

OBD 210 A Spring 2024 [BLOG](#)

Previous student blogs:

- [210 2024](#)
- [210 2022](#)
- [Bryan Cera 210](#)

Blogs:

- [Lidia](#)
 - [Chiara](#)
 - [Avery](#)
 - [Cain](#)
 - [Dallas](#)
 - [Saskia](#)
 - [Elisha](#)
 - [Che](#)
 - [Farren](#)
-

Using Blogger

- [Intro to Blog](#)
- How to set up [Google blogger](#)

Rhino Installation

- [Installation download link](#)
- [Step by Step Instructions](#)

[Rhino Website Learning Resources](#)

May 7: Tutorial 1

Rhino Basics

- [Rhino 3D website](#)
- [Object types](#)

Mesh vs NURBS

- [Article](#)
- [Explained with simple geometries in Rhino](#)
- [Explained with complex geometries](#)

Project 1, Laser Cut

Curve and surface tools in Rhino

- [Surfaces from curves](#)
- [Planar srf](#) (making a surface from planar curves)
- [Hatch](#)
- [Boolean Difference](#) (trimming in 3D)
- [Laser engraving basics](#)

Laser cut geometries

- [Laser cut prep basics](#) (3D object, contouring for cut)
- [3D modeling simple lamp shade shapes](#)

- [Laser cut preparing a file basics](#)
- [Laser cutting \(3D modeling\)](#)
- [Preparing a box / shapes for laser cutting \(includes joinery\)](#)

May 14: Tutorial 2

Laser cutting File prep (optional background info/basics)

- [Cutting and overlapping layered artwork \(butterfly\)](#)
- [Examples of Laser Cut art \(includes round objects\)](#)
- [Laser Cut + Wood transfer](#)
- [Laser cut light box](#)

List of commands

- [Cube extrusion](#) the multiple ways to make an extrusion
- [loft \(rebuild\)](#)
- [Loft vase](#)
- extract wireframe
- [Wire structure](#)
- [Wire structure](#)
- points on
- trim
- [boolean difference \(joineries\)](#)
- [boolean union](#)
- [boolean split](#)
- array
- planar srf
- extrude crv
- extrude srf
- cap
- Scale
- sphere
- shell
- [contour](#)
- dup edge
- array polar
- Revolve

May 16: Tutorial 3

- [Srf from network of CRVS](#)
- [Extract wireframe](#)
- [Unroll SRF](#)
- Command: Text object
- Command: Record history

Laser cut project examples

- Lighting shapes
 - [3d shape](#)
 - [Simple joineries](#)
 - [Simple joineries and 3D shape](#)

- d. [3D to 2D explanation](#)
 - e. [2D cut outs making 3D shape](#)
 - f. [2D surfaces and 3D shape](#)
- Wood bending
 - a. [birch bending pattern](#)
 - b. [quilting/textile flexibility](#)
 - c. [Bending patterns](#)
 - d. [Wood bending surfaces make 3D object](#)
 - e. [hinge/bending template with measurements](#)
- Contour stacking a shape
 - a. [Vertical contours in 2D](#)
 - b. [Contouring in 2 directions](#) (similar to lighting)
- Object surfaces
 - a. [Object made of separate surfaces](#)
 - b. [More complex example with pattern cut outs](#)
- Stacked 2D imagery
 - a. [Stacked image](#)
 - b. [Using negative space](#)
 - c. [More complex](#)
- Building a box + laser cut joineries
 - a. [Finger joints](#)
 - b. [Slit joints](#)
 - c. [Sliding lid](#)
 - d. [Using wood bending for corners & lid](#)
 - e. [Wood bending corners + pattern engraving](#)
 - f. [Joineries](#)
 - g. [Joinery ideas](#) - could incorporate wooden dowels
 - h. [Dowels and sliding drawers](#)
- Laser cut jewelry
 - a. [Wood bending](#)
 - b. [Laser cut leather \(material\)](#)
 - c. [Custom, accurate, laser cut leather](#)
 - d. [Jewelry holder](#)
- Hanging object shapes
 - a. [Hanging shapes](#)
- Joineries
 - a. [3 way](#) (add surface with slits)
 - b. [Puzzle joinery \(box\)](#)

Project 2, 3D Modeling

May 21: Tutorial 4

- laser cut visualization
- [Rotating 3d in CAD](#)
- [Twist](#)
- [3D modeling basics](#). Video includes:
 - fillet/chamfer (table),

- uses mirror,
- layer locking,
- extrude crv (solid)
- Offsetting surface
- Sweep 2
- Revolve
- Contour
- [Revolve](#)
- [Extract isocurves](#)
- [Shape making video](#). Includes:
 - Rail revolve
 - Polar array
 - Rotate
 - Twist
 - Project
 - Split
 - Revolve
 - Polygon
 - Extract wireframe
 - pipe
 - Star
 - mirror
- [Ornamentation](#)
- [Shell](#)
- [Bend](#)
- spiral
- Project

May 23

Draw 3D models using 2D profile curves & how to texturize

- [Revolve & rail revolve](#)
- [Sweep 1](#)
- [Sweep 1 / Sweep 2](#)
- [Sweep 1 and sweep 2](#)
- [Drape](#)
- [Flow along srf](#)
- Live [Symmetry](#) (dolphin)
- [Symmetry](#)
- Sweep 1 to pipe [Interface, shapes, extrusions, panning](#)

May 28

- [Taper](#)
- [Cage Edit](#): to draw 3 dimensional organic shapes: face, fruit, etc. You can combine srf's using last week's tutorials, and then cage edit or rebuild to continue pushing and pulling.
- [How to use twist, taper, and cage edit](#)
- [Cage edit applied to 3D text object](#)
- [Extract isocurves](#), or [wireframe](#), rebuild / and pipe
- Draw wire frame using guidelines, [flow along srf onto sphere](#)
- [Gear](#)

- Curve boolean (dlt input all)
- fillet corners
- [Gear](#) with polar array circles
- [Screw](#) / threaded lid
 - Hexagon, fillet edge
 - Helix, pipe, boolean union
 - Nut: offset inside cylinder, offset larger thread (pipe),
- **PRODUCT MODELING EXAMPLES:**
 - [Hair dryer](#)
 - [Kettle](#) (reverse engineering round/symmetrical object)

May 30

3D Modeling:

- [Excellent, easy to follow 3D modeling videos pertaining to project 2](#)
- [Bottle](#) 3D modeling
 - Using sweep 2
 - Trim / cut w curved surface
 - Patch surface
 - Blend edge
- [Flip normals](#)
 - Properties
 - View
 - Display mode (shaded)
 - Backface settings (color)
- [Paneling tools](#)
 - Patterns
 - edges/faces (no)
 - [Soft move](#) (move in relation to radius)
 - Panel from 2D
- [Knob](#) texture

3D Printing File Prep

- [Prusa Settings for Thing Tank](#)
- [Prusa Website & Definitions](#)
- [Rhino to Prusa](#) file prep
- [More info on preparing Rhino file for 3D print](#)

June 4

Rendering:

- [Getting Started with render components](#)
- [Advanced detailing for render components](#)

Other Basic tools for rendering:

- Setting up your render [BASICS](#)
- Import & use custom [detailed materials \(like rust\)](#) from free download websites. Websites to download from include:
 - www.freepbr.com (download the entire zip .bl blender format)
 - www.polyhaven.com

June 11

Diagramming:

[Make 2D](#)

[Dimensions & annotations](#) (they are not compatible with make2d)

[Rhino layout annotations](#)