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

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

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