

Architecture Design II [ARCH202] **FALL 2009**

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Course hours: **M-F** 2:00 to 7:00 (Wednesdays: optional office reviews with KN and MT)

Rhythmic Nature

In its domain, architecture represents the dialectical relationship between space, matter and structure. It achieves to be a philosophical re-interpretation of geometries and proportions in order to encompass a usage. In that, it learns heavily from Nature, and borrows its methods and materials in order to re-interpret them, re-invent them into man-made form. In nature, structural integrity is inherent in every form, and the behavior and performance of these forms rely primarily on their structural composition.

The design of structures is a creative and experimental progress that should be understood and mastered by architects. In architecture as in nature, form and structure are inseparable, any structure renders a form and any form has its structure. The course aims to impart this dialectic relationship by simultaneously exploring structural systems, their artistic expressions, and their relationship with space and matter.

The studio will aim at exploring various modes and methods of construction through understanding structural behavior, its significance on various materials, and its application on the design of form and space. Throughout this course you will be tempted to look at nature and consider its relationships. This course is orientated towards exploration, invention and experimentation. Students are required to engage in the design process by the making things and testing them through models and mock ups at various scales.

A. First exercise: **Tree analysis (week 1)**

1.1

Choose a tree on campus and sketch it broadly. Try to capture the impression. Take different angles. The faster you draw and the less lines you need for capturing the impression the better. Use thick and soft pencils or carbon.

Deliverables: date and quantity and size of presentation?

1.2

Measure the tree broadly and geometrize it. Research on proportions that could be applied as golden section, division ratio etc.

Deliverables: date and quantity and size of presentation?

1.3

Analyze the loads and forces that impact the tree, as wind, gravity and analyze the flow of loads within the tree. Render these forces with different colors and distinguish pressure and tension.

Deliverables: date and quantity and size of presentation?

1.4

Choose a detail where the forces divert in different directions and build a model as a wire frame

B. Project 1: **The Tree pavilion (3 weeks?)**

2.1

Site and Program: Select a site on campus from which you will create a student pavilion and outdoor studio space.

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2.2

Drawing from the tree exercise, return to your tree of inquiry, this time exploring the smaller scale forces occurring within the organism. Zoom in to the smaller scale of the leaves, the branch fibers or the bark membranes. Research the cellular/molecular level of the "internal structure" of your tree. Again, create quick sketches in order to build a model that re-interprets the geometry of your discoveries. Explore a minimum of three iterations.

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2.3

Assembly of units: Begin to consider how your findings can be expanded upon in a modular fashion. Take one of your models/building units and begin to create volumes by assembling them. Consider how one can vault, cantilever, bridge. Begin to consider how the use of different materials (such as steel, wood, glass) contributes to your structure, your programmed space and your overall design vision.

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C. Project 2: **A Dancer's theme (5 weeks)**

3.1

Acrobatic Structure: Consider the human body - Choose 3 of the given pictures and draw figurative interpretations. Simplify the human bodies in your drawing and render it as abstract objects. Build various sketch models at different scales. Consider possible alterations and re-assemblies. This will be your primary acrobatic module.

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3.2

Choose one of the objects and build presentation model at a 1/2 scale. Consider compression points and build an assembly model by stacking the objects following a certain pattern. This pattern can be described from a specific dance maneuver or rhythm (You could consider still frames of a motion clip or Muybridge still photography, etc...)

Deliverables: date and quantity and size of presentation?

3.3

Application to site: Consider the assembled model and apply it to site, an empty narrow lot between 2 buildings (TBD). Your program is to create a personal dance space. The new assembly should respond to the site conditions, and consider new modes of connection to the building/ground. Take into account possible tensile forces and stabilization connections. Experiment with different materials, considering their strengths and weaknesses, transparencies and formalistic properties.

Deliverables: date and quantity and size of presentation?

References

Architects/ Designers/Writers

Violet le Duc / Gaudi/ Nervi/ Buckminster Fuller

Santiago Caltrava

Janine Benyus and Biomimicry

Jurgen Mayer H.

Books

Verb Matters, Architecture boogazine, Actar publishers

Constructing Landscape, Materials, Techniques, Structural components

Links

<http://fourof7.blogspot.com/>

<http://synchronousobjects.osu.edu/>

<http://www.biomimicry.net/>