

3D Printing; Makerbot (FDM), Ultimaker, Powder (Z650)
3D printing policy revision

Starting Fall 2016

Students using any of the 3D printing (3DP) machines will encounter new rules for submission and operation of the fabrication LAB.



3D PRINTING POLICY PROCEDURE;

1. Student Submit Files

- i. Complete submission form
<http://www.nycctfab.com/#!3d-printing-submission-form/wua1s>
 - ii. After form is submitted, upload model to the 3D Printing _ File Submission
<https://www.dropbox.com/request/bqpBfqvkhGn5KVAz8Gy1>
 - iii. **Submission Accepted**
Student receives message via dropbox, that file is accepted.
 - Submission Revision**
Student schedule meeting time with 3DP CLT, to review file.
http://www.supersaas.com/schedule/NYCCTfab/3D_Printing
- **CLT submits file.**
(*Name files using the following convention: **yyyymmdd_material type (plastic or powder)_professorsurname_studentsurname_n**, n being a number in the event that you are printing multiple parts that day.)

NOTE: REVISIONS should not be more that 30 minutes per student.

Makerbot Training

1. Students will make **60 minute appointments** on appointed hours and days (**Note during fall 2016, Makerbot training will be Thursdays from 2-5 PM**)
 - A. The training will cover:
 - i. Proper mesh set-up and discussion of the process and science of "3D printing"
 - ii. An intensive look at proper care, set-up and running of the 3D printers
 - iii. Troubleshooting errors/ equipment malfunction
 - iv. Properly loading filament
 - v. Properly leveling build plates
 - vi. Variety of materials options for each printer
 - vii. Post production for prints
 - B. After training, students are required to take a short quiz to determine whether or not they shall have access to the makerbots

Before/During FDM Printing:



1. Students are expected to follow the modeling, plate leveling, and filament procedures shown during training.
2. Prints will be sent via USB drive.
3. Prints will not be sent after monitors are off duty.

See the <http://www.nycctfab.com/#!3d-printer-monitor-schedule/c1qvj> for monitor schedule.

FDM printing After completing prints, students are required:

1. Students are required to clean up all remaining materials left inside or near the printer.
2. Make sure the build plate is clean, if any issues occur (such as: material getting stuck on the build plate which can't be removed) please ask for the assistance of a 3DP CLT on duty.
3. All filament must be unloaded from the extruder after printing to prevent the extruder from clogging
4. Failing to do so can take away the benefits of using the machine

Approval for Makerbot use:

1. An "approved student" list (google drive) will exist for students that have undergone training
2. Prints **cannot** be sent out when the assigned CLT is off duty, but can continue printing after CLT has left. (However limited to any overnight prints. **With the exception of Ultimaker 2**)
3. Students will release prints via USB connection
4. Prints will run in the order they appear on the queue
5. Students must take training for the makerbot at the beginning of each semester

***Please note that During MIDTERMS and FINALS all FDM printers are solely operated by the CLTS on duty. There are no training times available for the Makerbots during Midterms and Finals.**

Filament Use:

C. Student must purchase their own filament: Makerbot 1.75mm, Lulzbot 3MM

Trusted vendors include but are not limited to:

1. Desired brands for makerbot 2 and 2x:

Makerbot (<https://store.makerbot.com/filament>)

** Available At home depot, Makerbot Store NYC, Micro Center*

Dremel (<http://www.homedepot.com/s/filament?NCNI-5>)

** Available at Home Depot*

Faberdashery (<http://www.faberdashery.co.uk>)

Esun (http://www.gudteks.com/3D_Printer_PLA_Filament.html)

Color Fabb (<http://colorfabb.com/pla-pha>)

** Only Available online*

2. Desired brands for LulzBot

LulzBot PLA (<https://www.lulzbot.com/catalog/pla>)

Faberdashery (<http://www.faberdashery.co.uk>)

Esun (http://www.gudteks.com/3D_Printer_PLA_Filament.html)

***If still unsure, prior to purchasing filament- student should confirm with a CLT to make sure he/she is purchasing the correct filament size and/or brand.**

Ultimaker

***We have added 2 Ultimakers to our 3DP facility**

- D. Ultimakers are solely to be operated by a trained CLT, Students who need assistance with the printer must request assistance from the CLT on duty.
- i. Any students wishing to release prints must consult with a 3DP CLT on duty, and must create submission with that CLT.
 - ii. Students are required to purchase filament from the required vendor typical filament size is of 2.73 mm

1. Materials for the Ultimaker can be purchased from the following vendors

Dynamism (<http://www.dynamism.com/3d-printers/ultimaker-2-plus/filament-pla.shtml?APC=P870>)

3D universe (<http://shop3duniverse.com/products/official-ultimaker-pla-filament-2-85mm-2-lb>)

Matter Hackers(<http://www.matterhackers.com/store/3d-printer-filament?t=Ultimaker%20PLA&?rcode=ULTICOM>)

Z650 Powder Based prints

- E. Prints released on the machines require a longer period of time and detailed model preparation, therefore releasing of these prints requires the following;
- i. **Project Request** is to be submitted by your professor at <http://www.nycctfab.com/>; Under nycct faculty (click request a project).
* All projects are to be approved under the discretion of the departmental 3D Printing Coordinators / Leads.
 - ii. Students are required to schedule appointments with CLT on duty to revise models (Appointments can be scheduled under the same for as the Makerbots, and Ultimakers; see the provided link
<http://www.supersaas.com/schedule/login/NYCCTfab/>
 - iii. Model revision appointments should not last more than 30 minutes. (If your model requires more time you **must schedule a second appointment on the next following day, it is your job as a student to try to resolve issues with your model prior to seeing a CLT and if any issues are unresolved after an appointment.**
 - iv. Students are only permitted 15 cubic inches of powder per semester, however more may be supplied depending on the complexity of the model (3DP coordinators or leads will decide on their discretion)
 - v. All prints should not be less than 1/16" thickness; a good range for thickness is ¼" - 1/16"
 - vi. **All models should be modeled in Inches, small details such as Stairs, Mullions & handrails are unnecessary. As they are unlikely to survive during the extraction process for their size, and fragility.**
 - vii. CLT must submit files, and make sure the fabrication Coordinators or leads have approved the projects. Be sure files are named in the following manner
(*Name your files using the following convention: *yyyymmdd_material type (resin or powder) _professorsurname_studentsurname_n*, n being a number in the event that you are printing multiple parts that day.

Example; (20160519_Resin_Vidich_Espinal_1, 20160519_Resin_Vidich_Espinal_2)

***Important, Professors are required to request 3D printing workshops with CLT weeks in advanced prior to project submission deadlines.**

***Please be Advised, all models should be revised one week prior before to midterm and finals weeks. Failing to do so will result in your inability to print.**

***Professors|Students|and CLT's**

There are NO Class Group submissions. Professors are not allowed to send any CLT a collective folder with projects. All students must submit their projects individually.

***We try our best to ensure all of our machines are fully operational during the semester; however there are instances in which our machines have failed during the important dates, if so**

- i. Professors are required to choose the top models of their class, under their discretion.
- ii. Immediate notification to students.
- iii. Models must be downsized for faster print time.

Archiving Images:

- F. All works should be photographed by students and should be submitted to CLT for proper archiving. There is a dedicated folder that should be named with under the semester, followed by sub folders with the class and professors) these images should then be archived in the dropbox account.
- G. For Presentation purposes we will select a few models from every class (Z650 Prints) and hold them within school remises for up to a year. Students may take other models once they have been properly archived. This will happen 1-2 weeks after presentation dates. Students who do not photograph their models will lose the ability to keep their models, as well as privileges to 3D printing.