

# Arch 3590 | Fall 2019 Parametric Computation, Materials and Fabrication

Wed: 8:30am - 10:35pm V-834B | Fri: 8:30am - 10:35pm V-833 Department of Architectural Technology Prof. Yevgeniy Koramblyum (ykoramblyum@citytech.cuny.edu) New York City College of Technology Prof. Ravi Raj (rraj@citytech.cuny.edu) City University of New York CLT: Laurin Moseley (laurin.moseley@mail.citytech.cuny.edu) 300 Jay Street, Brooklyn, NY 11201

## PROJECT 02: MODULATING LIGHT

### CONTEXT

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“A great building must begin with the unmeasurable, must go through measurable means when it is being designed and in the end must be unmeasurable.”

—Louis Kahn

### OBJECTIVE

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In this assignment you will develop an architectural module to function as a sun shading device, or brise-soleil. The challenge is to develop a repeatable element that aggregates to form a partition that modulates light between two sides. For the purposes of this project, you will be given a site on which to situate your design. You are going to explore light and shadow patterns using subtractive fabrication tools (CNC mill) to create apertures through your module. The manner in which your module stacks or connects to adjacent modules is central to the overall effect of light modulation.

### MATERIAL

:

Blue foam, High-density foam, Plaster

## **FABRICATION**

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Craftsmanship; Structural Stability; Expression of Construction Methodology

## **REFERENCE**

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Digital Fabrications: Architectural and Material Techniques by Lisa Iwamoto. Princeton Architectural Press, 2013. Erwin Hauer: Continuaby Erwin Hauer. Princeton Architectural Press, 2007. Solar Control & Shading Devices by Victor Olgay. Princeton University Press, 1957.

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## **SITE**

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Your site is to replace the existing concrete barrier that encloses a courtyard for the Dorje Ling Buddhist Center located at the intersection of Gold and Front Streets in Vinegar Hill. Your task is to create an enclosure that defines a courtyard yet allows light to permeate into it. You will be provided with a Rhino model of the site.

Dorje Ling Buddhist Center - 98 Gold Street, Brooklyn, NY 11201

## **ASSIGNMENTS**

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## PROJECT 02 / PART I - Due Wednesday, October 16, 2019

**Precedence Study / Concept Sketch** - For this part of the project you are required to research a precedent study of a facade that filters light using a module. Your presentation should include information about the project (name, location, size, date completed) and define both the a) overall effect of the facade and b) geometry of the module.

Using your precedent as a reference, you will sketch out **3 module prototypes** based on you concept. Document each step of your investigation.

### Deliverables (11x17 PDF format):

- Precedent study photographs, info, and diagrams
- Sketches of 3 module prototypes

### Things to consider:

- How does you module filter light?
- How does you module stack or connect to adjacent modules?
- What is the overall effect of your module when aggregated to form a screen?

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## PROJECT 02 / PART II - Due Friday, October 18, 2019

**Digital Model**- Create a 3D model of one of your prototypes on the computer. The minimum cubic volume of your module is 12x12x4. Document each step of your investigation. **Note:** The maximum depth of the CNC milling bed is 3" thus you will have to glue two pieces of foam back-to-back to create your module.

**Site Model** - Using your module, create a 3D model of your screen wall along the given site. The minimum height of your screen is 8 feet. Use a render setting to simulate how light will filter through your screen wall..

### Deliverables (11x17 PDF format):

- 3 screenshots (minimum) of your module
- 3 renders (minimum) of your screen wall on the given site (including context)

## PROJECT 02 / PART III - Due Friday, October 25, 2019

**RhinoCam Model / Initial Prototype** – For this step of the project, you will develop milling profiles for your module using RhinoCAM.

You will explore different milling techniques related to the geometry of your module. Using either blue foam, you will mill your initial prototype at 1:1 scale. **Note:** A sign-up spreadsheet for the Fabrication Lab will be provided.

**Deliverables (11x17 PDF format):**

- 3 screenshots (minimum) of your RhinoCAM file
- 3 screenshots (minimum) of first prototype

**PROJECT 02 / FINAL - Due Wednesday, November 6, 2019**

**Final Prototype:** Learning from your initial prototype, adjust your module and milling settings to further refine your design. Using blue foam or high-density foam, you will mill a minimum of (3) final prototypes of your module. Your modules should be able to stack/attach to form a freestanding representation of your screen wall.

**Final Deliverables (11x17 PDF format):**

- Precedent Images
- Initial Sketches
- Plan/Elevations/Sections of your Module
- Exploded Isometric/Axonometric with Details of how the Module is formed and assembled
- Rendering of the screen wall on site
- Photos of models showing shadows/light
- Initial Prototype (1 module minimum)
- Final full-scale Prototype (3 modules minimum)

**Note:** Sections should show geometry in the background. To get the best quality photos you should photograph these in natural sunlight.