

FORM

DESMA 22

Fall 2018
Tues / Thurs 2-4:50pm
2250A (fabrication Lab) Broad Art Center

Professor: Isla Hansen - islahansen@ucla.edu
Office Hours: Tues/Th 12-2 and by appointment

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Course Summary

This project-based class is a studio / lab that explores foundational concepts and techniques behind the creation of new 3D forms, making use of both digital and physical fabrication tools. Through a formal language provided to us via digital modeling, design, and fabrication tools, we will translate physical materials and ideas into 3D objects. The concepts we will explore as a group include physical and sensorial properties such as scale, weight, materiality, and connectivity, as well as function, transformation, translation, and interactivity. In this introduction to polygonal mesh, solid, and surface geometries and construction techniques we will cover additive and subtractive processes, joinery techniques, pattern-making from surfaces, rapid prototyping techniques, and general use of shop machines and tools big and small. This includes the use of lab equipment such as the laser cutter, the CNC-Router, 3D printer, sewing machines, and saws and power tools, as well as a basic introduction to foundational wood, foam, and fabric construction techniques. Our experimentations will prompt us to consider relationships between objects, between objects and bodies, between bodies and technology, between technology and form, between form and language, and between computer code and visual design. Based on your own experiences, aesthetic and design sensibilities, interests, and research, you will also use this course to explore your own set of more personal and political themes, concepts, and your own personal aesthetic language, as you begin to create your own definition of form.

Schedule of Assignments

- 10/2 Plans for Polygons Project (posted to blog)
- Various Artist Presentation (in class and posted to blog)
- 10/11 Documentation of Polygons Project posted to blog
- 10/11 Plans for Curved Surfaces Project (posted to blog)
- 10/18 Documentation of Curved Surfaces Project posted to blog
- 10/18 Plans for Boolean Operation Project (posted to blog)
- 10/23 Finished (painted/coated) Polygon or Curved Surface
- 10/25 Documentation of Finished form posted to blog
- 10/25 Illustrator plans for Boolean Operations project
- 11/6 Documentation of Boolean Operation Project posted to blog
- 11/6 3D model (posted to blog)
- 11/8 Draft I - Group Plans for Yuckyminster Gumdrops - macro form and connector sketches
- 11/9 Draft II - final Plans for Yuckyminster Gumdrops - both macro structure and micro forms
- 11/20 Presentation of 2 Plans for Final Project (presented and posted to blog)
- 12/14 Documentation of Final Project posted to blog

Sometime between 12/7 - 12/12- shoot room documentation session

Schedule of Projects

- 10/9 (2:00) Polygons
- 10/16 (by 3:30) Curved Surfaces
- 11/1 (2:00) Boolean Operations
- 11/15 (by 4:00) "Yuckyminster Gumdrops" (group project)
- 12/6 (2:00) Final Project - Interactive Object

PROJECT DESCRIPTIONS

10/9 (2:00) Polygons

Make 3 different polygonal forms out of wood. Here are the rules:

- 1) At least one should be a cube (6 faces, 12 equal edges, and 8 vertices)
- 2) At least two forms should be hollow (like a box), made from surfaces (not solid all the way through)

Possible construction techniques include surface patterning, stacking, or a purely subtractive construction technique could result from cutting and sanding until you have your form. The edges of your surface-polygon can connect in any way. You can use glue, hardware, pressure fitting construction techniques, and other materials if you need them to make your faces fit together.

How big are your polygons? How many faces, edges, and vertices do they have? What are the measurements of its faces? What are the measurements of the depths of its edges or faces (i.e. what is the thickness of your material and how will this effect your

form)? How much materials will you need? How will you connect the faces of your cube and shapes together? What is the order of operations for constructing your forms?

You may end up making multiple cubes and more than 3 polygons to get this right. Please let me know which are your final 3 forms, but turn in all forms for your grade.

10/16 (by 3:30) Curved Surfaces

Construct a three dimensional form with curved edges round. I encourage you to design for soft materials, such as foam or fabric, and create a pattern for your surfaces. Your final form will be “hollow,” or stuffed. How will you turn flat materials into a round shape? What method will you use to hold these surfaces together? What are the measurements of your curves? Where do these measurements appear in your 2d plan or pattern? How much material will you need? Where will you get your material? What is the order of operations for constructing your curved 3d shape? What is on the inside of form, or what is it filled with?

You will likely end up making multiple forms to get this right. Please tell me which is your final shape, but turn in all forms throughout your process for a grade.

11/1 (2:00) Boolean Operations

Design a form based off one of your polygons or even your curved surface shape. This is a new form that will in some way hold, contain, fit with, or into, one of your previously made forms. Your new form could create a reiterative structure from one of your polygons, building off of it, an addition that in some way locks into your original form (think legos or stacking pots); or your new form could combine two of your primitive polygons / shapes; or you could think of your new form like a container or vessel for one of your polygons / shapes. Conceptually, think of this as a boolean operation. If you need to make adjustments to your original form, you may. You could and should make use of digital tools to plan and fabricate this boolean container / iteration — including illustrator, the laser cutter, the CNC machines, etc — but you are not absolutely required to use these. Extra credit if you design more than one iteration.

11/15 (by 4:00) “Yuckyminster Gumdrops”

For this project you will work in groups of 3 or 4. Your project is to work on two forms at once. The first form, your “macro” form, is a large geometric shape made of linear edges (think Buckminster fuller-esque geometries, but your form could more or less abstract or even representational). Your linear “edges” are made from a material that will be assigned to you (you will have round wood dowels, square wood dowels, pvc pipe, or foam tubes). The linear edges of your macro shape are connected together at their vertex points by solid “micro” shapes which are hardware pieces designed to hold together an intersection of multiple linear edges. While your macro forms will be designed as a group, the most important part of this project to make that shape work is designing your micro vertex connecting hardware forms. The labor of this work can be split up, but there should be a design consensus about how these will work together. These micro forms could be 3d modeled and printed, laser cut, or in some other way built. These connector vertex forms function like hardware, but they should be creatively, uniquely, and aesthetically designed. **At least one connector form must be 3D printed.** (And if you can print 1, why not more?)

12/6 (2:00) Final Project - Interactive Object

For this project you will design a functional object to be interacted with by a human. I suggest choosing one of the following forms to design: a functional new invention or everyday functional form; a new tool; a vessel or a receptacle for a found object; or a performative object such as a wearable or puppet. Questions to ask yourself are what does the object do and why? Who uses it and for what? What does the interaction look like, and how does the objects shape inform, enhance, or subvert this interaction. How does the scale, shape, and material of the object relate to who is interacting with it and for what purpose?

During the final in-class critique, the object's function must be activated in some. This can occur live, but must also occur in photo and video documentation.

Logging Shop Hours

As part of your daily / weekly assignments, you will be asked to log the amount of time you spend in the shop. There will be a Form class log book kept at the front of the shop. Please notate the time you enter and the time you leave. The number of expected weekly hours based are suggested in the assignments each day. You are expected to make valuable use of your shop access.

Artist Presentation Dates

These are 4-8 minute research presentations on an artist of your choice. What are they doing, how are they making it, what does it mean, what is significant about this work in a social, historical, and art context? What do you think about the work or artist or how might it inspire you to think differently about your own work. These will take place every week, sometimes twice a week. I recommend choosing an artist from the reference page, but you may choose someone off the list if you want. Choose 1-4 works by the artist and discuss in depth with images.

Course Schedule

This schedule is subject to changes. It will be updated online and I will notify you of dramatic differences in class and, if necessary, via reminder emails.

WEEK 0

9/27

Introductions and Expectations
Shop safety training begins

WEEK 1

10/2

Due: Plans, prototypes, and pieces for Polygons Project
Review Polygons Plans - discuss / demo construction methods
Shop training continued

Assignments:

*Work on Polygons project
You should be logging at least 1+ shop hours between T/th classes*

10/4

Artist Presentation 1
Shop training and demos continued, work time on Polygons project

Assignments:

*Finish Polygons project
Log at least 3 shop hours*

WEEK 2

10/9

Due: Polygons Project
In class project review / critique
Artist Presentation 2
Lecture: on cubes, curved surfaces, and next project

Assignments:

Post Documentation of Polygons Project to the blog

*Reading - packet of plan examples
Curved Surfaces links and references on the website
Curved Surfaces Plan should be posted to the blog by Thurs at 2*

Curved Surface Plans should have: 3+ drawings, materials (soft?), construction methods (i.e. drawing of deconstructed form), budget, and a new element: a narrative and justification (these can be fictional)

Why does your curved surface appear the way it does? What will you call your curved surface? Who are you building it for? Does it serve a function? Where does it belong? What would its ideal scale be if you could make it bigger (or smaller) ?

10/11

Artist Presentation 3

Due: Documentation of Polygons project to the blog
Due: Plans for Curved Surfaces Project - review as a group
Curved surface construction techniques and demos, work time on project

Assignments:

Log at least 3 shop hours

Work on Curved Surface Project

WEEK 3

10/16

Work time on Curved Surface Project

Due at 3:30 - Curved Surface Project

Artist Presentation 4

Critique, intro to Boolean Operations Project

Assignments:

Post documentation of Curved Surface Project to the blog

Reading: Painting and Finishing instructions sheets

Boolean Operations Review sheet

<http://thingsfittingperfectlyintothings.tumblr.com/>

Plans for Boolean Operations Project due

10/18

Artist Presentation 5

Due: Documentation of Curved Surface Project

Due: Plans for Boolean Operations Project - plans should be posted to blog

Finishing / Painting Demo day

Assignments:

Finish/paint at least one of your cubes, polygons, or curved surface forms. Extra credit if you finish more than one.

Log at least 2 shop hours

Begin Illustrator Tutorials

WEEK 4

10/23

Artist Presentation 6

Due: Finished / painted polygon or curved surface

Primitives Arrangement game, Boolean Operations, Intro to Illustrator and Laser cutter demo, work time

Assignments:

- Post documentation of finished (painted/coated) form to the blog

- *Translate your plans for a boolean operations to illustrator. Email me if you have issues, or want me to check them. Do test cuts on the laser cutter in cardboard first, before full scale on CNC or before using other materials in the laser cutter.*

Log at least 2 shop hours (these can include laser cutting time)

Continue Illustrator tutorials

10/25

Artist Presentation 7

Due: Documentation of finished form posted to the blog

Due: Illustrator plans for Boolean Operations project

Illustrator, CNC software, and CNC demos

Work time for Boolean Operations project

Assignments:

Work on Boolean Operations project, remember extra credit if you make more than one iteration!

WEEK 5

10/30

Artist Presentation 8

Work day for Boolean Operations project

Assignments: Finish Boolean Operations project

11/1

Due: Boolean Operations project

Critique

3D modeling introductions

Assignments:

Documentation of Boolean Operations project posted to the blog

Maya Tutorials / Fusion 360 / Blender Tutorials

As you are doing the tutorials, make something in either program, I will review this in class Tuesday

WEEK 6

11/6

Artist Presentation 9

Due: Documentation of Boolean Operations project posted to the blog

Due: 3D model assignment - screen shot posted to the blog

3D modeling demos continued, History of 3D modeling, intro to group project 3, groups and materials assigned

Assignments:

Meet as a group!

Create plans for Yuckyminster Gumdrops Forms - make a group macro plan document and as individuals start modeling vertices. Come to your group Thursday with a few different plans for vertices. Try modeling them in 3D

11/8

Artist Presentation 10

Due: Group Plans for "Yuckyminster Gumdrops" macro structure

Individual sketches / drafts / models for micro "Gumdrop" Vertex Hardware Forms

Group and Individual Work time for "Yuckyminster Gumdrops" Project

Assignments:

Model your vertex hardware forms, meet up with your group to discuss

Begin 3D printing / constructing your vertices, cut lengths of "linear edge" material

Due Friday 11/9 posted to blog by midnight: Draft II - final Plans for Yuckyminster Gumdrops - both macro structure and micro forms

Reading:

TBA - Fred Turner Buckminster Fuller reading

WEEK 7

11/13

Artist Presentation 11

Work time for "Yuckyminster Gumdrops" Project

11/15

Due at end of class: Yuckyminster Gumdrops group project

Work time for "Yuckyminster Gumdrops" Project

Assignments:

- Read Maya Lin article

- Bring in an example of or draw an image of or make a rendering of an object that is very important to you. Why it is important to you? What is its function?

- Read assignment for final project. Draw up two plans / proposal that you will present to the class on Tuesday. Due Tuesday as blog post and as presentation.

WEEK 8

11/20

Artist Presentation 12

Due: 2 Plans for Final Project (presented and posted to blog)

Presentations, Interactive Objects in art and design, work time and individual discussion

Assignments:

Choose one plan for your final project and re-make your plan

*Begin fabrication tests and come to class with material options, tests, etc., ready to fabricate!
Log at least 1 shop hour when you get back from Thanksgiving !*

WEEK 9

11/ 27

Artist Presentation 13

Work time final projects

11/29

Artist Presentation 14

Work time final projects

WEEK 10

12/4

Work time final projects

12/6

Due: Final Project

Final Critique

Sometime between 12/7 - 12/12- scheduled shootroom for documentation help

Due by 12/14 - Documentation of Final Project posted to the blog

CLASS POLICIES & RECOMMENDATIONS

Recommended Equipment

Sketchbook (I recommend graphing / gridded)

Pencils / pens

Laptop + 3 button mouse

Camera / cell phone with camera

Optional:

Scissors, tape, glue, calculator, measuring tape

Supplies for each project (find / purchase your own or purchase limited materials / quantities in house)

Initial Software to Download

Illustrator (adobe)

Maya (autodesk)

Fusion 360 (autodesk)

Slicer for Fusion 360 (autodesk)

Photoshop (adobe)

Blender

Enrollment Cap

This course is held in the fabrication lab. The safety policies regarding the number of students able to work in the shop at one time exist for good reason, and so this class has a strict cap of 14 students. There is no flexibility. Students who are enrolled **and present** during the first class will have priority for enrollment. If you do not get in to this class this quarter, please try again next quarter.

Attire

(Direct from Fab Lab Safety Manual!)

- Proper shop clothing must be worn at all times, including long pants and closed-toe shoes. Sandals and flip flops are prohibited. (Heels are not advised either)
- No loose clothing may be worn, including ties, scarves, loose sleeves, and loose skirts.
- Remove loose jewelry before beginning work; including rings, necklaces, bracelets and watches.
- Long hair must be pulled back and secured and contained; long beards must also be contained.

Attendance Policy

Students are expected to be present and on time to class every day. Absences should be excused by a doctor's note, comparable documentation, or an email from me a week in advance in which I say you are excused for a valid reason. Your 2nd unexcused absence will result in a 2% drop in your final grade, your 3rd, a 4% drop, your 4th, an 8% drop, your 5th, 16%, etc. If you are over 30 minutes late it will count as an absence unless you are excused.

Please note: All "work days" on the syllabus are for working on projects and you are required to be in class. This is not an opportunity to work at home. This is the only time your class and only your class will have individual shop time. The lab / shop is open and there for you to use — so be ready to work!

Grade Breakdown:

Attendance

This can only work negatively for your grade as described in the attendance policy.

Participation - 15%

Verbal, critical, and informed participation in class. Productive use of lab hours, work time, and attendance could also effect this grade.

Assignments (15) - 25%

Completed on time, assignments and presentations will be graded on concept, execution, and effort. Each assignment will be graded out of 5 points. This will include quality of blog post.

Projects (4) - 60%

Completed on time, projects will be graded on concept, execution, and effort.

Project I Polygons- Due Oct 9 - 8%

Project II Curved Surfaces - Due Oct 16 - 10%

Project III Boolean Operations - Due Nov 1- 12%

Project IV (group) Due Nov 15 - 14%

Project V Interactive Object - Due Dec 6 - 16%

A: 90-100, B: 80-90, C: 70-80, D: 60-70, F: 60 and below

Projects and assignments may be turned in up to four days late with a 10% deduction. Projects and assignments handed in any later cannot be accepted, as this course is so short and will move quickly! You may re-do any project or assignment you have already handed in on time for a chance for another grade. You may do this at any time and I will re-grade the work with a 5% deduction.

Disability services

UCLA strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on a disability, please let me know as soon as possible. It is necessary for you to register with the UCLA Center for Accessible Education so that we can establish reasonable accommodations. Please register here: <http://www.cae.ucla.edu/>. After registration, make arrangements with me to discuss how to implement these accommodations.

Statement on Title IX & Civil Liberties

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses, just as discrimination based on race / ethnicity are. If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at the UCLA Title IX office here:

<https://www.sexualharassment.ucla.edu/>

Also check out the UCLA Civil Rights Project for resources, tools, and research projects regarding racial / ethnic equity and securing civil liberties / educational opportunities for historically under-represented groups. Their website is here:

<https://www.civilrightsproject.ucla.edu/>