Design Communication II /// ARCH 222 /// AAA /// Spring 2016
Instructor: Philip Speranza, Assistant Professor
Graduate Teaching Fellow: Sam Clagett

Exercise 2.1a Purpose
The purpose of this exercise is to understand unit and organizational systems. **Parameters** in each unit will be tested. Geometry should be done in Rhinoceros. Line weight and color should be added by layers in Adobe Illustrator.

Project 2.1a Description /// Organizational Systems: 2D Tiling (please see example and template below)

operation **1, UNIT**: Design patterns in two dimensions.
Begin with a primitive unit geometry that is easily replicated: triangle, square or hexagon. (layer "organization.")
Design an **assymetrical** geometry within the primitive unit geometry. This will be called the **unit module**. (layer "lines")

operation **2, ORGANIZATION**: Replicate the unit module using a folding (mirror), move or rotate techniques
shown in lecture. As you replicate each **unit module incrementally** vary the amount of scale, rotate or move of a **curve** or **point**. Test this with 4 x 4 replications. Change parameters of the unit module, replicate and see emergent patterns **between** the unit modules. Test **iterations** taking control of the emergent effect by changing parameters.   ***Test at least three parametric variations and print each one for Thursday.**

operation **3, COLOR**: Finally, add one more parameter with using layers in Rhino to add color. In Illustrator use
"_select _same by _stroke and fill". You may change some closed shapes from "strokes" to "fills."

* Carefully control line weights and line types. Include the rules for each step of your process concisely describing, in minimal words and numbers, your Rhino commands (ex. "_rotate_60") ** Turn the "organization" layer off as a final step.

Deliverables
[1] 11" x 17" color drawing including sequential
diagram steps and 9" x 9" tiling pattern.

Programs
Rhinoceros 3D, Adobe Illustrator

Learning Objectives
•To create analog parametric systems in Rhino.
•To effectively add lineweights and explain steps
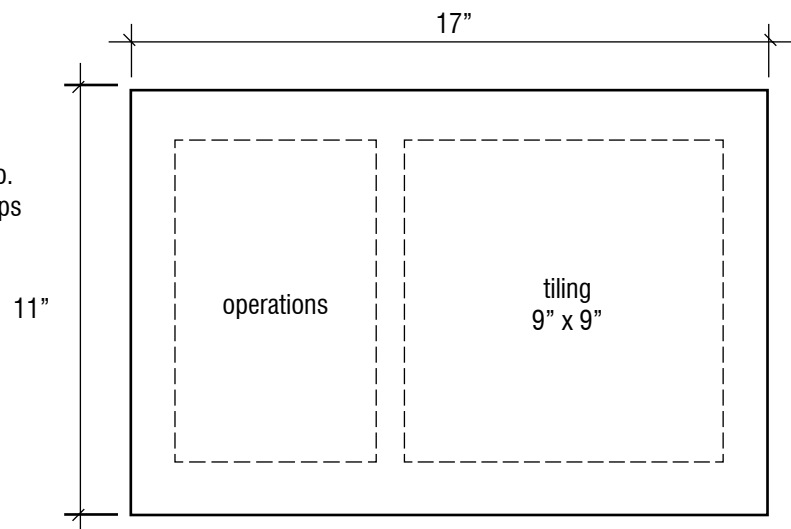in text in Adobe Illustrator using layers.

Evaluation Criteria:
•Proficiency in 2D geometry in Rhino 3D.
•Ability to use Adobe Illutrator to effectively
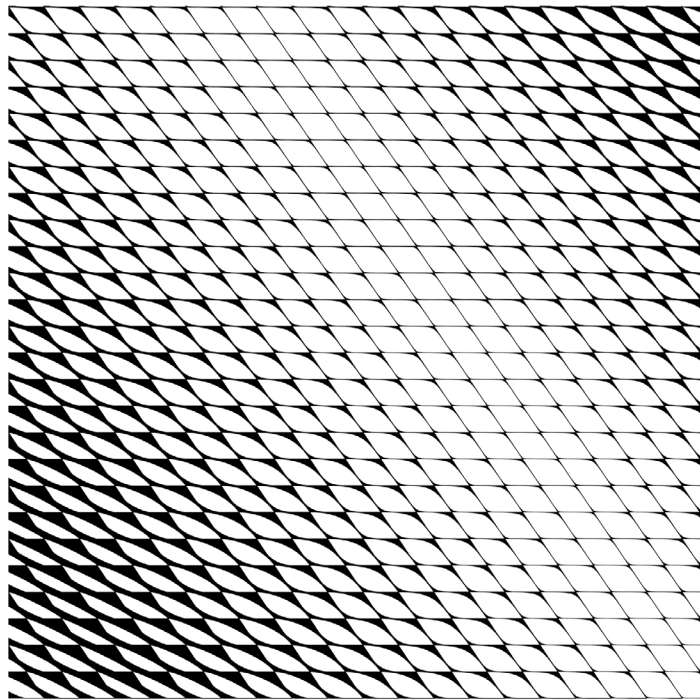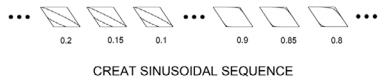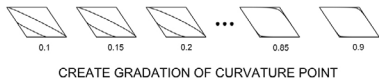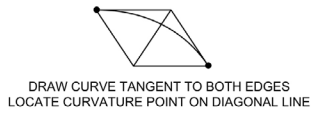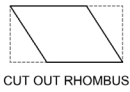 complete a drawing for presentation.

Schedule:
Assigned: Tuesday, April 19
Upload Due: 11:59pm, Monday, April 25
Print due: 10am, Tuesday, April 26

17"

11"

operations

tiling
9" x 9"

CUT OUT RHOMBUS

DRAW CURVE TANGENT TO BOTH EDGES
LOCATE CURVATURE POINT ON DIAGONAL LINE

TAKE MID POINTS
REPEAT STEP 2

0.1   0.15   0.2   ...   0.85   0.9

CREATE GRADATION OF CURVATURE POINT

...   0.2   0.15   0.1   ...   0.9   0.85   0.8   ...

CREAT SINUSOIDAL SEQUENCE

COLOR AND ALIGN SEQUENCES

1
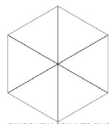
DIVIDE HEXAGON INTO SIX TRIANGLES.

3"

DELETE ALL BUT ONE TRIANGLE.

CONNECT MIDPOINTS, FORMING THREE NEW TRIANGLES.
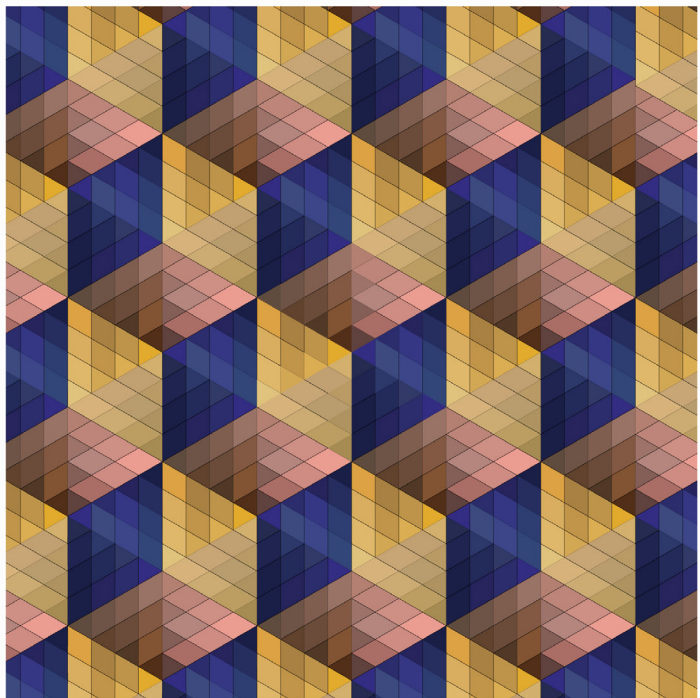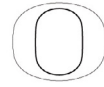
CONNECT MIDPOINTS AGAIN.

DELETE LINES.
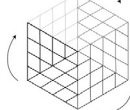
ROTATE TRIANGLE 60° CLOCKWISE UNTIL HEXAGON IS FORMED.

2

3   FIX LINE WEIGHTS, APPLY COLOR, AND TILE HEXAGONS.

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Exercise 2.1b Purpose
The purpose of this exercise is to learn Grasshopper! This is digital parametric design.

Project 2.1b Description /// Organizational Systems: 2D Tiling
Use the Rhino Grasshopper definition template on the serve to create iterations of a tiling pattern (not necessarily 2.1a).

Deliverables
[1] 8 1/2" x 11" black and white series diagram using the template below. Please crop a JPG for the website upload.

Programs
Grasshopper, Rhino, Illustrator
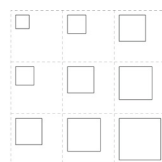
Learning Objectives
• To create digital parametric systems in Grasshopper
• Grasshopper: organization, parameters, "bake" to Rhino

Schedule:
Assigned: Tuesday, April 19
Upload Due: 11:59pm, Monday, April 25
Print due: 10am, Tuesday, April 26
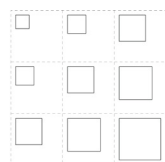
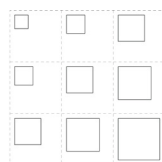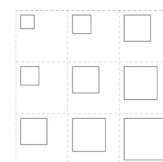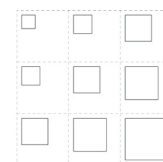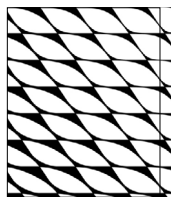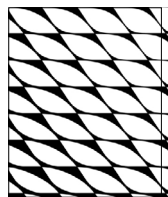*iteration 1*   *iteration 2*   *iteration 3*   *iteration 4*   *iteration 5*
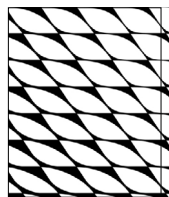
**Rectangle / Circle
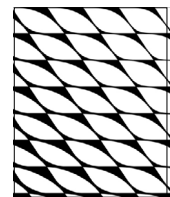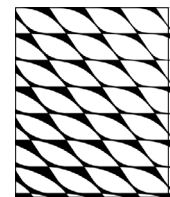Series**

iteration 1   *iteration 2*   *iteration 3*   *iteration 4*   *iteration 5*

**Rhino Curve, 3D or Points to Surface,
Series**