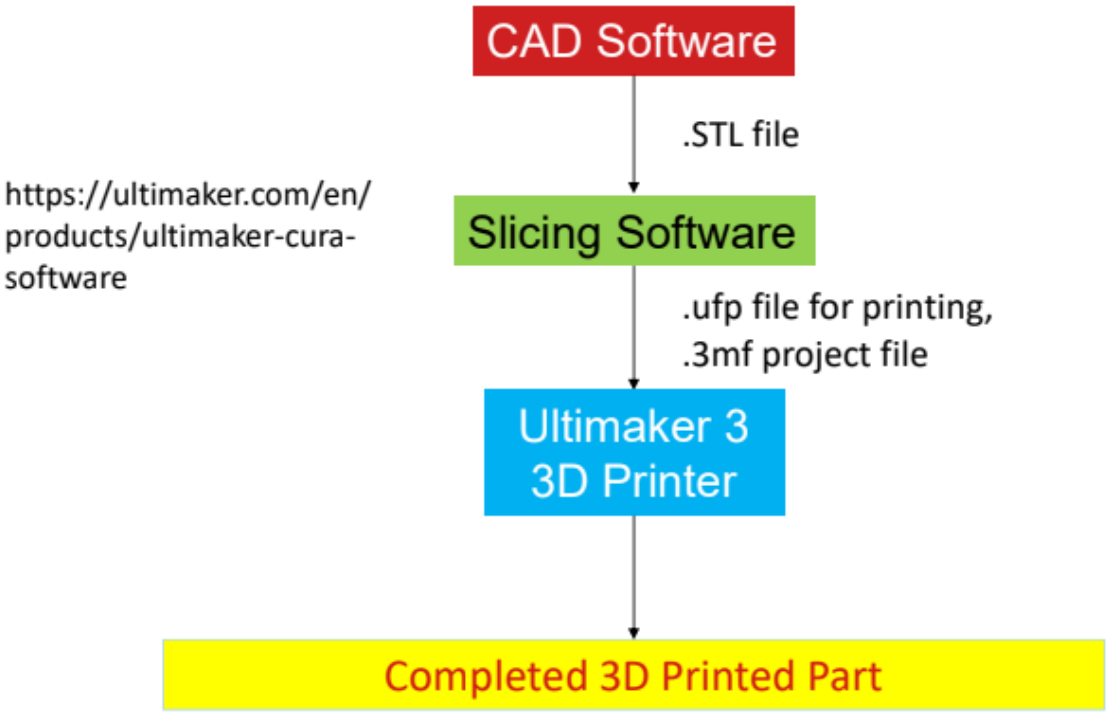
NJIT | Makerspace

Ultimaker 3 and Cura Quick Start Guide

Workflow



- Import STL to Cura
- Prepare print job
- Staff member approval
- Pay for 3D printing
- Start print job
- Job completion

Definitions

- Ultimaker Cura: slicing software (Cura)
- Ultimaker 3 (Printer)
- IPA: Isopropyl Alcohol
- STL: Stereolithography File
- PLA: Polylactic Acid (thermoplastic filament)

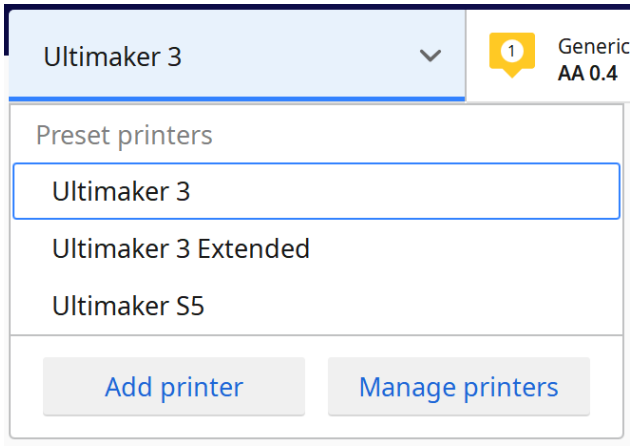
Supplies

- USB Flash Drive
- MatterHackers PLA or PETG filament
- Wire Cutter
- Hair Spray
- Spatula
- Paper towel

1 - Importing your model

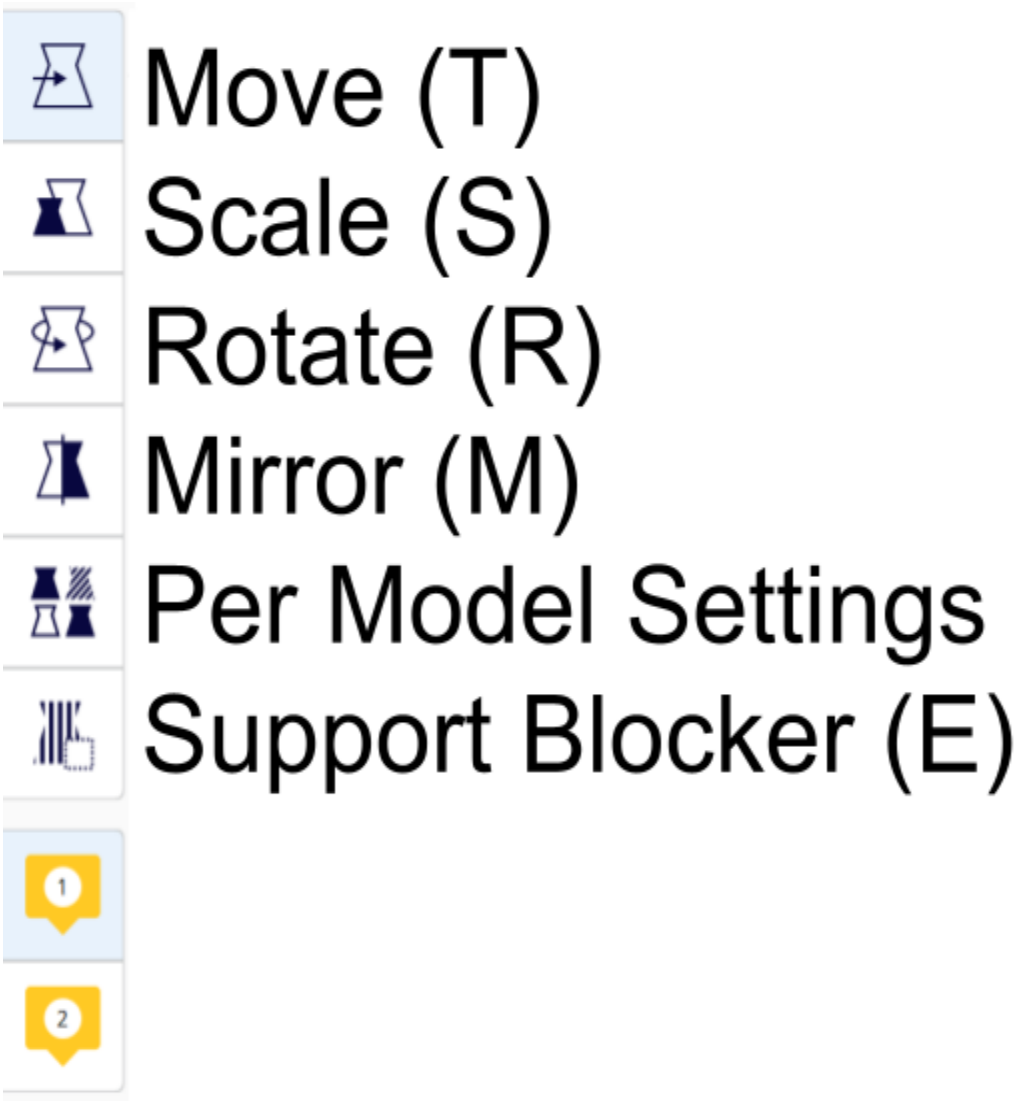
- Open Ultimaker Cura on the Makerspace desktop

- From the Menu Bar, select **the folder icon** and import your model(s) onto the Cura workspace
    - From your CAD software (Fusion360, SolidWorks, Creo, etc.), the model must be saved as an .STL, .OBJ, or .3MF file, otherwise it cannot be imported on to the Cura workspace
    - Multiple files can be opened and brought onto the work bed for efficient printing
- **Maker sure Ultimaker 3 is the selected printer.** Not Ultimaker S3!



2 - Preparing a Print

- **Use adjustment tools on the left hand side of the menu to manipulate a selected model**

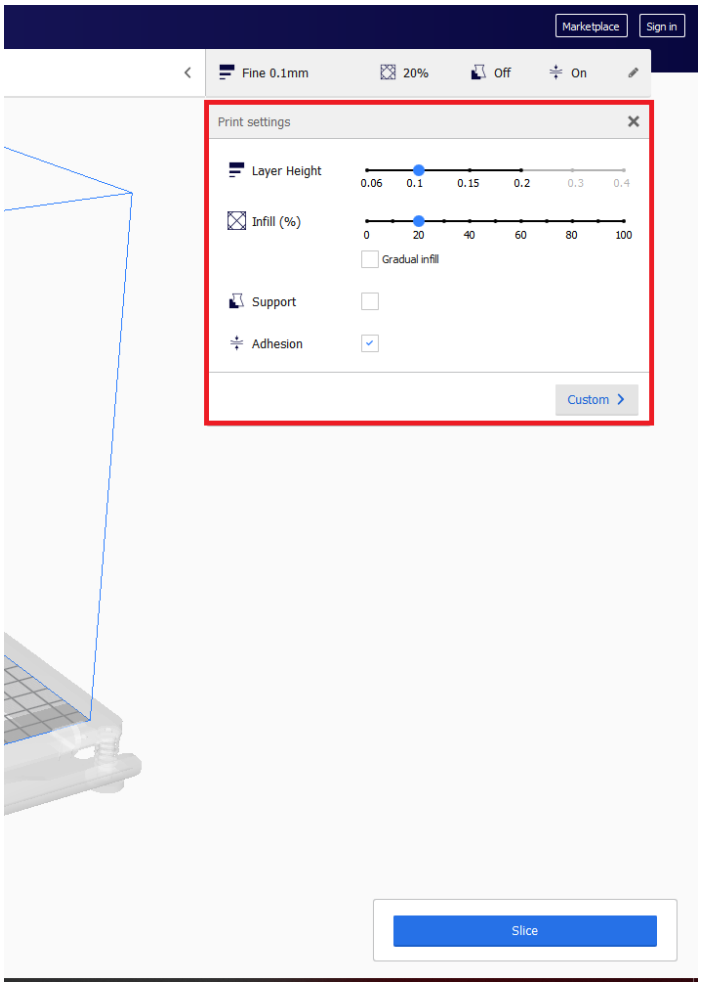


- **Move:** use the arrows to freely move the model around the work bed, or input values for more precision

- **Scale:** use the arrows to freely scale/change the size, or input values to define x,y, or z dimensions of the model
- **Rotate:** use the colored axis circles to rotate the model
    - Ensure that a flat face makes contact with the bed for optimal plate adhesion
    - *Changing the orientation of printing can alter the quality of plate adhesion, amount of support material used, and overall print time!!!*
- **Support Blocker:** Select areas where no supports should be. Use this feature only if support printing is enabled and certain regions should NOT have supports. Support blocked areas can be removed by clicking on the area again.

Print Setup

- For general printing, use the “Recommended” configuration options.
- Custom settings may be enabled to adjust other settings like layer height, wall thickness, extrusion speed, etc.



- Ensure “Extruder 1” is selected, Material is set to generic “PLA” or “CPE”, and Print Core is set to “AA 0.4”.
- **Layer Height:** Use 0.2mm for general printing. Use 0.15mm or 0.1mm if finer layer resolution is required
- **Infill:** 15-20% for general printing.
- **Generate Support:** IF REQUIRED, enable.
- Seek assistance from Makerspace staff if you are uncertain about the need for support.
- In the Prepare tab of the virtual workspace, Cura will highlight surfaces that may need supports in red
- **Build Plate Adhesion**: Enable

- Click “Slice” at the bottom right corner of the window to slice the current print job and see the estimated print time and weight.

3 - 3D Printing Router Card and Form

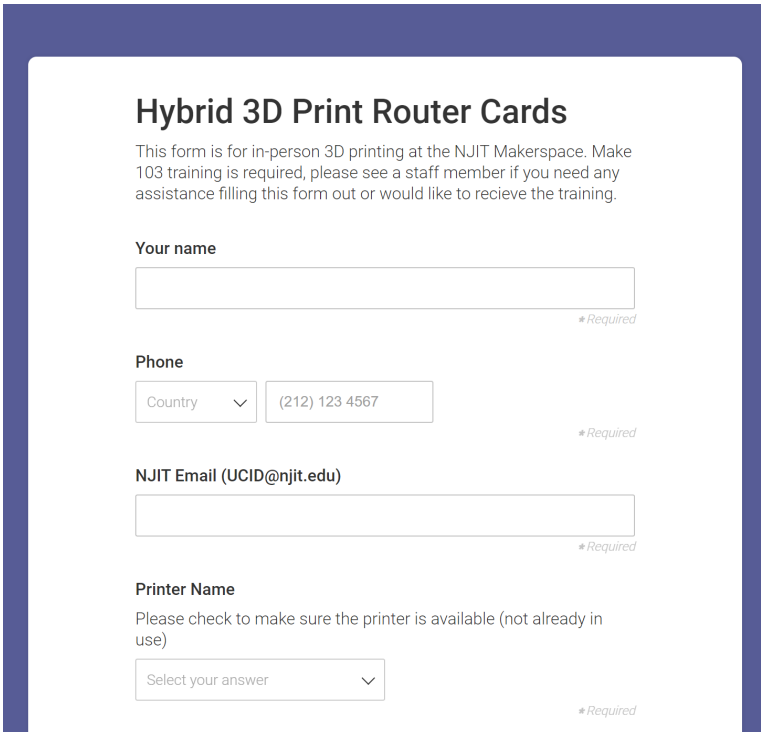
Physical Router Card

- **Maker Information:** Fill in your first name, last name, NJIT email address, and phone number. The Start Code will be provided by a staff member once you have paid. Write clearly so the information is readable!

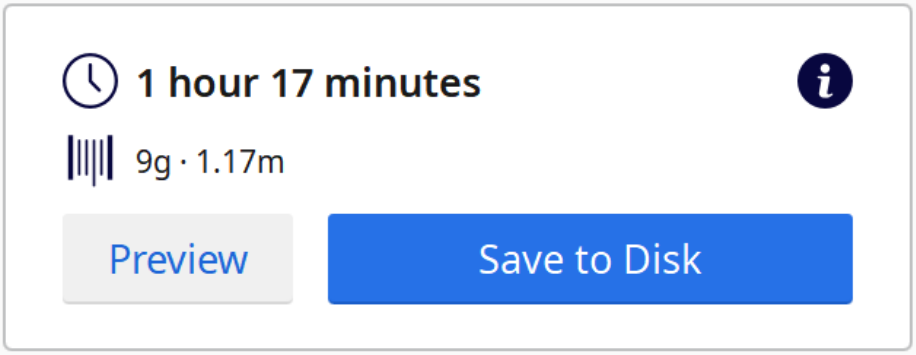
NJIT | Makerspace 3D Printing

Maker Information	
First Name	
Last Name	
UCID@njit.edu	
Phone Number	
Start Code (Staff)	

Web Form



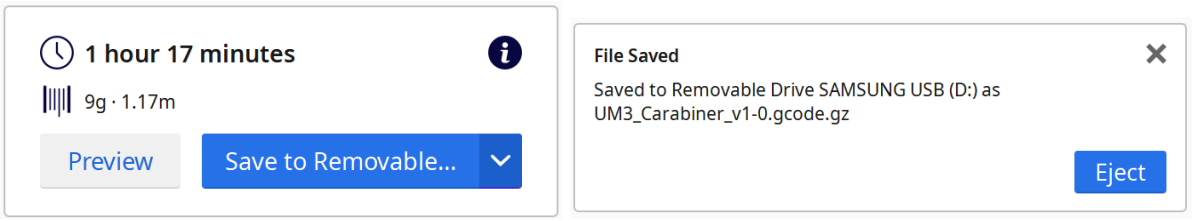
- **Enter your personal information again here** (Name, email, and phone number). Make sure the information matches what you have put on the physical card and that you are reachable at the phone number provided.
- The rest of this form collects information regarding your print job. **Please make sure the information you are entering is accurate!**
    - **Choose a 3D printer**. Make sure the printer is available (not in use) and that there is enough material on the printer, if the machine runs out of filament you will not be eligible for a reprint. If you are worried that there might not be enough filament left you can ask a staff member. If a completed print is sitting on the machine you can alert a staff member who will remove it.



    - **Enter the weight of the print (grams).** In the image above the weight is 9g.
    - **Enter the total number of print hours.** This is just the number of hours, ignore the remaining minutes for this step. In the image above the total number of print hours is 1.
    - **Enter the remaining minutes.** This is just the minutes, in the image above the remaining minutes are 17 minutes.
- **Submit the form. Find a staff member and present them with your physical card and let them know you would like to start a print.** The staff member will

check your sliced file then charge you for your print, update our online system, add the start code to your physical card, and give you a USB Flash Drive.

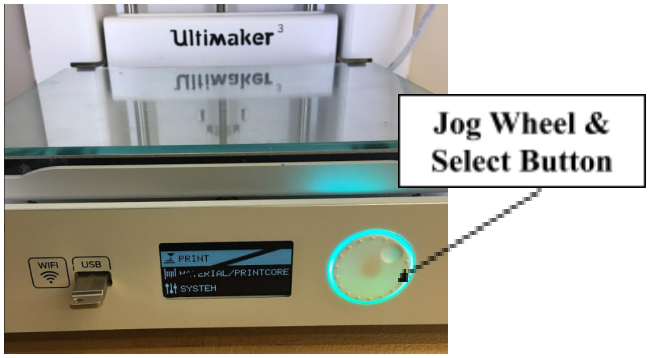
- Plug the USB Flash Drive into your computer, Cura will automatically recognize the USB and the “Save to disk” button will change to “Save to Removable Drive” as shown below. **Click this blue button to save the file**. A new notification will appear at the bottom center of the screen after a few seconds, click the **Eject** button to safely remove the USB.



4 - Start a Print

- **Ensure the build plate is clean.**
  - Use a small amount of isopropyl alcohol (IPA) and a blue towel sheet to wipe the entire build plate surface. Towel is reusable so please do not discard unless ripped or unclean.
- **Apply hair spray for build adhesion.**
  - Quickly spray a very light layer of hair spray on the glass build plate where the part will print.
- **Place staff approved (paid) NJIT Makerspace 3D Printing Information Card in card holder.**

- **Insert USB Flash Drive and start your print.**



  - Using the Select Button, select Print and choose your file to start print. By default Ultimaker will recognize the latest file saved to the USB drive.
- **Ensure the first layer is printed successfully before walking away!!** Free reprints upon failure will not be given if this is not followed.

5 - Remove your print

- **Wait for the glass bed to cool.** The 3D printed part(s) are easy to remove when the bed is near ambient temperature. If the bed is cool, the part can likely be removed without the use of any tools. It is not recommended to attempt to remove the part until the bed cools below 45 ℃.
- **Use a spatula.** Gently wiggle the spatula under the print back and forth until the base of the print is released.
- **Clean the glass bed.** Remove any excess plastic and hair spray with the spatula and/or IPA
- **Sign the physical router card and bring it to the front desk or a staff member.**
- Return the provided USB Flash Drive to the staff member.
- If Ultimaker printer maintenance or repair is necessary, or if a spool of filament needs to be replaced, please contact NJIT Makerspace Staff for assistance!

Table 1: Ultimaker 3 - Self Serve Stations Maintenance - STAFF		
What	**How**	**When**
Material	Check back of the printer and ensure material is loaded. Repeat for all printers.	Start of Day
Build Plate	Ensure material or hair spray is not accumulated on build plate	Start of Day
Supplies	Ensure table supplies are not missing. Check both tables.	End of Day
Ultimaker	Overall Functionality	End of Week

Rev.	Description	Edited By	Approved By	Date
A	Initial Release	R. BURGHART	J. SURIANO	12/10/2018
B	Edited	K. MACARO	J. SURIANO	07/24/2019
C	Edited	A. STEINMARK	J. SURIANO	6/3/2021