Semester: FALL 2023 Units: 4
University of Southern California
School of Architecture
Prerequisite: NONE

ARCH 205aL: ARCHITECTURE FOR ENGINEERS
Process and communication of building design:
Physical building shells, systems for structure, enclosure, human spatial ordering.

Instructor/Coordinator: Adjunct Professor Mina M. Chow, FAIA, NCARB
Schedule: MON/WED 1:00pm-3:50pm Location: Watt 200, Blackboard
Office Hours: M W by appointment. Please note communications will be addressed in a timely manner. I do not write student recommendations. Please respect time zones for all communication. 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 familiarizes students with architectural and structural design, urbanism and landscapes, mechanical and electrical engineering and the related issues that contribute to the built environment for society. It introduces the process of coordinating all 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 introduces fundamental design concepts, current issues of influence, and value systems to elevate design and critical thinking skills of undergraduate engineering students. Students 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. Students will be challenged to contend with actual dynamic forces, haptic and contextual dimensions on life-size physical and material structures on real-world sites. 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, RHINO, ADOBE Photoshop/Illustrator/InDesign and/or OTHER software programs, sketching, drawing, and photography. Project craft and execution (IRL or digitally) 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.

COURSE OBJECTIVES:

A) Apply two and three-dimensional formal design principles and theories to simple design exercises.
B) Investigate intrinsic properties of materials applied in structural and conceptual expression to create original (IRL) design projects.

C) Develop alternative solutions to a given or self-defined design problem through an iterative design process.

D) Employ fundamental theories of visual perception for spatial unity, dialog, contrast, balance, tension, rhythm, and harmony in creative documentation and representation of design projects.

E) Use research, critical thinking, and analytical skills to discover the cultural values embedded in physical objects and spaces created by a society.

F) Through abstraction and transformation, create designs that express or reveal identity and meaning of their subject(s) and/or context(s).

G) Employ ordering principals and systems (i.e.-- proportion, scale, solid/void, figure/ground, balance and symmetry, balance and asymmetry) to organize a design solution that clearly reflects a design concept.

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

I) Communicate clearly using verbal, graphic and physical model-making skills, an intentional and comprehensive design concept.

COURSE CONTENT:

Analysis:

1. **Research:** Students will perform research IRL at libraries and/or use trusted online scholarly portals, and/or investigate primary sources.

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.

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.

2. **Representation**: Ability to employ appropriate representational media, including computer technology, to convey essential formal elements at each stage for the programming and design process.

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

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

**ASSIGNMENTS/GRADING:** *Attending classes is mandatory* to earn minimum 10% of your grade. Late arrivals, disappearances or early departures may be considered part of absences.

- **60%** (5) Design Studio Assignments [2 individual + 2 group]
- **25%** (1) Final Project
- **15%** Attendance and participation for studio talks and discussions.

**RECOMMENDED DRAWING EQUIPMENT:**

You may also find other deals or use other comparable equipment. Graphic software will be used (ie. —RHINO, Adobe, Revit, etc…). **Clarity and substance are emphasized** in evaluations.

**Blick Art Supplies ORDER CONTACT: Blickbeverly@dickblick.com**
Adam Crouse, Western District Sales and Outreach Manager
7301 West Beverly Blvd. Los Angeles, CA 90036
Mobile: 480-510-4806 W: 480-446-0800 A.Crouse@dickblick.com  |  www.dickblick.com

- 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, pens
- Erasers & shields
- Trace paper (white or buff color)
- Metal straightedge

Students may share the purchase 1-2 rolls of plotting paper (glossy and draft plotting paper) —as needed for individual or group project prints.

(i.e.— [https://www.wabpapersupply.com/P/168/24ColorBond36x1502corePlotterPaper](https://www.wabpapersupply.com/P/168/24ColorBond36x1502corePlotterPaper))

(i.e.— [https://www.wabpapersupply.com/C/25/StandardBondRolls-Inkjet](https://www.wabpapersupply.com/C/25/StandardBondRolls-Inkjet))
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: (Available at USC libraries)
eText ISBN: 9781118745199, 1118745191
https://www.wiley.com/en-us/search?q=1118745191%7Crelevance

RECOMMENDED:
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

Art and Visual Perception A psychology of the creative Eye. The New Version 2nd edition,

ACADEMIC INTEGRITY:
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by principles in the Student Handbook. Students will be referred to the Office of Academic Integrity (OAI) and the Office of Community Expectations (OCE) OAI oversees academic integrity matters, including addressing academic misconduct, promoting ethical practices, and upholding the university's standards of academic honesty. At the same time, OCE addresses non-academic violations of the Student Handbook.

Membership in the academic community places a special obligation on all members to preserve an atmosphere conducive to the freedom to teach and to learn. Part of that obligation implies the responsibility of each member of the USC community to maintain a positive learning environment in which the behavior of any individual does not disrupt the classes of teachers or learners. It is the responsibility of the individual faculty member to determine, maintain and enforce the standards of behavior acceptable to preserving an atmosphere appropriate for teaching and learning. Students will be warned if their behavior is evaluated by the faculty member as disruptive. Sanctions may include a range of responses from immediate removal from class to referral to the appropriate academic unit to review pertinent alleged university violations of ethical and behavioral standards. Significant and/or continued violations may result in administrative withdrawal from the class.
ECOLOGICAL RESPONSIBILITY:
In addition, the course will address the important role architects and engineers direct in the sustainable and ecological responsibility of our environment. We will discuss 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, EQUITY & 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: https://diversity.usc.edu/usc-principles-of-community/ And the School of Architecture Mission & Vision: https://arch.usc.edu/diversity-equity-inclusion

For more resources:
SCampus Part D, Section 1: Free Expression and Dissent
https://policy.usc.edu/scampus-part-d/
USC Campus and Student Affairs
https://diversity.usc.edu/campus-and-student-affairs-resources/
DSP and Universal Design for Learning (UDL): https://dsp.usc.edu/
http://www.udlcenter.org/aboutudl/whatisudl

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

**Week 1**
**MON**
AUG 21
**INTRODUCTION & ORIENTATION**, REVIEW COURSE HANDOUTS
**DISCUSSION**: “WHAT is Architecture?” & “FIGURE GROUND”
**HANDOUT**: A1_Definition of 2 Squares
**HOMEWORK**:  
--READ Ching, Francis. *Form, Space and Order*, Chapter 7, p.349 – 423, provided on Blackboard.  
--READ Lauer, David and Stephen Tentak. *Design Basics*, Chapter 2, 3, 4, 5, 6, provided on Blackboard.  
--CREATE 4-5 test compositions of “Definition of 2 Squares” @ ½ size (9” x 12”) for class review.

**WED**
AUG 23
**DISCUSSION/EXERCISE**: “CONTOUR LINE COMPOSITION”
**REVIEW READINGS AND ASSIGNMENT COMPOSITIONS**
**HOMEWORK**:  
--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 “Def. of 2 Squares” @ ½ size (9” x 12”) for class review.  
--SKETCH pure contour drawings (10 total in sketchbook DUE: Wed 08/30/23).

**Week 2**
**MON**
AUG 28
**REVIEW**: “A1: Definition of 2 Squares”
**DISCUSSION**: “DIAGRAM & ABSTRACTION”
**HANDOUT**: A2: Historic Precedent
**HOMEWORK**: Research & Diagramming
WED AUG 30  
**Sketchbook Assignment #1 DUE**

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

**HOMEWORK:** Research & Diagramming

**Week 3**

**MON**  
**SEP 4**  
**LABOR DAY Holiday — NO CLASS!**

**WED**  
**SEP 6**  
**REVIEW: “A2: Historic Precedent” DIAGRAMS DUE**

**CLASS DISCUSSION:** “*PAPER TOWER*”

**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 11**  
**GROUP CRIT:** A3: Paper Tower Research and Study Models

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

**HOMEWORK:** Continue development of Protocol Unit(s)

**WED**  
**SEP 13**  
**GROUP CRIT:** A3: Paper Tower Protocol Units

**WORKSHOP:** Rhino, Plans, Elevations, Sections

**HOMEWORK:** Continue development of Protocol Unit(s)

DRAW plan, section, elevation studies.

**Week 5**

**MON**  
**SEP 18**  
**Fieldtrip:** LACMA Exhibitions

Meet 1:30pm at: 5905 Wilshire Blvd, Los Angeles, CA 90036

**WED**  
**SEP 20**  
**INDIV CRITS:** A3: Paper Tower Protocol Units/ Professional Ethics

**HOMEWORK:** Continue development of Protocol Unit(s)

CONT plan, section, elevation studies.

START Final Model after consultation.

**Week 6**

**MON**  
**SEP 25**  
**INDIV CRITS:** A3: Paper Tower

**HOMEWORK:** Continue development of Protocol Unit(s)

CONT plan, section, elevation studies.

START Final Model after consultation.

**WED**  
**SEP 27**  
**INDIV CRITS:** A3: Paper Tower

**HOMEWORK:** START Final Drawings

**Week 7**

**MON**  
**OCT 2**  
**MIDTERM REVIEW:** “A3: Paper Tower” DUE (Lindhurst Gallery)

**HANDOUT:** A4: Human Shelter Team Project

**HOMEWORK:** “Precedent” Research


--RESEARCH & WRITE a Report. **REQUIREMENTS:**

1. *Select/Research (3) “shelter” precedents based on strong concept and a relationship to its construction material(s).*
2. Describe why you selected each precedent, the concepts behind it, the relationships to the human body and how they manifest in the design, connections and details.

3. 8 ½ x 11” format, for example, Arrange each page in 2 columns. One (1) column for visual images, one (1) column for descriptive text.

Wed Oct 4  
**DISCUSSION:** **A4**: Human “Shelter” Team Project  
**HOMEWORK:** “Human Shelter” Study models

**Week 8**  
**Mon Oct 9**  
**PEER/INDIV CRITS:** **A4**: Human “Shelter” Team Project  
**HOMEWORK:** “Human Shelter” Study models/ Layout drawings

**Wed Oct 11**  
**Fieldtrip:** **LACMA Construction Site Visit**  
Meet 1:30pm at: 5905 Wilshire Blvd, Los Angeles, CA 90036

**Week 9**  
**Mon Oct 16**  
**DRAWINGS A4:** Human “Shelter” Team Project  
**HOMEWORK:** Start Construction & Final drawings

**Wed Oct 18**  
**CONTINUE DESIGN DETAILS A4:** Human “Shelter” Team Project  
**HOMEWORK:** Start Construction & Final drawings

**Week 10**  
**Mon Oct 23**  
**FINAL DETAILS A4:** Human “Shelter” Team Project  
**HOMEWORK:** Continue Construction & Final drawings

**Wed Oct 25**  
**REVIEW:** **A4**: Human “Shelter” Team Project DUE (Watt 212)  
**HANDOUT:** **A5**: Historic Precedents

**Week 11**  
**Mon Oct 30**  
**Historic Precedents #5**

**Wed Nov 1**  
**Historic Precedents #5**

**Week 12**  
**Mon Nov 6**  
**Historic Precedents #5**

**Wed Nov 8**  
**REVIEW:** **A5**: Historic Precedents DUE (Watt 200)  
**HANDOUT:** “A6: Phenomenological Space” (Capture a phenomenon.)  
**DISCUSSION:** “PHENOMENA VS. MATERIAL”  
**HOMEWORK:** 1. RESEARCH phenomena/precedents. 2. SKETCH ideas.

**Week 13**  
**Mon Nov 13**  
**Phenomenological Garden RESEARCH DUE**  
**HOMEWORK:** 1. *Select and make site model.*  2. Study models and sketches.
<table>
<thead>
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<th>Date</th>
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| WED NOV 15| **Phenomenological Space STUDIES:** ¼" sketches and ½" models  
**HOMEWORK:** 1. Study models and sketches |
| Week 14   | **Phenomenological Space STUDIES:** ¼" sketches and ½" models  
**HOMEWORK:** 1. Study models and sketches. *Explore 4 connection details.* |
| WED NOV 23| **THANKSGIVING**                                                                      |
| Week 15   | **Phenomenological Space STUDIES:** ¼" sketches and ½" models  
**HOMEWORK:** Continue development of 4 connection details. |
| WED NOV 29| **Phenomenological Space**  
**HOMEWORK:** Individual Consultations & Peer Evaluations  
Start final 3D final construction. |
| DEC 1     | **LAST DAY OF CLASSES**                                                               |
| Week 16   | **STUDY WEEK: Phenomenological Space**  
Individual Consultations & Peer Evaluations |
| WED DEC 6 | **STUDY WEEK: Phenomenological Space**  
Individual Consultations & Peer Evaluations |
| Week 17   | **Phenomenological Space**  
**HOMEWORK:** Individual Consultations & Peer Evaluations  
Finish 3D final construction. |
| WED DEC 13| **FINAL REVIEW: “Phenomenological Space”**  
11:00 am - 1:00 pm |
| THURS DEC 14| **PORTFOLIO DUE @ 5:00PM**                                                          |
| DEC 14 - JAN 7| **WINTER RECESS**                                                                     |