

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 through 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

Mina Chow, AIA, NCARB Adjunct Associate Professor

<https://diversity.usc.edu/resources-for-students/>
DSP and Universal Design for Learning (UDL):
<http://www.udlcenter.org/aboutudl/whatisudl>

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 through 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

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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 be checked out from our library. For more information, visit USC Libraries OER Guide <http://libguides.usc.edu/oer>

Some will be **provided in advance** on: <https://blackboard.usc.edu>.

REQUIRED:

Architecture: Form Space and Order 4th ed. Ching, Francis, D.K. (2014) John Wiley & Sons;
(\$55) □ Print ISBN: 9781118745083, 1118745086
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118745086.html>
(\$36) □ eText ISBN: 9781118745199, 1118745191
<https://www.wiley.com/en-us/search?pg=1118745191%7Crelevance>

RECOMMENDED:

Structure and Design 1st edition Schierle, Goetz. G. (June 2008) Cognella, Inc.;
(\$59-\$72) □ Print ISBN: ISBN-13: 978-1934269374 ISBN-10: 1934269379
http://www.amazon.com/gp/offerlisting/1934269379/ref=sr_1_1_olp?s=books&ie=UTF8&qid=1471475409&sr=1-1&keywords=structure+and+design

Understanding Architecture, 2nd Ed., Steen Eiler Rasmussen, The MIT Press; (1964) ISBN-10: 0262680025.

Art and Visual Perception A psychology of the creative Eye. The New Version 2nd edition, Arnheim, Rudolph, (July 1983) Univ. California Press; ISBN: 0520026136

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

Week 1 MON AUG 26	INTRODUCTION & ORIENTATION, REVIEW COURSE HANDOUTS DISCUSSION: “ <i>WHAT is Architecture?</i> ” & “ <i>FIGURE GROUND</i> ” HANDOUT: A1_Definition of 2 Squares HOMEWORK: -- READ Ching, Francis. <i>Form, Space and Order</i> , Chapter 7, p.349 – 423, as provided on Blackboard. -- READ Lauer, David and Stephen Tentak. <i>Design Basics</i> , 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: “ <i>DIAGRAMMING</i> ” & “ <i>CONTOUR LINE COMPOSITION</i> ” --REVIEW READINGS AND ASSIGNMENT COMPOSITIONS HOMEWORK: -- READ Dondis, Donis A. <i>Primer of Visual Literacy</i> , as provided on Blackboard. -- READ Gargis, Jacqueline. <i>Ideas Of Order: A Formal Approach Architecture</i> -- 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: “ <i>DIAGRAM & ABSTRACTION</i> ” HANDOUT: 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: “ <i>PAPER TOWER</i> ” HANDOUT: A3_Paper Tower HOMEWORK: A3: Paper Tower Research and Study models Create (6) paper studies manipulating 8 ½ x 11” paper. Start development of Protocol Unit(s)
Week 4 MON SEP 16	REVIEW Paper Tower Research and Study Models DISCUSSION: “ <i>DRAWINGS: ORTHOGRAPHIC PROJECTIONS</i> ” 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
OCT 3

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
--**READ** Rasmussen, Steen Elier, *Experiencing Architecture*, Chapter V, pp. 104-126
--**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
OCT 11

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 **DRAWINGS A4: Temporary Cardboard Shelter/Cardboard Chair**

OCT 23 **HOMEWORK:** Final Drawings/ Start Construction

Week 10

MON

FINAL DETAILS A4: A4: Temporary Cardboard Shelter or Cardboard Chair

OCT 22

HOMEWORK: Final Drawings/ Complete Construction

WED

REVIEW: A4: Temporary Cardboard Shelter or Cardboard Chair DUE

OCT 28

HANDOUT: A5: Historic Precedents

Week11

MON

Historic Precedents #5

OCT 30

WED

Historic Precedents #5

NOV 4

Week 12

MON

Historic Precedents #5

NOV 6

WED

Historic Precedents #5

NOV 7

Week 13

MON

REVIEW: “Historic Precedents #5” DUE

NOV 11

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

REMOTE WORK: Discussion and meet with your teams.

NOV 13

HOMEWORK: 1. **MAKE study models and sketches.**

Week 14

MON

Phenomenal Garden RESEARCH DUE.

NOV 18

Discussion and meet in your teams.

HOMEWORK: 1. Study models and sketches.

WED

Phenomenal Garden STUDIES: ¼” sketches and ½” model
of Construct DUE. Meet with your teams.

NOV 20

HOMEWORK: 1. Study models and sketches. **Explore 4 connection details.**

Week 15

MON

Phenomenal Garden STUDIES: Revise Design of Construct.

NOV 25

Discussion and meet with your teams.

HOMEWORK: Continue development of 4 connection details.
Start Construction.

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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