Semester: FALL 2019  Units: 4
University of Southern California
School of Architecture
Prerequisite: NONE

ARCH 205aL: ARCHITECTURE FOR ENGINEERS
The process and communication of building design:
Physical building shells, systems for structure, enclosure, and space ordering.

Instructor/Coordinator: Adjunct Assoc. Professor Mina M. Chow, AIA, NCARB
MON/WED 1:00pm-3:50pm  Location: WATTB12
Office Hours: M W by appointment.  Email: minachow@usc.edu

This is a foundation studio course in an interdisciplinary program with the School of Engineering that first was established in the 1970's. The three-year interdisciplinary program is based in the School of Civil and Environmental Engineering Studies. This program will familiarize the student with architecture, landscape architecture, planning, structural, mechanical, and electrical engineering and the related issues that contribute to the built environment for our society. It introduces the process of coordinating all of these aspects for the engineering student.

This course will help the student comprehend the nature of order in our surroundings, and to create an appreciation and understanding of how and why these systems are established. Projects will focus on the intrinsic properties of materials applied in structural and conceptual expression. The primary objective is to expose students to current issues related to design in architecture, and to teach the intrinsic nature of architecture developed through principles based on the design and construction process.

This first course will explore basic principles of 2 and 3 dimensional compositions though a series of design exercises, discussions, and critiques; focusing on the intrinsic properties of materials applied in structural and conceptual expression. Emphasis is placed on design as a creative, conceptually driven, iterative process. Attention is given to theories of context, unity, order, proportion, shape, balance, form, and space as they apply to abstract composition and structural design. Expression of ideas and values present in physical form are explored through observation, analysis, transformation, and synthesis. Students develop and document projects using a variety of means, including model making, REVIT or OTHER software programs, sketching, mechanical drawing, and photography. Project craft and execution are emphasized. In summary, the lectures, discussions and design problems will begin to reveal how architects and design professionals think, and what they must think about when designing a building or a space.

Sustainability:
In addition, the studio will address the important role architects and engineers direct in the sustainability of our environment. We will discuss the 2030 Challenge in how design should engage the environment in a way that dramatically reduces or eliminates the need for fossil fuel and find applications to the design of our structures.

Diversity & Inclusion:
The class supports the discussion of diverse ideas and intend to make the classroom a safe environment to talk about diverse approaches to building better communities. The classroom follows the USC Principles of Community. http://studentaffairs.usc.edu/ssa/usc-principles-of-community/
For more resources:
SCampus Part D, Section 1: Free Expression and Dissent
https://policy.usc.edu/scampus-part-d/
USC diversity website
COURSE OBJECTIVES:

A) Apply two and three-dimensional formal design principles and theories to simple design problems, investigating the intrinsic properties of materials applied in structural and conceptual expression.

B) Develop alternative solutions to a given design problem through the use of iterative design process.

C) Employ fundamental theories of visual perception to create spatial unity, dialog, contrast, balance, tension, rhythm, and harmony in design projects.

D) Use research, critical thinking, and analytical skills to find and reveal the cultural values embedded in a physical object created by a society.

E) Through abstraction, create design projects that reveal the essential meanings of their subjects.

F) Employ knowledge of ordering principals such as proportional systems, scale, solid/void, figure/ground, balance and symmetry, balance and asymmetry to organize a design solution that clearly reflects a design concept.

G) Demonstrate mastery of basic presentation craft and organization though verbal, graphic, and model building means.

H) Communicate a comprehensive design concept using verbal, graphic and model making skills.

COURSE CONTENT:

Analysis:

1. Research: Students will perform research at libraries and/or using scholarly online portals, and by visiting significant works of architecture.

2. Observation: The relationship of the whole environment to its parts, especially as related to the structure of building elements.

3. Formal Analysis: Introduction to two and three-dimensional analytical techniques.

4. Contextual Analysis: Study of factors effecting the perception and meaning of environments.

5. Problem Analysis: Investigating constraints and opportunities presented by a variety of design problems.

6. Application: Synthesis of the above critical process into coherent design solutions that creatively address issues revealed through analysis.

7. Design principles:
1. **Primary Elements of Form**: What they are and how they relate to the design of structures.

2. **Form Generation**: How forms are generated and used in the design process.

3. **Context and meaning**: The interrelationships between an object, its environment, and meaning.

4. **Scale**: How size and proportion affect meaning.

**Organizational principles:**

1. **Proportion**: Ancient and modern systems used to organize works of architecture and art. How proportional systems are used to organize designs.

2. **Balance and Symmetry**: How balance and symmetry affect meaning and perception of form.

3. **Balance and Asymmetry**: How balance is achieved between design elements in asymmetrical relationships.

4. **Figure/Ground**: How figure and ground interact to create and define spatial relationships.

5. **Solid/Void**: Solid and void interrelationships and their effect on meaning and experience.

**Design realization:**

1. **Synthesis**: Integration and resolution of disparate and conflicting design issues into clear, well-organized, aesthetically and structurally sound solutions.

**COURSE OBJECTIVES WILL BE ACHIEVED THROUGH THE FOLLOWING:**

1. Design studio assignments.
2. Discussions, active-learning presentations.
3. Project critiques and reviews
4. Fieldtrip(s)
5. Final project.

**ASSIGNMENTS/GRADING:**

60% (5) Design Studio Assignments
25% (1) Final Project
15% Attendance and Participation for studio lectures, discussions and fieldtrip

**REQUIRED DRAWING EQUIPMENT:**
BLICK Art Materials have assembled Student Kits with special pricing for the class. These may be purchased the 1st week of class on campus at the school. Equipment and tools may be handed down from your upper division classmates. Please check all resources.

- **Student Kit 1 w/ drawing board**: $239.99
- **Student Kit 2 w/o drawing board**: $134.99
**Kits contain:**

--Adjustable triangles (30/60, 45 degrees)
--Architectural & Engineering scales (1/16", 1/8", 1/4", 1/2", etc... and 1:10, 1:20, 1:30 etc...)
--Drafting leads and mechanical pencils (H, 2H, 3H, F, B, 2B etc...)
--Drafting lead holder
--Sketch pencils and pens
--Eraser(s)
--Eraser shield(s)
--Trace paper (white or buff color)
--Metal straightedge
--Kit 1 only: Drafting board or parallel rule (42" recommended)

Students will need to purchase Clearprint no. 1000 HP vellum paper or mylar—as needed.

**REFERENCES:**

Readings will be from the following texts.

Required books may checked out from our library. For more information, visit USC Libraries OER Guide [http://libguides.usc.edu/oer](http://libguides.usc.edu/oer)

Some will be **provided in advance** on: [https://blackboard.usc.edu](https://blackboard.usc.edu).

**REQUIRED:**

($36) eText ISBN: 9781118745199, 1118745191

**RECOMMENDED:**


### CLASS SCHEDULE (SUBJECT TO CHANGE- PLEASE STAY INFORMED):

#### Week 1

**MON**

**AUG 26**

**INTRODUCTION & ORIENTATION, REVIEW COURSE HANDOUTS**

**DISCUSSION:** *“WHAT is Architecture?” & “FIGURE GROUND”*

**HANDBOOK:** A1 _Definition of 2 Squares*

**HOMEWORK:**

-- **READ** Ching, Francis. *Form, Space and Order*, Chapter 7, p.349 – 423, as provided on Blackboard.

-- **READ** Lauer, David and Stephen Tentak. *Design Basics*, Chapter 2, 3, 4, 5, 6, as provided on Blackboard.

-- **CREATE** 4-5 test compositions of “Definition of 2 Squares” @ ½ size (9” x 12”) for class review.

**WED**

**AUG 28**

**DISCUSSION/EXERCISE: “DIAGRAMMING” & “CONTOUR LINE COMPOSITION”**

-- **REVIEW** READINGS AND ASSIGNMENT COMPOSITIONS

**HOMWORK:**

-- **READ** Dondis, Donis A. *Primer of Visual Literacy*, as provided on Blackboard.

-- **READ** Gargis, Jacqueline. *Ideas Of Order: A Formal Approach Architecture*-- as provided on Blackboard.

-- **REVISE** 4-5 test compositions of “Definition of 2 Squares” @ ½ size (9” x 12”) for class review.

-- **SKETCH** pure contour drawings (10 total in sketchbook DUE: Wed 09/09/19).

#### Week 2

**MON**

**SEP 2**

**LABOR DAY Holiday — NO CLASS!**

**WED**

**SEP 4**

**REVIEW:** *“A1: Definition of 2 Squares”*

**DISCUSSION:** *“DIAGRAM & ABSTRACTION”*

**HANDBOOK:** A2 _Historic Precedent*

**HOMEWORK:** Research & Diagramming

#### Week 3

**MON**

**SEP 9**

**Sketchbook Assignment #1 DUE**

**CLASS DISCUSSION/ REVIEW:** *“RESEARCH”*

3:00pm WOODSHOP ORIENTATION with Chris Beas

**HOMEWORK:** Research & Diagramming

**WED**

**SEP 11**

**REVIEW:** *“A2: Historic Precedent” DIAGRAMS DUE*

**DISCUSSION:** *“PAPER TOWER “*

**HANDBOOK:** A3 _Paper Tower*

**HOMEWORK:** A3 _Paper Tower Research and Study models

*Create (6) paper studies* manipulating 8½ x 11” paper.

Start development of Protocol Unit(s)

#### Week 4

**MON**

**SEP 16**

**REVIEW** Paper Tower Research and Study Models

**DISCUSSION:** *“DRAWINGS: ORTHOGRAPHIC PROJECTIONS”*

**HOMEWORK:** Continue development of Protocol Unit(s)
WED  
SEP 18  
**Fieldtrip:** The Broad Museum (Los Angeles, CA)  
**Meet at 2:30pm at:** 221 S. Grand Avenue, Los Angeles, CA 90012

**Week 5**

**MON**  
SEP 23  
**DESK CRITS:** A3: Paper Tower Protocol Units  
**WORKSHOP:** Plans, Elevations, Sections  
**HOMEWORK:** Continue development of Protocol Unit(s)  
DRAW initial plan, section, elevation studies.

**WED**  
SEP 25  
**REVIEW Paper Tower Research and Study Models**  
**HOMEWORK:** Start Final Model  
(5:30pm Film screening at USC Sol School for Public Policy.)

**Week 6**

**MON**  
SEP 30  
**DESK CRITS:** A3: Paper Tower  
**HOMEWORK:** Start Final Drawings

**WED**  
OCT 2  
**DESK WORK:** A3: Paper Tower/Adnan Solanki ADOBE TUTORIAL  
**HOMEWORK:** Complete Final Model  
(Mina in Winston-Salem. Film screening.)

**Week 7**

**MON**  
OCT 7  
**REVIEW:** “A2: Paper Tower” DUE  
**HANDOUT:** A4: Cardboard Shelter or Chair  
**HOMEWORK:** “Cardboard Shelter or Chair” Research  
--WRITE Research Report.

**RESEARCH REPORT REQUIREMENTS:**

1. Select/Research (3) Furniture precedent based on strong concept and a relationship to its construction material(s).
2. Describe why you selected each precedent, what are the concept(s) behind it, what are the relationships to the human body and how they manifest in the form, connections and details.
3. 8 ½ x 11” format, Arrange each page in 2 columns. One(1) column for visual images, one (1) column for descriptive text.

**WED**  
OCT 9  
**GROUP/DESK CRITS:** A4: Temporary Cardboard Shelter/Cardboard Chair  
**REVIEW READING/LECTURE:** “Presentation Drawings”  
**HOMEWORK:** “Cardboard Shelter or Chair” Study models  
(Mina in Sacramento. Film screening.)

**Week 8**

**MON**  
OCT 14  
**GROUP/DESK CRITS:** A4: Temporary Cardboard Shelter/Cardboard Chair  
**HOMEWORK:** “Cardboard Shelter or Chair” Study models

**WED**  
OCT 16  
**Fieldtrip:** Buro Happold (Los Angeles, CA)  
**Meet at 2:45pm at:** Buro Happold  
800 Wilshire Blvd  
Los Angeles, CA 90017

**Week 9**

**MON**  
**GROUP/DESK CRITS:** A4: Temporary Cardboard Shelter/Cardboard Chair
**OCT 21**  **HOMEWORK:** “Cardboard Shelter or Chair” Study models/ Layout drawings

**WED OCT 23**  **DRAWINGS A4:** Temporary Cardboard Shelter/Cardboard Chair  
**HOMEWORK:** Final Drawings/ Start Construction

**Week 10**  
**MON OCT 22**  **FINAL DETAILS A4:** A4: Temporary Cardboard Shelter or Cardboard Chair  
**HOMEWORK:** Final Drawings/ Complete Construction

**WED OCT 28**  **REVIEW:** A4: Temporary Cardboard Shelter or Cardboard Chair  
**DUE HANDOUT:** A5: Historic Precedents

**Week 11**  
**MON OCT 30**  Historic Precedents #5

**WED NOV 4** Historic Precedents #5

**Week 12**  
**MON NOV 6** Historic Precedents #5

**WED NOV 7** Historic Precedents #5

**Week 13**  
**MON NOV 11**  **REVIEW:** “Historic Precedents #5” DUE  
**HANDOUT:** “A6: Phenomenal Garden” (Capture a phenomenon with structure)  
**DISCUSSION:** “PHENOMENA VS. MATERIAL”  
**HOMEWORK:** Meet w/ your teams. 1. RESEARCH phenomena and precedents. 2. SKETCH ideas.

**WED NOV 13**  **REMOTE WORK:** Discussion and meet with your teams.  
**HOMEWORK:** 1. MAKE study models and sketches.

**Week 14**  
**MON NOV 18**  Phenomenal Garden RESEARCH DUE.  
Discussion and meet in your teams.  
**HOMEWORK:** 1. Study models and sketches.

**WED NOV 20**  Phenomenal Garden STUDIES: ¼” sketches and ½” model of Construct DUE. Meet with your teams.  
**HOMEWORK:** 1. Study models and sketches.  **Explore 4 connection details.**

**Week 15**  
**MON NOV 25**  Phenomenal Garden STUDIES: Revise Design of Construct.  
Discussion and meet with your teams.  
**HOMEWORK:** Continue development of 4 connection details.  
Start Construction.
NOV 27 - DEC 1
THANKSGIVING RECESS

Meet with your teams.

Week 16
MON DEC 2
STUDY WEEK: Phenomenal Garden
Continue Construction.
Discussion and meet in your teams.

WED DEC 4
STUDY WEEK: Phenomenal Garden
Continue Construction.
Discussion and meet in your teams.

DEC 6
LAST DAY OF CLASSES

STUDY WEEK DEC 7-10
MON DEC 9
STUDY WEEK: Phenomenal Garden
Continue Construction.
Discussion and meet in your teams.

FRI DEC 13
FINAL REVIEW: “Phenomenal Garden”
Watt Lawn
Lower Level Hollow.
2:00-4:00pm

MON DEC 16
PORTFOLIO DUE @ 5:00PM