís Sert (1901-83). This spring we will document and analyze Sert’s drawings for St. Botolph’s Chapel (1963) designed for the Boston Government Center complex with the goal of virtually “building” it. Sert practiced in Barcelona in the 1930s during the era of the Spanish Republic and later in the U.S. as both architect and planner. He was the President of CIAM (International Congresses of Modern Architecture) from 1947-56, and Dean of the Harvard Graduate School of Design from 1953-69 where he developed urban design as a discipline and academic program. The chapel was an effort to combine elements of Catalan modern architecture with his concept of a modern “New Monumentality” suitable to the postwar world. The seminar will also visit several of Sert’s major built projects in the Boston area, and will include presentations by Dean Emeritus Edward Baum, who was job captain on the St. Botolph’s chapel project with the Sert, Jackson firm. Students will work in teams to produce detailed digital models of the project to simulate the “built” chapel inside and out. Publication of the work is anticipated.
Credit 3 units. Arch: GACS
A46 ARCH 422H Urban Topographies
This digital seminar introduces students to the basics of geospatial modeling at both regional and local scales, with an emphasis on the creative application of GIS data toward design thinking, site analysis, and speculative urban design. The course explores the potential for GIS data as more than just for inventory and mapmaking, but also as an invaluable creative design tool. A series of digital workshops will touch on a range of cross-platform workflows, from digital cartography to parametric modeling to 3-D animation. Tying this together will be a speculative urban landscape project that the students will model and visualize utilizing the software introduced. This year's iteration will lean more toward an experimental and explorative use of GIS for design, art, and visualization. This course is intended to give students the flexibility to approach the syllabus as an independent study or as a supplement to their studio work. Software that will be covered includes ArcGIS, Autodesk Infraworks, 3DSMax and Grasshopper.
Credit 3 units.

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 423D Videography for Designers
This seminar course examines the practice of capturing, producing and analyzing moving images as a method of inquiry for design. We focus on the analytical and communicative qualities of time-based media (recorded sequences, video, slideshows, animation, simulation, remote sensing, etc.) as a human-landscape intermediary that has the ability to alter understanding and evaluation of the environment. We explore techniques from a range of disciplines — art, design, sociology, anthropology, etc. The course meets weekly for brief lectures/presentations to direct our inquiries, discussion of foundational readings and ideas, media workshops, screenings, local field trips, and/or student presentations of work. Throughout the semester, students generate brief, exploratory work that focuses on methods and techniques, and a larger, final project that engages the themes of the course. Open to all graduate and upper-level undergraduate students, a goal of the course is to blur boundaries between art and design, and to capitalize on their various approaches. No experience with video, animation, or other software is required — only the desire to explore and incorporate time-based methods into individual processes. Same as A46 LAND 423D
Credit 3 units.

A46 ARCH 424 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 4280 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 4288 Architectural History III: Advanced Theory
The third survey class focuses on architectural history and theory after modernism. It examines the rise of architectural theory as a field of inquiry and its links to both critical social theory — including the Frankfurt School — and to contemporary traits of philosophical postmodernity. From the contextual questions of meaning and memory to the examination of post-structuralism, cultural theory and identity politics — including race, gender and ethnicity — the course uses primary textual sources to illuminate drawings, buildings and ideas that defined this seminal moment in architectural history. While the course closely examines this time period of intense search for a new visual language, it also probes contemporary complexities of architecture’s continued search for visual and social purpose in an increasingly interconnected world.
Credit 3 units. Arch: GARW, HT

A46 ARCH 430A Special Topics: Oceanic Grounds: Representing the Deep Sea
The myth and materiality of the deep sea — its darkness, depth, buoyancy — has historically rendered it extra-geographic, placing it outside the realm of representation. Yet today, oceans are being transformed and take on new visibility and currency through their commercialization, politization and legislation. As the sites of globalized industry and transport, oceanic territories are active spaces of public encounter, shared inhabitation, and
A46 ARCH 430B Special Topics: Reality Capture and Design Process (lasers + drones + perception)

We are on the very cusp of a revolution that introduced a widespread integration of autonomous robotics in processes that are associated with design and construction. This shift, that despite its various connotations, is not here to render knowledge, skill and experience as obsolete, but to supplement a specific set of tedious and repetitive tasks that are often regarded as the very core of lost productivity or inability to truly capture built environment. Today’s design and construction industry is plagued with inefficiencies starting with contractual agreements, interoperability challenges, completeness of documents, procurement practices, resource planning, inefficient use of equipment and energy on construction sites, and fluctuating costs of materials. The acknowledgment of these inefficiencies creates a suitable environment for the introduction of low cost technological solutions that if implemented correctly can alter the existing dynamic of project delivery. Since 2010, we have witnessed a proliferation of UAVs associated with the reduced cost of their accessibility while pioneering design, engineering and construction companies were investigating how to weave them into their existing processes. The not so apparent drawback of this line of reasoning is in its inability to tap into the full potential of robotics and AI, thus concealing the ability of new technology to impact the symbiotic relationship between design thinking and omnipresent sensory experience and analysis. Through the exposure to information obtained via reality capture technology and its associated processes of laser scanning, photogrammetry and multispectral analysis, the students will be confronted with several speculative scenarios. Each of these scenarios will take into account virtual quality of captured environment and its temporal reference, while trying to understand how navigate through the concepts of Big Data and universal connectivity. Manipulation of virtual matter and examination of its properties could lead to the capture of movement through time and juxtaposition of its inherent quality with reimagined material presence of the new design. The journey that starts with something as simple as defining the origin of a new synthetic environment and designers ability to operate required technology.

Credit 3 units.

A46 ARCH 430C Special Topics: Architectural Sketching

An introduction to architectural sketching — a graphic communication skill that architects and designers use to analyze and document their environments, and to visualize design thinking and creative process. Many class sessions will meet on-site, drawing directly from observation. The first part of the semester will focus on fundamentals of sketching through the study of existing buildings, their contexts and interiors. Students will expand and refine their observation skills as they use the architectural sketch as a mode of research — exploring elements of architecture: form, material, light; and the relationships between building and context, and building and interior. The second part of the semester will expand to include the architectural sketch as language. Students will learn to use the architectural sketch to explore, confront, develop and translate abstract ideas into visual narrative, creating a record of design thinking and creative process. Prerequisite: Drawing I (X10 XCORE 101) or graduate architecture standing.

Credit 3 units.

A46 ARCH 430D Special Topics: Making A Net Zero Energy House

This course will study the state of the art of net zero energy houses of different climates. Topics include introductory the fundamentals of passive and active solar energy systems, daylighting strategy, energy balance and management for home, and the roles of different types of enclosure, fenestration, solar system, and energy storage, as well as the analysis, integration and optimization of energy systems in a net zero energy house. The course involves climate analysis, building performance simulations based on Design Builder, HERS rating, and carbon footprint assessment. Students will take a large quantity of data analysis to understand the relations between design strategies and performance. The course will consist of lectures, review and discussion of literature, and student projects. The course will contribute to Team WUSTL solar decathlon project, a showcases the integration of reliable cutting-edge and proven technologies in a sustainable way.

Credit 3 units. EN: H
allow for deeper analysis of and communication about life in the Renaissance city.
Credit 3 units. Arch: GARW, HT

A46 ARCH 435E Furnish It, With Pieces
Public space is a key constituent that determines the character of a neighborhood and a city. It is embedded in the urban fabric and it can mediate the relationship between people and their particular surrounding landscape. Urban furniture and hardscape can play an important role in offering a wide range of uses for public spaces. The design of such pieces affects the way people live and experience a particular environment. The ultimate goal of this course is to design, fabricate and install a set of repeatable units to equip a vacant urban lot in order to offer opportunities for social interaction. The seminar focuses on the in-depth understanding and development of ideas based on the technical, experiential and aesthetic exploration of one material: concrete, into one specific application: urban furniture. This seminar builds up on the scope of the Creative Activity Research Grant awarded by the Sam Fox School of Design & Visual Arts where five porous concrete pavers were designed for a vacant plot in North St. Louis. The challenges are: to adapt the given pavers to a new site condition and to propose new urban furniture made out of concrete. It involves the construction of pieces able to equip a gathering space as well as sidewalks that can offer local residents the opportunity to interact with others. This provides not only aesthetic appeal to the residents and visitors, but also allows the possibility of implementing an actual project in an abandoned lot in Old North. We will enrich the community with a wide range of training opportunities as each step in the process of making the plaza is used for teaching purposes, from making pavers and other pieces, to salvaging, reusing or repurposing recycled material. Students are asked to design and build concrete urban furniture necessary for the gathering area. The pieces can encompass a wide range of uses: chairs and benches, tables, raised beds, planters, litter bins, modular fencing and mobility-related pieces such as bike racks, bollards and car stoppers. This is an opportunity for hands-on experience. These pieces have to consider the limitations of the material in terms of strength, weight, size, etc.; learning about the material itself as well as the act of construction, assemblage and mass production, which includes methods and technology, ranging from tools to molds. The formwork for the concrete pieces will be built through a process of CNC milling and rubber molds or vacuum formed plastic. The challenge of the third part of this course 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. Construction is the ultimate goal of this class. We work in collaboration with Anova, a local manufacturing company dedicated to the design and production of site furnishings. Anova provides some materials and brings their expertise to the project.
Credit 3 units.

A46 ARCH 4362 Advanced Grasshopper
With a base knowledge of the Rhino+Grasshopper interface, this class will focus on developing an entirely scripted building system. Each student will be given a set of initial parameters (building volume, square footage, percent of transparent/opaque facade, required programmatic elements/size, etc.). They will begin by selecting a formal precedent that will help them determine a structural system. Within this framework, students will develop an algorithmic logic to organize program and then articulate a responsive skin. The goal of this exercise will be to develop understanding of the potential use of scripting in design. Scripting allows the designer to transform their design dynamically as the parameters change or update. The final output of this class will be detailed, annotated drawings of each student's structural system as well as a 1/4" scale model of a small portion of their design utilizing available tools in the FabLab such as 3-D printing and CNC routing. Students taking this course must have a working knowledge of Grasshopper. This class is an advanced class exploring design through generative modeling.
Credit 3 units.

A46 ARCH 436A Information Modeling and Technology
This foundation-level course will introduce students to the digital tools of Geographic Information System (GIS), Building Information Modeling (BIM), and Building Performance Analysis (BPA). Its goal is to train the student with the ability to gather information, analyze it, and make decisions within the information-rich environment of architectural design and construction. Students will develop an understanding of these three seemingly distinct approaches and their role in preserving the quality and quantity of accumulated information for "upstream" use. The topics addressed in the course will be further developed in more advanced courses during subsequent semesters. The introduction of information-gathering principles within GIS will expose students to the wealth of information, such as maps and census data, that is already available, as well as methods of turning raw data into analytical material for use in their design work. This segment of the course not only provides a foundation for ArcGIS, but also leads toward use of this information within applications like Revit Architecture. Creating and managing an information pool of digital GIS and design and construction data and making it available throughout the lifecycle of a project is commonly referred to as BIM. In the second part of this course, we will explore how BIM is being utilized today and learn the basics of one of the leading BIM-compliant applications, Autodesk Revit Architecture 2010. During the third part of this course, students will be introduced to BPA, a process that embodies a holistic approach toward the integration of sustainability and design. By understanding when and how to apply sets of analytical exercises via applications like Ecotact Analysis within the context of Information Modeling, students will develop an understanding of how design decisions have a profound and lasting impact on the overall building sustainability and performance.
Credit 3 units.

A46 ARCH 436B BIM in Practice
Building Information Modeling (BIM) is a developing method of creating, sharing and managing project data through a visualized 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.
the design process, and its relationship to architectural form. The class places an emphasis on each student developing their context, including environmental, material and spatial realms. The relationship between buildings and an expanded idea of context, including environmental, material and spatial realms, is often at odds with established methodologies of design. Current practice typically manages this schism by separating design from the use of BIM for documentation and construction. The class will seek to develop methods of design within a BIM environment, not through the translation or reshaping of traditional techniques, but through the design of a methodology that seeks to capitalize on what BIM enables: direct, digital collaboration and the facile management of large data sets. This is not an introductory class. Basic knowledge in Revit (or an alternative BIM software) is required. Skill in other parametric and 3-D modeling software as well as a basic knowledge of Grasshopper or other algorithmic processes is strongly preferred. Students will investigate and design digital processes using a short design brief to enable the investigation.

Credit 3 units.

A46 ARCH 436E Technology + Tectonic
Beginning with a rigorous study of three-dimensional grid systems, students will work in pairs to develop conceptual proposals for site-specific hanging installation. Students will examine materiality, grid distortions, and spatial qualities, as well as interactions with natural light and human input. The ideas generated in this course have the potential to directly affect an architectural installation the following semester. Students enrolling in the course should have completed at least one digital seminar as a prerequisite.

Credit 3 units.

A46 ARCH 438 Environmental Systems I
Environmental Systems I is the foundation course in the architectural technology sequence. This course addresses the relationship between buildings and an expanded idea of context, including ideas of environment, landform, energy, material and space. The class places an emphasis on each student developing their own attitude toward architectural sustainability, its role within the design process, and its relationship to architectural form. The class is organized around the themes of climate, site and energy. The theme of climate addresses macro- and micro-climates, and the roles they have in developing architectural form through "passive" strategies. The theme of site expands the idea of the architectural project to examine landform, position, access and region. The theme of energy looks at architecture as both embodied energy and a consumer of energy, to understand how the architect helps to control and direct these flows at macro and micro levels. Two goals for the class are to provide students with ways of thinking about and of working with issues of sustainability, which can inform their design practice, and to equip students with the basic knowledge needed to continue within the technology sequence. Only students who have received a partial waiver for A46 438 Environmental Systems I may register for this course.

Credit 1 unit.

A46 ARCH 439 Environmental Systems II
We as architects have to analyze and address complex issues and relationships, synthesize them, and then make them manifest through clear design strategies. Building systems must reconcile: solar heat gain, glare control, daylight levels, thermal insulation, ventilation, acoustics, air quality, structure and fabrication — all in relation to the scale and comfort of the human body. The development of environmental systems into a clear, comprehensive, and elegant design solution cannot be an afterthought; it must be a synthesized and integral part of the design process, with a clear strategy that operates at multiple scales. Building upon the passive strategies explored in Environmental Systems I, this course will lay the foundation for the integration of active environmental systems with enclosure, space, and the requirements for human occupation. This will be done through the study of climate, air, temperature, water, light, sound and energy. Each topic will be assessed against problems, principles, possibilities and potential. This course focuses on how important it is to consider active systems as part of an integrated design strategy addressing both form and performance throughout the design process. Prerequisites: Environmental Systems I & Building Systems I.

Credit 3 units.

A46 ARCH 4391 Environmental Systems II: Acoustics
The Acoustics Workshop is designed for students that have been partially waived from Environmental Systems II with the exception of the acoustics portion. The workshop joins the Environmental Systems II class for only the lectures on the topic of acoustics. The class will cover the design of acoustic environments starting from the physics of sound, the design room acoustics, identifying noises sources, and investigating methods for noise mitigation.

Credit 1 unit.

A46 ARCH 439H Environmental Systems II (Berlin)
We as architects have to analyze and address complex issues and relationships, synthesize them, and then make them manifest through clear design strategies. Building systems must reconcile: solar heat gain, glare control, daylight levels, thermal insulation, ventilation, acoustics, air quality, structure and fabrication — all in relation to the scale and comfort of the human body. The development of environmental systems into a clear, comprehensive, and elegant design solution cannot be an afterthought; it must be a synthesized and integral part of the design process, with a clear strategy that operates at multiple scales. Building upon the passive strategies explored in Environmental Systems I, this course will lay the foundation for the integration of active environmental systems with enclosure, space, and the requirements for human occupation. This will be done through the study of climate, air, temperature, water, light, sound and energy. Each topic will be assessed against problems, principles, possibilities and potential. This course focuses on how important it is to consider active systems as part of an integrated design strategy addressing both form and

A46 ARCH 439 Environmental Systems II

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The advent of modernist landscape principles and techniques in the canonical Zen gardens from Japan's early modern period, the cyclical reconstruction of Ise Shrine that took place in 2013, Japan during successive historical periods. We will look at the plantings, views, and architecture were seen and imagined in and technology to inform us of how earth, water, air, winds, be inter-disciplinary, using literature, art, religion, economics, and technology to inform us of how earth, water, air, winds, plantings, views, and architecture were seen and imagined in Japan during successive historical periods. We will look at the cyclical reconstruction of Ise Shrine that took place in 2013, canonical Zen gardens from Japan's early modern period, the advent of modernist landscape principles and techniques in the 20th century, as well as the influence of garden aesthetics on the development of architecture and urban design over time. This course is open to qualified undergraduates. It is also offered as a Methods seminar for undergraduates in the Architectural History minor and fulfills the History and Theory requirement for Master of Architecture students. The maximum enrollment for this course will be 12.

A46 ARCH 445 Building Systems
Building Systems will examine the performance and properties of building materials, both traditional and new, through an analysis of assemblies and related systems. Investigations of wood, masonry, steel and concrete and the integration of relevant building systems will provide the fundamental structure for the course. All systems will be investigated relative to their architectural purpose, impact on the environment, relationship to culture/context, technical principles and will also consider manufacturing, construction, our profession and the society in which we practice. Moreover, the course will also examine the performance characteristics of contemporary enclosure technology and explore the impact these technologies are having on design thinking. Although we will focus primarily on the aforementioned topics, we will also identify and consider the impact of other parameters on design and performance such as: building codes, role of the profession, health and life safety, systems integration, sustainability and industry standards. The course strives to provide students with a sound familiarity and understanding of traditional building systems in wood, steel and concrete; as well as the skills necessary to represent these systems. The course also seeks to expose students to the material and poetic potential of these technologies related to the making of architectural environments.

Credit 3 units.

A46 ARCH 447A Structures I
Statics and strength of materials through beam and column theory. Loads are defined and states of stress are identified and analyzed. The context of structural behavior is identified and optimal structural behavior and material efficiency structural design is reviewed. Form-active, bulk-active and vector-active structural options are explored relative to the transference of load along the length of structural members. The course applies structural theory to the analysis and design of structural members — beams, trusses, arches and columns.

Credit 3 units.

A46 ARCH 448A Structures II
Continuation of Arch 447A with consideration of the effects of forces on structural members of various materials. Introduction to the design of structural members in steel, reinforced concrete and wood. Prerequisite: Arch 447A.

Credit 3 units.

A46 ARCH 452K The Ambiguity of Scale: Japan’s Landscape Tradition
Modernist architects in Japan, particularly those associated with the Metabolist Movement, often used the term "niwa," literally gardens, to describe their urban design projects. The city, land, and sea were both the setting and the object of design interventions. This course will examine the Japanese landscape tradition from antiquity to the 21st century. The approach will be inter-disciplinary, using literature, art, religion, economics, and technology to inform us of how earth, water, air, winds, plantings, views, and architecture were seen and imagined in Japan during successive historical periods. We will look at the cyclical reconstruction of Ise Shrine that took place in 2013, canonical Zen gardens from Japan's early modern period, the advent of modernist landscape principles and techniques in the 20th century, as well as the influence of garden aesthetics on the development of architecture and urban design over time. This course is open to qualified undergraduates. It is also offered as a Methods seminar for undergraduates in the Architectural History minor and fulfills the History and Theory requirement for Master of Architecture students. The maximum enrollment for this course will be 12.

Credit 3 units.

A46 ARCH 452L The Japanese House
This seminar examines the Japanese house as a modernist idea as it evolved over the course of the 20th century, both within Japan and internationally. The single-family, “tofu-cutter” house came to define Japan’s suburban, industrialized landscape in the postwar era, but the type historically emerged out of a certain modernist imagination of Japan’s premodern architecture, as architects and critics such as Bruno Taut and Arthur Drexler projected their specific readings of shoin and minka architecture onto a mandate for contemporary practice. The seminar will investigate major strains of domestic architectural design in postwar Japan, paying particular attention to the formalist exercises of Shinkohara Kazuo and technology-driven designs of Ikebe Kiyoshi. More contemporary pursuits by SANAA and Atelier Bow-Wow in materiality, transparency, smallness and urban complexities will also be covered. This course satisfies the History/Theory elective requirement.

Credit 3 units.

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

Credit 3 units. Arch: GACS, HT

A46 ARCH 455A Urban Books
Since the beginning of the 20th century, art, architecture, and urbanism together have investigated the production of images

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

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

A46 ARCH 457B Segregation by Design: A Historical Analysis of the Impact of Planning and Policy in St. Louis
This transdisciplinary seminar, bridging humanities and architecture, introduces students to research, theories and debates currently being conducted on issues of segregation, urban policy and sustainability. By placing these debates in a historical and local context students will discover how policy and decisions are entrenched with racial, cultural, physical and socioeconomic segregation, and create the spatial transformation of America’s divided cities. Students will learn to evaluate and analyze policy and planning through the framework of Triple Bottom Line Sustainability to understand the physical manifestation of segregation during growth and decline. CET (http://www.gephardtinstitute.wustl.edu/cec) course. Credit 3 units. Arch: GACS, HT EN: S

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

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

A46 ARCH 462N Constructing Ideas
Constructing Ideas is about creating design concepts and transforming these into built architecture. We will learn how conscious imagination and coherent interventions lead us to ideal realities. This class examines the design and construction process as academic research. We consider the practice of making architecture as a synthesis of analysis, interpretation and transformation. Studies will teach us how a building idea influences its construction and how the knowledge about construction can become the starting-point of an idea. Interrogating design problems and investigating existing typologies as a methodology will lead us to specific answers. We will explore conceptual-artist practices and examine their strategies, learning to lead with intent, play with parameters and question the givens. From there, we will look at examples of Swiss architecture whose early integration of construction in the design process has a long tradition. One could say that
A46 ARCH 463B Emergent Urbanisms

This course surveys emergent models of urbanization in globalizing cities that thus far defy categorization or exist primarily in stages 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. Emerging urban assemblages include: massive manufacturing infrastructure, warehouse land, and logistics 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. Credit 3 units.

A46 ARCH 463C Invisible Cities

This graduate and advanced undergraduate seminar takes as a point of departure the famous 1972 Italo Calvino text that reframes a single city (Venice) as multiple cities, told through a sequence of discrete narratives and descriptions. Each of Calvino’s invisible “cities” reflect different emotional and physical environments and possibilities — or impossibilities — for their inhabitants, yet are all still connected through an overarching narrative. Invisible Cities, the course, builds on this premise that a city is not a one-size-fits-all experience (nor a monolithic construct with a uniform constituency), but instead is composed of radically different environments all selectively accessed, depending on one’s positionality or relationship to urban redevelopment processes. In places like St. Louis, but in fact in all American cities — residents live out different urban realities or imaginaries, with unequal access to the same services, provisions and processes. A highly visible instance of this occurs along Delmar Blvd in St. Louis where two contrasting lived experiences play out in neighborhoods across from each other on the north-south divide. But this class posits that much less visible instances of the duplicitous city also exist, in spaces not geographically divided, but (more insidiously) overlaid. The course will focus on this conceptualization of inequality where both privileged and underserved populations co-exist in much more intertwined ways. Within any given block, neighbors live according to different opportunities, for education, health access, police services, or routes to property acquisition and financing. These are the invisible, spatially simultaneous cities; the urban realities that are much harder to see — at least to those who do not live those realities on a day-to-day basis.

Like in Calvino’s world, urban and lived space is endlessly continuous and accessible for some; for others it is fragmented, even disorienting or opaque. This course will examine, frame, collect and document the various manifestations of invisibility together with the political instruments and policies that produce — and reproduce — it. We will use the St. Louis region as our primary focus, with comparisons to other sites. Our studies will involve a close re/reading of many of the mechanisms of daily governance and urban design such as policies, planning tools, legal, financial and real estate protocols and of course design decisions and processes; i.e., the apparatuses of urban redevelopment that exist right before our eyes. The seminar welcomes both graduate students and advanced undergraduate students from across disciplines. Support for Invisible Cities is provided by the Washington University in St. Louis Ferguson Academic Seed Grant Program granted through the Offices of the Chancellor and Provost and the Olin Business School. Fulfills Urban Issues and MUD Track elective requirement. Credit 3 units. Arch: GAMUD, GAUI, UI

A46 ARCH 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: parallax, lighting, lens distortion, depth of field, format and grain, cropping, photomontage and point of view. Fulfills history/theory requirement. Credit 3 units.

A46 ARCH 465C Art, Design and Entrepreneurship: Creative Placemaking Beyond The City

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

A46 ARCH 471A Continuity and Transformation
Throughout history and across cultures, certain ideas, concepts and organizational strategies have persisted in architecture, despite advances in social ideals and technological capabilities. The seminar explores the phenomenon of this continuity with the goal of uncovering the manner in which these ideas and strategies are transformed. Whether classified by use, characteristic form or compositional device, the continuity of these notions is clearly traceable as a body of knowledge waiting to be revealed, understood, assessed and, when valid, built upon. The transformation of ideas and strategies is one of the most fundamental activities of the designer, but relies on careful study. We discover evidence of this phenomenon in vernacular architecture, patterns of settlement and habitation, and in the work on many of our most influential practitioners, such as Le Corbusier, Kahn, Moneo and Zumthor, as well as in the realm of painting and sculpture including Cubism, Suprematism and Expressionism.
Credit 3 units.

A46 ARCH 472 Sustainable Development
This seminar is an introduction to the basics of small- to medium-scale development. It will begin with a series of introductory lectures covering the principles and tools of development, such as creating a project performa, basic tax credits, TIFs, and financial structuring of a project; exploring methods of implementing sustainable practices and designs into development-driven projects through marketability, cost-savings, tax credits and other incentives; and investigating the process of real estate development through the use of sustainable ideas and practices in buildings. It will continue with a series of case studies in which the class will examine models of existing developers in terms of these base elements. Finally, students will be asked to develop a project in order to understand the architect-client relationship and how to stimulate recognition of the value and importance of sustainable design in real estate development.
Credit 3 units.

A46 ARCH 475D Landscapes Through Time: The History of St. Louis’ Built Environment
From the Mississippian mound builders to the urban conditions of the present day, this course will investigate the different approaches of various cultures to creating built environments that meet the needs of their time in terms of landscapes and structures. Using the City of St. Louis as an example, the course will examine the layout and infrastructure of the city at various periods, discussing the effects of technological changes in the creation of structures, improvements to transportation, facilitation of trade and the effects of these forces on the cultural and built landscape of the city. Each class session will discuss the structures and landscapes that defined individual eras in the history of the city, and the ways in which these were successful or unsuccessful. This course fulfills the History/Theory elective requirement.
Credit 3 units. Arch: GACS, HT

A46 ARCH 475E History of the Modern Art Museum
This seminar explores the development of the modern art museum as an architectural type, measured against evolving nature of display objects, curatorial practices, and demands of the viewing public. Since the consolidation of the type in the early 19th century, the art museum has been the primary site where the symbiotic trajectories between artistic and architectural development have played out. Also to be examined is the importation of this program into non-Western countries, which responded with their own canons and classifications of fine art. The course ends with recent case studies where architecture has made new, often aggressive, commentaries on objects it is designed to display. The course is open to graduate students and advanced undergraduate architectural history minors. Fulfills History/Theory elective requirement.
Credit 3 units. Arch: GARW, HT

A46 ARCH 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 486A NOMA National Design Competition
This course allows students to work collaboratively to develop a comprehensive body of work (including presentation boards, physical models, and animated digital graphics) in response to the National Organization of Minority Architects’ (NOMA) Barbara G. Laurie Annual Student Design Competition. Students work in pairs to develop thorough schematic-level solutions. After the midterm review, the class selects the strongest overall team project and uses that as a basis to develop highly detailed plans, elevations, sections, details, 3-D views (animation optional), cultural, sustainable, and accessibility design concepts. Not only does this activity culminate into a final review, but students submit and formally present their design solution at the annual NOMA Conference: http://www.noma.net/. CET (http://www.gephardtinstitute.wustl.edu/cec) course.
Credit 3 units.
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 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 variable, maximum 2 units.

A46 ARCH 489 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
Principal Esperanza Veal of Henry Elementary School is creating a remarkable place for her students who live in the neighborhood of the Cochran Gardens Federal Housing Project in downtown St. Louis. Principal Veal is clear in her conviction to provide each of her students with both literal and academic nourishment, and is working unceasingly to make the Henry School a safe and creative oasis for children ages pre-school through grade six. Her goal is to have the Henry Elementary School students be self-motivated, serious about learning and creative about life in the 21st century. To this end we will emphasize ecological sustainability, environmental health, personal responsibility, leadership and a comprehensive, high quality academic program. With an emphasis on the environmental sciences, energy alternatives and conservation, recycling, organic gardening and the food sciences, and the emerging “green” economy, students will focus on developing the math, science, writing, and hands-on skills that will make them successful leaders to make a difference in improving the environment for humanity. This course invites undergraduate and graduate students from different fields of study to apply their discipline to the goal of designing and teaching hands-on problem-solving projects for students at the Henry Elementary St. Louis Public School, located across the street from Cochran Gardens Housing, at 1220 N. 10th Street. Gay Lorberbaum, with advising from Principal Veal, will work individually with each Washington University student to develop the right fit between the creative contribution each Washington University student wants to offer and the vision Principal Veal has for each age group of students at Henry Elementary School. Students enrolled in this course will work on-site at Henry Elementary School during the scheduled meeting times. The will be an additional meeting on campus for one hour on Wednesdays at a time to be determined later by the enrolled students. CET (http://www.gephardtinstitute.wustl.edu/cec) course. Credit 3 units.

A46 ARCH 499 Senior Capstone in Architecture
The Senior Capstone in Architecture allows undergraduate students in their final semester of study to pursue individual research projects. All students will participate in shared discussions and presentations, as well as pursue a highly individualized line of research inquiry that potentially starts where a former project left off, supplementing current or previous course work, or investigating a previously unexplored route. The course will culminate in a presentation and defense of a well articulated and developed research project. Credit 3 units.

Landscape Architecture

A48 LAND 401 Landscape Architecture Design Studio I
This core studio explores design principles common to architecture and landscape architecture as well as their own specificity. A series of problems focuses on the relation of component to space through conceptual, analytical, formal and perceptual investigations. Credit 6 units.

A48 LAND 402 Landscape Architecture Design Studio II
In this core studio course, students develop a spatial understanding of landscape architecture through a series of exercises of varying scale and complexity. Building design skills incrementally, students acquire facility with the manipulation of ground plane and the elaboration of vegetation and material strategies at both site and urban scales. The studio fosters an appreciation of landscape architecture as a systemic construct with formal, ecological and social implications. Credit 6 units.

A48 LAND 421 Landscape Representation I: Hand Drafting, Drawing and Sketching
The beginning course in the representation sequence introduces students to freehand and mechanical representation as a means for developing and communicating design ideas. Students build a basic understanding of orthographic drawing typologies and traditional drawing materials. Emphasis is placed on development of observational skills, building a design vocabulary, basic drawing skills, and the techniques of landscape architecture and architectural representation. Credit 3 units.

A48 LAND 423D Videography for Designers
This seminar course examines the practice of capturing, producing and analyzing moving images as a method of inquiry for design. We focus on the analytical and communicative
qualities of time-based media (recorded sequences, video, slideshows, animation, simulation, remote sensing, etc.) as a human-landscape intermediary that has the ability to alter understanding and evaluation of the environment. We explore techniques from a range of disciplines — art, design, sociology, anthropology, etc. The course meets weekly for brief lectures/presentations to direct our inquiries, discussion of foundational readings and ideas, media workshops, screenings, local field trips, and/or student presentations of work. Throughout the semester, students generate brief, exploratory work that focuses on methods and techniques, and a larger, final project that engages the themes of the course. Open to all graduate and upper-level undergraduate students, a goal of the course is to blur boundaries between art and design, and to capitalize on their various approaches. No experience with video, animation or other software is required — only the desire to explore and incorporate time-based methods into individual processes. Credit 3 units.

A48 LAND 430E Special Topics: Solar Decathlon Landscape Strategy
A solar decathlon house is currently being designed and constructed by Sam Fox architecture students for entry into the 2017 competition to be held in Denver, Colorado. This summer landscape architecture studio will develop the design and construction drawings for the high-performance landscape system that sustains the house. It will provide energy, light, water and food. Credit 3 units.

A48 LAND 452K The Ambiguity of Scale: Japan's Landscape Tradition
Modernist architects in Japan, particularly those associated with the Metabolist Movement, often used the term “niwa,” literally gardens, to describe their urban design projects. The city, land, and sea were both the setting and the object of design interventions. This course will examine the Japanese landscape tradition from antiquity to the 21st century. The approach will be inter-disciplinary, using literature, art, religion, economics, and technology to inform us of how earth, water, air, winds, plantings, views, and architecture were seen and imagined in Japan during successive historical periods. We will look at the cyclical reconstruction of Ise Shrine that took place in 2013, canonical Zen gardens from Japan's early modern period, the advent of modernist landscape principles and techniques in the 20th century, as well as the influence of garden aesthetics on the development of architecture and urban design over time. This course is open to qualified undergraduates. It is also offered as a Methods seminar for undergraduates in the Architectural History minor and fulfills the History and Theory requirement for Master of Architecture students. The maximum enrollment for this course will be 12. Same as A46 ARCH 452K Credit 3 units.

A48 LAND 453 Advanced Planting Design
This course focuses on both the cultural, environmental, scientific and the technical aspects of planting design. The course is taught in three modular sessions: horticulture and the science of plants; typologies and design such as bosque, grove, glade, alleé, meadow, wetlands, hedgerow, etc., and their origins in productive landscapes, application to contemporary landscape architecture; and the practical hands-on experience in the field with both design documentation to installation techniques. The course offers several field trips to experience urban revitalization, various design typologies, sustainable land use, reclamation and restoration. Credit 3 units.

A48 LAND 480B Mapping the Metropolitan Mississippi
This seminar explores the relationship of city to river through reading, recording and mapping. Students document their research, create proposals and develop simulations and/or prototypes for a site on the St. Louis riverfront. Methods of inquiry combine hand-recording, photography, GIS techniques and DIY devices. The course alternates discussion sessions, field research and lab. Open to all graduate students; undergraduates require the instructor’s approval. Credit 3 units.

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