

Arch 3590 | Fall 2019

Parametric Computation, Materials and Fabrication

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

PROJECT 01: LIGHTNESS OF PAPER

CONTEXT:

“All material in nature, the mountains and the streams and the air and we, are made of light which has been spent, and this crumpled mass called material casts a shadow, and the shadow belongs to light.”

—Louis Kahn

OBJECTIVE:

Light can transform the way we perceive a space, a wall, or a surface. For this project treat light as form. The challenge is to construct a sculptural object that emits variations of light intensity. You may use folding and layering techniques for structural stability. You are going to explore light and shadow through patterns, layering and variations of apertures to create a material effect. Consider researching methods of creasing, pleating, folding, cutting, scoring for form finding. Limit how many of these you incorporate. You may use paper tabbing as a means of connecting various parts or ingeniously create a type of paper hinge. Another challenge you may choose to explore when shaping would be to use no glue whatsoever.

MATERIAL:

Bristol Board Paper

FABRICATION:

Craftsmanship; Structural Stability; Expression of Construction Methodology

DELIVERABLES:

PART I - Due Friday, September 6, 2019

Light as Idea - For this part of the project you are required to research paper creasing, folding, origami, cutting, layering, scoring and patterning to create a material effect. Using bristol board paper come to class with a minimum of **3 prototypes** exploring these concepts.

Document your process through photography/video. Document each step of your investigation. Think of these steps as rules. These rules will form the basis of an algorithm. You may use bristol board paper for your prototypes. Once you have documented your prototypes place the photos into a document using software of your choice on an 11x17 landscape format.

You will also be required to find precedent images and lay these out. Use the same format described above.

Note that photos of your prototypes should be described as such while precedents will have their own descriptions.

We will share with you an InDesign/Illustrator template file that you are welcomed to use to layout your work.

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Things to consider:

- How does cutting affect the integrity of paper?
- How does layering, folding, pleating, or creasing affect the stiffness of paper?
- How do your prototypes attempt to mediate light?

Submit a link to us all via email to your multi page pdf on your dropbox/google drive.

Your email subject should be as follows:
ARCH 3590 Project 01 Part 1.

PART II - Due Friday, September 13, 2019

Light as Form - Create a 3D model of one of your prototypes on the computer. Minimum cubic volume of your lamp is 12x12x12. Note that volume does not mean footprint. As you build your model, document each step of the way. Keep track of all of the operations you are performing in the model to achieve the form you prototyped by hand. **Geometrically break it down.** Consider IKEA building instructions and make your own building instructions guide except that in this case the model itself is a recipe for reproducing the geometry of your prototype. Capture a minimum of 3 screen grabs. When submitting you must provide the rhino and or grasshopper file as well as the screen grabs.

Email us a link to the files. Your email subject should be as follows:
ARCH 3590 Project 01 Part 2.

PART III - Due Friday, September 20, 2019

Prototyping Form | Computationally Made – For this part of the project you will further develop your light sculpture using rhino and grasshopper. How would you develop the steps you performed in the previous model with grasshopper? How might you fabricate the model? Create partial files for fabrication and test your building methods at 1 to 1 scale. You may create these with grasshopper or you might just develop these by hand or with Rhino. The important thing is to explore connections at 1 to 1 scale. Document your partial 1 to 1 fabrication test. Submit photos as well as rhino and grasshopper files.

Email us a link to the files. Your email subject should be as follows:
ARCH 3590 Project 01 Part 3.

PART IV - Due Friday, September 27, 2019

Prototyping Form | Handmade – for this part of the project you are going to physically explore the developed version and consider limitations of tools and materials. You should be considering assembly and the tools and methods discussed in class as a basis for construction. Document your prototype and develop your grasshopper definition. Submit photos of your prototypes as well as rhino and grasshopper files.

Email us a link to the files. Your email subject should be as follows:
ARCH 3590 Project 01 Part 4.

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FINAL - Due Friday, October 4, 2019

- Concept Images
- Plan/Elevations/Sections of your Lamp
- Exploded Isometric/Axonometric with Details of how the Lamp is assembled
- Rendering of overall form
- Finished Model, Partial Model (Part III + Part IV), Prototypes (Part I) = 6 Models Min!
- Photos of models showing shadows/light

Email us a link to the files. Your email subject should be as follows:

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