Week 2. Machines and processes

# Day 1: Vinyl cutter

First time setup (software force control in fab modules)

Loading and unloading materials

* Roll
* Piece
* Cover the Sensor
* Align the material

The test cut

* Remove the circle without removing the square
* Adjusting Force
* Adjusting blade length

Replacing the blade

Cleaning the blade

Replacing the white teflon

Installing vinyl printer in CUPS (compiled version)

* <http://localhost:631>
* Connect Roland Vinyl cutter through USB
* Add printer named **vinyl** (name is important)
* Make: RAW
* Model: RAW

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# Day 2: Laser Cutter

How a laser cutter works

* It cuts because it burns
* Lens focusing. Effects of unfocused lenses
* Kerf. Importance in design

Jobs

* Vector cutting
* Vector engraving
* Raster engraving

Settings

* Speed
* Power
* Frecuency

Security

* Danger of a Laser Class 4 beam
* Machine has built in protection
* Do not try to mess or hack the lid. It's not cool
* Fire
  + NEVER leave a laser cutter unattended. EVER
  + If you ever see an unattended laser machine working: SHUT IT DOWN
  + Check your design against double lines
  + Check your design against heat concentration (can the material handle it?)

Not laserable products:

* Vinyl
* PVC
* Any unknown material

Laserable things

* Anything specifically made to be laserable
* Acrylic
* Cardboard
* Wood
* Natural fibers and leather
* In general, all Natural materials

Laserable things that are not recommended

* The risk of Long term exposure to chemicals
* MDF

Anything laserable that you think it might contain traces of nasty things (glues, paints, coatings…)

# Day 3: 3D Printer

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# Day 4: Molding and Casting with Modela Milling Machine

## Molding and Casting

Designing sigle sided mold in antimony

* Forward design (start with the castable object) vs backwards design (start with the wax you have)
* Silicon clearance
* Wax clearance
* Advantages of antimony
* DESIGN FOR the tool you have or BUY A TOOL for the job you want to mill
* Inner corner limitation and design workaround
* Tool depth limitation
* Clearance parameter in fab modules (compiled version only)

## Roland Modela

Introductory video: <https://www.youtube.com/watch?v=jkLJI8L7TUs&feature=youtu.be>

First time computer setup. Changing the permissions on /ttyUSB0 **sudo chmod 666 /dev/ttyUSB0**

Mixing

Pay attention. By volume not necessarily equal to by weight!!!

Remember. Expensive material. Calculate silicon volume or weight and allow 25% extra

# Day 5: Shopbot

* Introductory video: <https://www.youtube.com/watch?v=aWh1C1wkhv4&feature=youtu.be>
* Join lines into polylines
* Nesting your design
* Toolpaths in Partworks (Vectric) software
  + Drill toolpath
  + Pocket toolpath
  + Cutout toolpath
    - Always interior cutouts firsts
    - Use tabs or drill holes to fix your parts
    - Beware: Interior, exterior or on the path