

# GSAPP FAB LAB 3D PRINTING

*policy, procedures, and pro tips*

## How do I 3D print?

1. Makerbot/Prusa: **bring** file to lab. Uprint/Form2: send file and **email** us.
2. Either prep your own file for DIY, or submit the file to the crew.
3. Pay before you print. **Keep your receipt attached** to the printer!

## How much does it cost?

1. **\$0.08 / gram** for Makerbot, **\$0.25 per meter** for Prusa
2. **\$0.25 / cm<sup>3</sup>** for Uprint **\$0.25 / mL** for Form 2

## What can I 3D print?

Well, a lot -- but not anything.

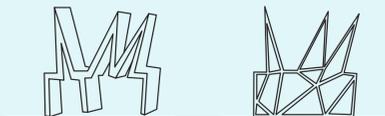
3D printing is analogous to any other construction method -- the less structural, solid, or simple your model is, the more difficult it will be. 3D printing geometry challenges generally fall into the following categories:

### 1. Overhangs and minima.



Prints are subject to gravity, and your prints need support for unsupported **overhangs**. On the filament printers, **small minima** are very difficult. If your model has sharp or thin spots that point downward, try to find a way to orient the model so those parts print upwards.

### 2. Small details and delicate parts.



Any "**shell thickness**" in your model should be at least 0.125 in (3mm) to print safely. "**Wires**" should be about the same. On the 24/7 printers, wires can be very unstable and lead to messy printing.

### 3. General complexity



The more **complex** your model, the more difficult it is to print, and especially more difficult to remove support material. If your model is really wonky, you might think of printing it on Uprint / Form 2.

## What 3D printer should I use?

Printer choice comes down to a combination of cost, quality, and complexity. Also, the Makerbot/Prusa printer are now operating on an "assisted self-service" model, allowing you to prepare files yourself.

### 1. Makerbot/Prusa

*I want to do it myself, I want to tinker with it.*

**Pros:** economical, easy, accessible

**Cons:** lower resolution, tough geom

**Bed size (x,y,z):** 24 cm x 15 cm x 15 cm

Prusa: 25 cm x 21 cm x 20 cm  
9.5 in x 8.25 in x 8 in

**Software:** Makerprint / PrusaControl

### 2. UPrint / Dimension

*My geom is tricky / I want you to do it for me.*

**Pros:** good for complex geometry, stronger plastic, dissolving support

**Cons:** material cost

**Bed size (x,y,z):** 20 cm x 20 cm x 15 cm  
8 in x 8 in x 6 in

**Software:** Catalyst (full service)

### 3. Form 2

*I need highest resolution and/or clear material.*

**Pros:** good for complex geometry, best detail/resolution, option for optically clear

**Cons:** cost, messy support, small bed

**Bed size (x,y,z):** 14 cm x 14 cm x 17 cm  
5.5 in x 5.5 in x 6.5 in

**Software:** Preform (full service)

## What else do I need to know?

- 3D printing software is on all Fab Lab computers!
- Makerbot/Prusa are available 24/7.
- Uprint / Form 2 are available to access 9A-10P
- All prints **must be paid before starting!** 24/7 too!
- All queues are managed by the Fab Lab crew
- If your print fails, notify the crew to troubleshoot.
- For special filaments, ask the crew.