

USC School of Architecture

University of Southern California
School of Architecture
Semester SPR 2017

Prerequisite: CE-205aL

ARCH 205bL: ARCHITECTURE FOR ENGINEERS

The Process and Communication of Building Design:
Physical Building systems for structure, enclosure, space,
ordering and planning.

Instructor/Coordinator: Mina M. Chow, AIA, NCARB
MON/WED 2:00pm-4:50pm
Office Hours: M W ***by appointment***

This is the second semester for a foundation studio course in an interdisciplinary program with the School of Engineering that first was established in the 1970's. This 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 continue to develop the student's comprehension on the nature of contextual and organizational principles that order our surroundings, and to create an appreciation and understanding of how and why these systems are established. The objective is to expose the student to current issues related to design in architecture, and to teach the intrinsic nature of architecture developed through principles based on the design & construction process. These topics are indications of the various value systems that come into play in the contemporary field of architecture. Understanding this and becoming aware that design is a synthetic process that is a balance of many concerns is a major objective of the course.

This course will explore contextual research and analysis introduced in ARCH 205aL in more depth, and architectural program and space planning for a modest, but spatially complex building within an urban context. These projects will continue to emphasize the design process from the initial design concept to the final building proposition. Though precedent studies, design exercises, lectures, and critiques; emphasis is placed on design as a creative, conceptually driven, iterative process; all working within the defined limits of project budgets and schedules.

DESIGN SEQUENCE

The studio will begin with two brief exercises, a precedent study followed by a longer project divided into (2) parts to conclude the semester. The latter will involve the design of a small museum annex and support spaces. The semester's schedule is as follows:

A1_Path, Place & Pavilion: Explore ways in which spaces may be defined to express ideas through site forces and experiential qualities.

A2_Artist's Retreat: Design an artist's retreat with a self-defined program, spatial sequence and narrative.

A3_Precedent Study: The Precedent Study will focus on museums. The study will involve the research, analyze, and critique of a built or proposed museum project. The final product will include accurate plans, sections and models in addition to analytical diagrams and models that decipher the particular aspects of each project.

A4: Museum Annex: Site/Program Analysis & Synthesis: Site analysis will investigate the area where the "Museum Project" is to be located. Students will produce a group site model in

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addition to recording critical information that best describes the site and surrounding area. Program analysis will explore the spatial and organizational qualities of a museum. After compiling a body of research and analysis about the site and program, synthesize on multi-media models to explore several concepts derived from your insights.

A5_Museum Annex: Project Design & Development: This portion of the project will involve the detailed design and development of the museum project. Each proposition will address a variety of topics ranging from urbanism to tectonic and structural issues.

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 addition, the studio will address the important role that architects and engineers play 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.

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 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 the built environment and artifacts created by a society.
- E) Through observation, analysis, synthesis and abstraction, create design projects that reveal the essential meanings of their subjects.
- F) Continue to employ knowledge of ordering principals learned to organize a design solution in planning, spatial experience and detail that clearly reflects a design concept.
- G) Demonstrate mastery and development 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.

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2. **Observation:** The relationship of the whole environment to its parts, especially as related to the structure of building elements.
3. **Formal Analysis:** Continuing development of 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. Lectures, active-learning presentations.
3. Class discussions, critiques and reviews
4. Fieldtrips
5. Final project.

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ASSIGNMENTS/GRADING:

15%	(1) Path, Place & Pavilion
15%	(1) Artist's Retreat
15%	(1) Museum Precedent
40%	(1) Final Project (10%) Research & Site Analysis (20%) Design Presentation
15%	Attendance and Participation for studio lectures, discussions and fieldtrips

REQUIRED DRAWING EQUIPMENT:

Autodesk REVIT software or equivalent 3D modeling program is required.

(NOTE: Autodesk REVIT may be downloaded FREE at: <http://students.autodesk.com>)

REFERENCES:

Readings will be from the following texts or provided in advance from additional texts on:

<https://blackboard.usc.edu>.

Architecture: Form Space and Order 3rd edition Ching, Francis, D.K. 2nd edition (February 1996)
John Wiley & Sons; ISBN: 0471286168

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

RECOMMENDED:

Building Construction Illustrated, Francis D.K. Ching and [Cassandra Adams](#), pub. John Wiley & Sons, 2000.

Manual of Steel Construction, AISC, 2001.

Timber Construction Manual, AITC, 1994.

Timber Construction Manual, Herzog, Natterer, Schweitzer, Volz, Winter, pub. Birkhäuser Basel, 2004.

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

Week 1	INTRODUCTION & COURSE HANDOUTS
MON	LECTURE: “ Path, Place & Pavilion ” (Mina M. Chow)
JAN 9	Handout/Review “ Path, Place & Pavilion ” Assignment Homework: Build 2 site study models (See axonometric diagram.) Collect images about the experience(s) for your design.
WED	“ Path, Place & Pavilion ”
JAN 11	LECTURE: “ Site & Parti ” (Mina M. Chow) DESK CRITS: Sketch design and parti studies. Homework: Begin carving/building designs into study models.
Week 2	
MON	Martin Luther King Holiday – NO CLASS!
JAN 16	
WED	“ Path, Place & Pavilion ”
Jan 18	DESK CRITS: Work on site study models/ Begin plans & sections. CLASS EXERCISE: Missing Line Exercise/ Drawing Line Weights & Depth.

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Homework: Continue development of parti/ Begin dwgs of 1/8" plan & section
Complete Line Weights & Depth Exercise.

Week 3

MON

JAN 23

"Path, Place & Pavilion"

DESK CRITS: Review Parti study models, Lineweights & Depth exercise and final drawing requirements.

Homework: Finalize design parti/ **Refine plans & sections.**

WED

JAN 25

"Path, Place & Pavilion"

DESK CRITS: Refine Concepts & Details.

Homework: Complete Final Model and Drawings

JAN 27

LAST DAY TO REGISTER/ADD/DROP CLASSES

Week 4

MON

JAN 30

"Path, Place & Pavilion" DUE

Handout **"Artist's Retreat"** Assignment

DESK CRITS/CLASS DISCUSSION: **"Retreats"**

Homework: Part I: Build cardboard site model.

Write Part II: Artist Narrative.

WED

FEB 1

Fieldtrip: OFFICE TOUR

Meet at 2:30pm at:

GLUMAC

707 Wilshire Blvd, #2300

Los Angeles, CA 90017

Week 5

MON

FEB 6

"Artist's Retreat"

DESK CRITS/CLASS DISCUSSION: **"Architectural Program"**

Homework: Develop Part II: Artist Narrative.

Diagram Parti(s).

Build 3 smaller study models based on a parti sequence and program

WED

FEB 8

"Artist's Retreat"

DESK CRITS/ CLASS DISCUSSION: **"Spatial Sequence & Narrative"**

Homework: Based on desk crits, continue working on study models developing parti sequence and program.

Week 6

WED

FEB 13

"Artist's Retreat"

DESK CRITS/CLASS DISCUSSION: **"Spatial Volume and Details."**

Refine study models.

Homework: Develop your study model(s). Start drafting plans and sections.

WED

FEB 15

"Artist's Retreat"

CLASS EXERCISE: **Perspective Drawings and Shading.**

Homework: Develop your study model(s). Start Final Model and Dwgs.

Week 7

MON

FEB 20

President's Day — NO CLASS!

WED

"Artist's Retreat"

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FEB 22 DESK CRITS: Continue developing study model(s) and FINAL presentation.
Homework: Continue Final Model and Final Drawings.

Week 8

MON

“Artist’s Retreat”

FEB 27

DESK CRITS: Continue developing study model(s) and FINAL presentation.

WED

“Artist’s Retreat” DUE

MAR 1

Handout **“Precedent Museum”** Assignment

Homework: **“Precedent Museum”** Research

Week 9

MON

FIELD TRIP: Los Angeles County Museum of Art (LACMA)

MAR 6

Meet at 3:00pm at: LACMA
5905 Wilshire Blvd
Los Angeles, CA 90036

WED

“Precedent Museum”

MAR 8

DESK CRITS

Mar 12-19

Spring Recess

Week 10

MON

“Precedent Museum”

MAR 20

DESK CRITS

WED

“Precedent Museum” Final Presentation DUE

MAR 22

(Handout: “Museum Annex”)

HOMEWORK: Team Site Analysis RESEARCH.

Week 11

MON

Fieldtrip: CONSTRUCTION SITE TOUR

MAR 27

Meet at 2:30pm at: TBD
HOMEWORK: Team Site Analysis RESEARCH.

WED

“Museum Annex: Site Analysis”

MAR 29

Meet at 2:00pm at: IN CLASS
Natural History Museum Site
900 Exposition Blvd
Los Angeles, CA 90007

HOMEWORK: Team Site Analysis Resaearch.

Week 12

MON

“Museum Annex: Site Analysis”

APR 3

CLASS: TEAM PROCESS RESEARCH Discussion

HOMEWORK: Team Site Analysis

WED

“Museum Annex: Site Analysis”

APR 5

HOMEWORK: Team Site Analysis

APR 10

PLEASE NOTE: LAST DAY TO DROP A CLASS WITH A MARK OF “W.”

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Week 13

MON

APR 10

“Museum Annex: Site Analysis”

IN CLASS: **Site Analysis Presentation**

HOMEWORK: Build group site model.

Begin sketching/diagramming partis and concepts.

WED

APR 12

“Museum Annex: Butterfly Pavilion”

HOMEWORK: Build 3 study models based on a parti of structure, sequence and program.

Week 14

MON

APR 17

“Museum Annex: Butterfly Pavilion”

WED

APR 19

“Museum Annex: Butterfly Pavilion”

Week 15

MON

APR 24

“Museum Annex: Butterfly Pavilion”

WED

APR 26

“Museum Annex: Butterfly Pavilion”

LAST DAY OF CLASS.

Week 16

MON

MAY 1

“Museum Annex: Butterfly Pavilion”

Study Week.

WED

MAY 3

“Museum Annex: Butterfly Pavilion”

Study Week.

Week 17

TUES

MAY 8

FINAL REVIEW: “Museum Annex: Butterfly Pavilion”

WED

MAY 10

PORTFOLIO DUE @ 5:00PM