Architecture 205a
Architecture for Engineers

University of Southern California – Department of Architecture

SYLLABUS

Spring – 2011

James Tyler, FAIA – Instructor/Director
Undergraduate Building Science Program
BUILDING SCIENCE
Architecture for Engineers

SYLLABUS

This is an interdisciplinary program with the School of Engineering and was established in the 1970s; the home base is the School of Civil and Environmental Engineering Studies. The three year program familiarizes the student with the disciplines of architecture, landscape architecture, planning, structural, mechanical and electrical engineering that are utilized to create the built environment for our society. It introduces the process of coordinating all of these aspects for the engineering student to help comprehend the nature of beauty in our surroundings. The goal is to create an appreciation and understanding of how and why this is established. The primary objective is to teach the student the intrinsic nature of architecture developed through principles based on clarity of construction.

Field trips and guest lecturers enhance the study by providing close contact with basic construction methodology. Each student is to go through the program and experience an appreciation for the arts and other senses that help them reinforce their understanding of the craft of building.

Students are required to participate in six semesters (two per year) of intensive afternoon design labs which are similar to the five year studios taken by architecture students; each class is in sequence and must be adapted to their knowledge of the preceding year. Each course, which provides four (4) units of credit, is an evolutionary process of developing prior information for refining their intellect toward the proper method of solving problems in a rational way. Each year is taught to assure continuity; students continue to perpetuate knowledge of the past year to integrate into their new projects. From time to time, projects of the previous class may be used as typology studies for utilizing newly gained information gained from the present year's study.

The Three Year Program will cover the following areas best suited to fit the needs of each student:

Architecture 205abl (each category of study is complimented with lectures)

| MATERIALS | Color          |
|           | Texture        |
|           | Pattern        |
|           | Form           |

| DRAWING   | Pencil        |
|           | Ink           |
|           | Computer      |
|           | Presentation  |

| VISUAL    | Axonometric   |
|           | Perspectives  |

| FORCES    | Water         |
|           | Sound         |
|           | Sun           |
|           | Gravity (Horizontal and Vertical) |

| HISTORY   | Ancient and Modern Building Systems |
|           |                                        |
| DESIGN    | Preliminary - Design Development - Models - Workings Drawings - Construction |
ARCHITECTURE 205abl
OVERVIEW

Each semester the students are responsible for completing a series of projects to move on to the Architecture 405 classes. Students are required to develop an understanding of basic design in architecture. Although they are primarily trained in engineering and the pragmatic aspects of that study, they learn to develop confidence in evaluating good architecture. To accomplish this they need to walk through a process of fundamental design understanding and graduate to the application of this knowledge into the design and construction of a building.

Fall Semester guides them through lettering, composition, color, texture, material, space and construction. Mini assignments that teach them about lettering, sketching and photography assist them along the way to prepare them for their final assignment of the semester, which is a medium sized building type.

Spring Semester is consumed with the evaluation of a program that outlines the design of a building. The student is to do research on the building type, i.e: Church, School or Office Building to prepare them for a full scale design of that particular building. Depending on the magnitude of the building type there will be one or two building studies during this semester. The student must prepare to design all aspects of the construction. This will include architectural, structural, mechanical and electrical layouts in schematic form to provide a complete theoretical study of a certain building type. The student is to provide the following for verbal and visual presentation to members of the school faculty.

The presentation will require the following:
- Site Plan
- Floor Plans
- Elevations
- Scale Model

There are no exams in the course. All work is visual. Homework is done by way of research and sketches that are reviewed by the instructor in class. Critiques are given to the student and they then re-work their concept for additional review until the student and instructor believe the project is an acceptable scheme to complete finished drawings and model. Grades are given at the completion of each project.

James Tyler, Instructor
Architecture 205a
- Fall Semester Schedule

First Week: Orientation, Outline of semester expectations, materials, time and projects.

Second Week: Meaning of Design - Project: Photograph Building - explain structure, do details

Third Week: Color - Musical Composition

Fourth Week: Texture - Movie Interpretation

Fifth Week: Pattern - a look at Nature

Sixth Week: Build a Cube & Sticks and Stones - create a composition of balance
Note materials: 12"x12"x12" black gator board cube for presentation, must be built as accurately as possible. Following construction of cube you are to erect a design composed of 12 sticks and 12 stones. Sticks are to be 8" long and 1/8" in diameter while the stones are to be collected in your yard and should be about the size of a quarter. Create a balanced composition that expresses emotion!! This should be constructed on a 12"x12" black gator board and glued. Concept to be reviewed with instructor before gluing...

Seventh Week: Construction Project Site Visit: evaluation and report on status.
* This project will be visited again from time to time at instructor's discretion.
the purpose of these visits will assist you in understanding construction. This building will extend into the Spring Semester and should be completed in May.

Eighth Week: Small Project: You will be required to design a small pavilion for a two week period. (building and site will be determined at that time)

Ninth Week: Small Project: Continued study with presentation drawings.

Tenth Week: Small Project: Completion of details and finish Model.

11th thru 15th Week: Medium Project: You will be required to solve the challenges of a medium sized building which will include drawings and model.

16th Week: Presentation Week: Verbal and visual presentation to faculty of final project.
Architecture 205b
Spring Semester Schedule

**Project #1  Historical Building**
- First Week: Review Project in Library & determine your building /structure to study.
- Second Week: Outline Architect/Engineer Profile and his Work
- Third Week: Drawings and Sketches of Building, Photo Reproductions
- Fourth Week: Prepare Presentation and Drawings.

**Project #2  Case Study House**
- Fifth Week: Determine Case Study House to Evaluate (see outline)
- Sixth Week: Floor Plan(s) in pencil and sketch paper
- Seventh Week: Framing Plans and Elevations with pencil and paper
- Eighth Week: Model preparation and Final Review w/Model & Plans
  Note: All drawings and model to be 1/8"=1'-0" scale (in lieu of 1/4")

**Project #3  Construction Study (Wood, Masonry and Concrete)**
- Ninth Week: Evaluation of Building Types and Introduction of Project #4
- Tenth Week: Semester Break............

**Project #4  Major Building Design**
- Eleventh Week: Review Program Criteria for Building Type: Wood, Steel or Concrete
- Twelveth Week: Student to determine building type of construction for new project
- Thirteenth Wk.: Schematic Design of Site
- Fourteenth Wk.: Preliminary Floor Plans and Elevations
- Fifteenth Wk.: Framing System Drawings and Details
- Sixteenth Wk.: Finalize Drawings and Model
  Note: All Drawings and Model to be 1/8"=1'-0"
Architecture 305ab - (prerequisite Arch 205)

LECTURES  Structural analysis
Primary Forces: sun, wind, rain and gravity
Natural Forces on Structures: Wind, Seismic and Hurricanes
Building Systems: structural, mechanical & electrical
fenestration, moisture protection and finishes

MATERIALS  Concrete
Steel
Wood
Off the shelf products
Synthesizing products to buildings
Relationship of structure to infill products

PROJECTS  Small projects to determine relationship of structure to architecture
Each problem provides program requirements for varied Case Studies
Four or five week designs related to complexity of problem

Architecture 405ab - (prerequisite Arch 305)

Within each semester, the student is required to develop skill in the following areas:
  a. identify, formulate and solve engineering problems
  b. to have a knowledge of contemporary issues
  c. apply knowledge of science, mathematics and engineering principles
  d. to use engineering skills as an application practise
  e. to be able to participate on multi disciplinary teams
  f. to communicate fluently and orally
  g. to develop application of computer skills
  h. have understanding of ethical and professional repressibilities
  i. to design components of engineering system to meet give constraints
  j. to utilize laboratory and analysis for interpretation of data

During Spring Semester students will be consultants to the 5th Year Architectural Thesis Student
to assist in developing structural ideas for a complex structure

This is a hybrid program wherein the combination of architecture and engineering dovetail into a
marvelous educations for each student. Each semester Building Science students are required
to conduct themselves as professionals working in an office environment. They are to develop
an understanding of teamwork and social skill to enhance relationships with employees and
clients. Presentations are made by each student to their classmates and faculty to promote
speaking skills and confidence in challenges that may occur during their lifetime working
conditions.

At the conclusion of their requirements for graduation, every student is required to design and
complete a Portfolio of their three year experience with examples and descriptions of their work.
This Portfolio has proven to be beneficial in applications for employment.

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