The goal of this 2-year program of Design Studio/Seminars/Research is to give students a strong, comprehensive and broad understanding of architecture, design, and engineering in the context of our present world. The program will focus on integration of design + engineering, design methods, history, creative thinking, and research while requiring students to realize designs individually as well as working in teams. The program seeks to reinforce creative engineering for future engineers or lead to a Masters in Architecture at an Architecture Graduate Program.

1. **History**
A few informal history discussions will begin developing a value system by identifying and judging the best buildings that will help decision-making. History of architectural design will seek to develop methodologies and process for useful work approaches.

2. **Urbanization**
Using the development of Chicago infrastructure and architecture since 1850, students will gain an understanding of the forces at work in our environment.

3. **Integrated Design Studio**
Design exercises will require students to create buildings ranging from simple to complex; developing graphic and modeling skills, three dimensional representation, energy analysis, design thinking, structure, and mechanical concepts. Graphic and verbal presentations will be required.

4. **Teamwork**
The complexity of our modern world requires teams of professionals to work together to address building design. A one-week team project with Stanford AE+D students over the internet in second quarter is followed by a third quarter team project for the design of a tall building.

5. **Structural Engineering**
Professors from Engineering will interact with the studio design work with engineering analysis and calculations of engineering aspects of the design solutions.

6. **Building Information Modeling, Sustainability, and Energy Modeling**
Student Designs will be developed using REVIT (a BIM platform) followed by energy simulations using EQUEST (an energy modeling platform).

7. **Free-Hand Drawing**
Students will develop their individual skills of free-hand drawing that will enable them to see, communicate, and to conceptualize. Students will execute several assignments in an iterative process that sharpens their design drawing communication.

8. **Seminars/Lectures**
Practicing professionals will present case studies of architectural, engineering, contracting, management, and development, that will provide the student with a foundation; for understanding the complexity of architectural practice; and a general appreciation of the modern design world.

9. **Readings and Reports**
Various reading assignments, group discussions and reports.
### Northwestern Architecture Engineering & Design  
**CIV_ENV 385-1**  

**SEMINAR / STUDIO APPROACH: SEPTEMBER 2017 - DECEMBER 2017**  

**Quarter 1**  
**Class Meets:** Tu/Th 3:00pm – 4:50pm  
**Instructors:** Larry Booth, Mark Sexton, Joy Meek and Scott Cyphers  
**Class Hours:** 40 hrs. Lectures, Seminars, Field Trips, Critiques and Presentations  
  
164 hrs. minimum student time  

<table>
<thead>
<tr>
<th>Date</th>
<th>Instructor</th>
<th>Course Topic</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>Tu 9/19</td>
<td>LB/SC/MS/JM</td>
<td>Lecture: Course Introduction</td>
<td>Class introductions, assign studio project and review Housing Benchmarks</td>
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<td>Site Visit - measurement and analysis</td>
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<td>Tu 9/26</td>
<td>Don Semple - K+S</td>
<td>Lecture: Rhino Software</td>
<td>In class Rhino training and techniques in L441</td>
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<td>• Load Rhino trial version on your laptops</td>
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<td>Th 9/28</td>
<td>SC</td>
<td>BIM1: Revit Intro + Techniques 1</td>
<td>BIM drawing exercises in TECH computer lab (MG47)</td>
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<tr>
<td>Tu 10/03</td>
<td>LB/SC/MS/JM</td>
<td>Lecture: Design Approaches + Program</td>
<td>Booth discusses the architectural design process</td>
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<td>• Graphic Program hand drawn to scale with furniture</td>
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<td>• Site Analysis indicating context factors</td>
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<tr>
<td>Th 10/05</td>
<td>LB/SC/JM</td>
<td>Critiques: 3 Concepts</td>
<td>Group reviews</td>
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<td>• 3 different “Architectural Concepts” hand drawn to scale</td>
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<tr>
<td>Tu 10/10</td>
<td>Tom Leslie - Iowa State</td>
<td>Lecture: Chicago Architecture</td>
<td>Lecture on origins of Chicago Tall Buildings.</td>
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<td>Th 10/12</td>
<td>LB/SC/JM</td>
<td>Critiques: 3 Concepts Continued</td>
<td>Individual reviews of Concept development</td>
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<td>• Building site plan and floor plans hand drawn to scale</td>
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<td>• Preliminary building massing in Rhino</td>
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<td>• Leslie Synopsis due</td>
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<tr>
<td>Tu 10/17</td>
<td>Chris Rockey - Rockey Structures</td>
<td>Lecture: Residential Structural</td>
<td>Lecture on residential structures projects in Midwest</td>
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<td>• Begin work on large team site model (foam/paperboard)</td>
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<td>Th 10/19</td>
<td>LB/SC/JM</td>
<td>Critiques: Study Model</td>
<td>Group reviews of Concepts Models</td>
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<td>• Individual Concept Model (foam/paperboard) in group site model</td>
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<td>• Drawing Assignment #1 due</td>
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<tr>
<td>Tu 10/24</td>
<td>LB/SC/JM</td>
<td>Critiques: Rhino Drawings</td>
<td>Individual reviews of Concept development</td>
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<td>• Rhino Drawings – plans and perspectives</td>
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<td>• Rockey Synopsis due</td>
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| 10/26      | Lecture: Studio Project Structures         | Structures Project #1 assigned Individual reviews for structural concepts  
|            |                                            | • Structural plans and framing concepts  
| LB/SC/JM   | Critiques: Revit Drawings                  | Individual reviews of Concept Design progress for midterm  
|            |                                            | • Drawing Assignment #2 due  
| Tu 11/07   | Midterm Presentation                       | 1. Site Plan indicating surrounding buildings, streets and context.  
|            |                                            | 2. Floor Plans detailing all levels.  
|            |                                            | 3. Minimum one full building section.  
|            |                                            | 4. Minimum two perspectives – ground level and bird’s eye view.  
|            |                                            | 5. Physical model that fits into the group site model.  
|            |                                            | 6. Initial materials selection board  
|            |                                            | All drawings completed in Rhino  
|            |                                            | Drawings to fit 11 x 17 horizontal page layout with graphic scale and north arrow.  
|            |                                            | Verbal presentation to be 1-2 minutes and describe the main idea / concept.  
| Th 11/09   | Critiques: Midterm download               | Individual reviews of midterm feedback  
|            | Group Book Discussion                      | Group conversation of Conceptual Blockbusting  
|            |                                            | • Ross Barney Synopsis due  
| Tu 11/14   | BIM2: Revit Techniques 2                  | BIM drawing exercises in TECH computer lab (MG47)  
| Th 11/16   | Lecture: Model Building Techniques        | Cyphers to review physical model building techniques and skills  
|            | Lecture: Studio Project Structures        | Project #2 assigned  
|            |                                            | • Structures Project #1 due,  
| Tu 11/21   | Critiques: Floor Plans                    | Individual reviews of Concept development  
|            |                                            | • Building Floor Plans with furniture in Revit  
| Th 11/23   |                                            | Holiday - Thanksgiving  
| Tu 11/28   | Critiques: Interior Perspectives           | Group reviews  
|            |                                            | • Interior Perspective Views in Revit  
|            |                                            | • One Page Individual Book Review due  
| Th 11/30   | Critiques: Final preparation              | Individual reviews of Concept Design progress for final  
|            |                                            | • Site and Floor Plans  
|            |                                            | • Exterior and Interior Perspectives  
|            |                                            | • Material finishes  
|
Final Jury Presentation

1. Structures Project #2
2. Drawing Assignment #3
3. The required drawings are similar to Midterm. However, they should exhibit a much higher degree of quality - detail, color, shadows, materials, furniture etc.
   - Site Plan indicating surrounding buildings, streets and context.
   - Floor Plans detailing all levels. Show furniture.
   - Minimum two full building sections.
   - Minimum two exterior and three interior perspectives.
   - Final material selection board
4. Physical model that fits into the group site model.

Final drawings can be a combination of Rhino and Revit. Floor plans in Revit. All drawings to fit 11 x 17 horizontal layout with graphic scale and north arrow. Verbal presentation to be 1-2 minutes and describe the main idea / concept.
Individual Studio Design Project (65%)
- Home for Northwestern University Civil Engineering Professor and Family (2 children)
- Evanston/Northwestern Site - location of “former” Army ROTC building
- Program: 2,500 sf gross
  - Front & Backyard Landscaping
  - Note that program may be modified to accommodate individual designs
- **PROJECT GOALS: Design Thinking and Synthesizing, Critical Judgment, Graphic Skills, Digital and Spatial Visualization, Decision Making & Teamwork**

3D Modeling – Digital and Physical (10%)
- BIM1 – Architectural Drawing Conventions, Definitions and Revit Drawing Conventions
- BIM2 – Revit Basics including Floor, Walls, Roofs, Structure, Views and Sheets
- BIM3 – Advanced modeling including materials, rendering, Families, Components and Annotation
- Physical Modeling – Team Site Model and Modeling Techniques
- **PROJECT GOALS: Advanced Digital Technologies to Aid Form Making**

Freehand Drawing Assignments (10%)
#1 – Architectural Transformation
- Pick an object. Using the “Conceptual Transformation” technique, draw it several times (at least 4) to bring out its fundamental qualities
- Use the “Bull Transformation” as a benchmark.
- Use pencil or pen. Drawings on 8.5”x11” paper
#2 & #3 - Architectural Renderings
- Choose an Evanston Home in the area and draw its entry elevation.
- Pay particular attention the entry door and windows. Document these features in a detailed hand drawing with pencil.
- Indicate light, shadow, materials and texture. Drawings on 8.5” x 11” paper.
- **PROJECT GOALS: Seeing and Communicating Materiality and Detail**

Structural Engineering Assignment (10%)
- Two assignments focusing on the development of each student’s structural system
- Students interact with Engineering Professor, David Corr
- Complete engineering analysis and calculations
- **PROJECT GOALS: Quantitative analysis and Integrating Design + Engineering**

Reports and Readings (5%)
Visitor Lecture Synopsis
- After each lecture, summarize the material through writing, building, collaging or diagraming in a creative way. Focus on the main themes.
- Not more than one page.

Book Discussion / Readings
- Conceptual Blockbusting by James Adams - Read the book and be prepared to discuss it in a group format.
- Read individual book from selected reading list and write a one page review.
- **PROJECT GOALS: Listening, Understanding and Communicating**
<table>
<thead>
<tr>
<th>Fall 2017</th>
<th>Winter 2018</th>
<th>Spring 2018</th>
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</thead>
<tbody>
<tr>
<td>• Conceptual Blockbusting - James Adams</td>
<td>• TBD</td>
<td>• TBD</td>
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</tbody>
</table>

### Required Readings
*Read and Discuss in Class*

### Selected Readings
*(Read One/Quarter; Write One-Page Review)*

#### Architecture / Planning General Concepts
- The Plan of Chicago - Carl Smith
- Toward an Architecture - Le Corbusier
- Complexity and Contradiction - Venturi
- Ideas that Shaped Buildings - Hearn
- The Architecture of Humanism - Scott
- Notes on the Synthesis of Form - Alexander
- Chicago Skyscrapers 1871-1934 - Thomas Leslie
- The Shingle Style and the Stick Style - Vincent Scully
- The Plan of Chicago - D.H. Burnham
- The Architecture of John Wellborn Root - Donald Hoffman
- Frederick Law Olmsted and the American Environmental Tradition - Albert Fein
- Inventing America - Jefferson's Declaration of Independence - Gary Wills
- Late Entries to the Chicago Tribune Tower Competition - Tigerman
- John Wellborn Root, Architect - Harriet Monroe
- The Chicago School of Architecture - Mark L. Peisch
- The Chicago School of Architecture - Carl Condit
- The Prairie School - H. Allen Brooks
- Frank Lloyd Wright to 1910 - Grant C. Manson
- The Mathematics of the Ideal Villa and Other Essays - Colin Rowe
- David Adler - Richard Pratt
- Mies van der Rohe - Phillip Johnson

#### Creative Thinking
- A Whole New Mind - Daniel Pink
- Lateral Thinking - Edward De Bono
- How to Have a Beautiful Mind - Edward De Bono
- The Laws of Simplicity - John Maeda
- The Art of Innovation - Tom Kelley
- The Elements of Style - Strunk & White
- Thinkertoys - Michael Michalko
- The Design of Everyday Things - Donald Norman
- Change By Design - Tim Brown
University Athletic Facilities District Analysis
The U2 District is appropriate and consistent with existing university uses. Hotel and retail uses are not listed as permitted or special uses.

T1: Transitional Campus District
The purpose of the T1 district is to serve as a buffer between intensive university activities and low-density residential uses. There is one T1 district in the Study Area located west of Ryan Field.

Permitted Uses: Adult or Child Day Care, Single-Family Dwelling, Two-family Dwelling, Educational Institution, Home Occupation, Park, Playground, and Residential Care Home.

Special Uses: Administrative and Departmental Staff Offices, Bed & Breakfasts, Educational Institutions, Faculty Offices, Parking Areas with more than 5 spaces, Parking Lot, Category II Residential Care Home, Student Religious Organizational Meeting House, Category I & II Transitional Treatment Facilities, and Planned Developments.

Minimum Lot Size:
- **Single-Family**: 5,000 square feet with a 35-foot minimum width.
- **Two-Family**: 2,500 square feet per dwelling unit with a 35-foot minimum width.
- **Nonresidential**: 7,200 square feet with a 35-foot minimum width.

Maximum Lot Coverage: 40%.

Maximum Height: 35 feet or 2½ stories, whichever is less.
Setbacks:
- **Front:** 27 feet.
- **Corner Side Yard:** 15 feet.
- **Side Yard:** 10 feet for single-family homes; 15 feet for two-family dwellings; 5 feet for non-residential buildings.
- **Rear Yard:** 30 feet for single-family and two-family homes; 3 feet for non-residential buildings.

Parking:
- 2 spaces for single-family homes.
- 1.5 per single-family attached and two-family dwelling units.
- 1.25 to 2 spaces for each multi-family dwelling unit dependent upon number of bedrooms.

**Transitional Campus District Analysis**
The T1 District accommodates the large parking lots serving Northwestern University and Evanston Hospital (ENH) and nearby shops and residents. Parking structures with retail space components do not appear to be allowed as permitted or special uses.

**OS: Open Space District**
The purpose of the OS district is to maintain large open space and recreational areas. There are five OS districts within the Study Area, including four parks and the Peter Jans Golf Course.

**Permitted Uses:** Arboreta, Botanical Gardens, Community Centers, Conservatories, Cultural Facilities, Educational Facilities, Forest Preserves, Golf Course, Park, Playground and Recreation Center.

**Special Uses:** Cemetery and Zoological Garden.

**Minimum Lot Size:** 20,000 square feet and 25-foot minimum width.

**Floor-Area Ratio:** 0.15
Eleven progressive states of same Lithograph, c. 11⅛ x 16⅞" (28.9 x 42.1 cm)
Meurle 17, States I-XI. Collection Bernard Picasso, Paris

I. December 5, 1945

II. December 12, 1945

III. December 18, 1945

IV. December 22, 1945

V. December 24, 1945

VI. December 26, 1945

VII. December 28, 1945

VIII. January 2, 1946

IX. January 5, 1946

X. January 10, 1946

XI. January 17, 1946

Bull. Paris, December 26–25, 1945
Watercolor, gouache, and India ink on cardboard,
3⅝ x 11⅛" (13.3 x 29.1 cm)
Zervos XIV, 130. Musée Picasso, Paris

Conceptual Drawing Transformations
MASTER SUITE

BEDROOM
PRIVATE, COMFORTABLE AND COZY
SHOULD HAVE GREAT VIEWS OUT TO LANDSCAPE
ACCESS TO AN EXTERIOR PORCH
KING SIZE BED

BATHROOM
BATHROOM WITH TUB AND SHOWER (NOT ENTIRELY GLASS)
HEATED FLOORS IN BATHROOM
MAKEUP AREA

CLOSETS
LARGE HIS AND HERS CLOSETS
HIDDEN SAFE

SITTING ROOM / OFFICE
TV / SITTING AREA
FIREPLACE
SMALL FRIDGE / COFFEE AREA
SMALL OFFICE AREA

LAUNDRY
SMALL LAUNDRY AREA OFF THE MASTER CLOSETS
WASHER / DRYER (STACKED?)
SHELVING

CASITA SUITE

SIMILAR TO MASTER SUITE EXCEPT SMALLER
NO TUB IN BATHROOM
ONE WALK IN CLOSET
SEPERATE HVAC ZONE
GROUND FLOOR NECESSARY FOR FUTURE WHEELCHAIR CONVERSION
OFFICE / SITTING AREA SHOULD HAVE MURPHY BED
POTENTIAL FOR EXTERIOR ACCESS
KITCHENETTE COMBINED WITH SITTING RM?