

# 3d Printer Room Plans

The 3D Printer Room provides a place to house 3D printers and tools that is free from dust and provides access to multiple printers with a minimal of custom configuration.

## Mission Statement

### 3D Printing Should Be Easy.

1. We want **new users** to be able to follow a **very simple recipe** and be able to print right out of the box with **little or no training**.
2. For **intermediate users**, we want to **provide simple configurations that reliably print most objects with a preference for speed or quality**, with training provided to **communicate best practices** (how to orient a print for strength, etc).
3. For **advanced users**, we want to **provide enough documentation and flexibility so that they can experiment with settings** (that don't impact other users) so that they quickly find the "happy path" without spending their valuable time chasing down printing problems and wasted print time caused by tweaks with unintended consequences, with **information sharing along the lines of a guild**.
4. With the following attributes:
  - i. Comfortable: New users should find it easy to get started and not feel intimidated because they know they have enough to be successful at their level.
  - ii. Discoverable: When a user is ready to expand their knowledge, each step should be easily discovered and manageable.
  - iii. Stable: The printing environment should be stable, so that a returning user doesn't find themselves spending time figuring out what changed instead of printing.
  - iv. Available: At least one printer should be available for use at all times, with the user not having to change settings when they next walk into the printer room. When at all possible, all "workhorse" printers will be available.
  - v. Supported: Documentation and settings for print software for the workhorse printers is provided.
  - vi. Flexible: For example, users can hotplug a printer from the print server if they wish to print from USB.
  - vii. Simple: We don't want to do things that complicate unnecessarily. For example, billing for material used might sound like a good idea. But print speed and material costs actually make 3D printing quite inexpensive. A dehumidified cabinet, and an honor system of "replace filament with what you think we need most" would lead to a cabinet full of various filament colors and types that reflect what is actually needed. Another example: a print server adds management complexity. But it helps us simplify print settings across printers, and allows users to free up their laptop during a print and not risk killing a print accidentally. Both of these help users spend more time printing and less time configuring.

## Immediate Needs

- Dehumidified cabinet for filament storage (to help support filament "honor code" and avoid need for accounts and tracking). Lower priority is space, or a second cabinet, for "filament cubbies" (private filament storage).
- Dedicated set of tools and tool cabinet
- Print server (under construction)
- Settings for supported software for workhorse printers (for Cura)
- Laminated quick guides
- A very clear, self-starting, no-training-required path for getting started.
- Training (after workhorse printer configurations are stable and print server is operational)

## Filament

- Although the print server will be able to track usage by user, the current level of use hasn't warranted it.
- Filament left in the 3D printer room should be considered part of the commons and is available for use.
- Some users keep filament in their cubbies for use by themselves or their friends. Filament in private cubbies is not available for general use.
- There's an unwritten "honor system" where if you use filament, please bring in more. (To make this most effective, we need a low humidity filament storage area so that we can store a variety of colors and types for extended periods without fear of moisture contamination.)
- The low cost of material (\$19/kg at Microcenter) and "honor system" (use filament, buy filament) doesn't yet justify usage tracking. Class fees should also cover print material costs once classes commence.

## Printers

- "Workhorse" Printer: A "workhorse" printer has high availability requirements and stable configurations. Some training may be required.
  - Printbot Simple Metal (Makersmiths' owned)
- "Personal" Printer: Any 3D printer in the 3D printer room can be used by any Makersmith member. However, if a printer is marked "Personal" and the owner's contact information is provided, training must first be obtained from the owner before use.
  - Rostock MAX (Brad Hess). We're working on making this a workhorse printer. Check with Brad and Sean on status and with Brad on training.
  - Charlie's printer.
- All other printers: The goal is to get as many printers in "Workhorse" state as possible. Printers that aren't "Personal" or "Workhorse" printers can be used but aren't necessarily supported, working or even complete. If using one of these, and there is contact info on the printer, please reach out to see why the printer isn't a workhorse, and how you might help getting it closer (this counts as volunteer time.)

## Print Server

- Repetier Server is currently being configured on Ubuntu to act as a print server for all Workhorse printers. This work is ongoing, with the primary work remaining being to get two printers established as workhorse printers, and being able to reliably print from the print server or Cura standalone with common settings for speed or quality easily discoverable.