

OBJET 3D Printing Overview

ELEC391

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Introduction

In addition to the Tinkerine DITTO PRO 3D printers, ELEC 391 students can also 3D print parts using the OBJET24 and OBJET30 3D printers available in the Lightning Lab, in MCLD 257. Undergraduate students can submit parts to be printed in the Lightning Lab, however undergrads cannot be granted full access to the lab or the Objet printers.



This tutorial will give an overview of the Objet printers available in the Lightning Lab, including an explanation of the different technologies utilized in the Objet printers and the Tinkerine printers. The Tinkerine printers utilize FDM (fused deposition modelling) technology while the Objet printers operate using PolyJet SLA (stereolithography) technology.

Undergraduate students are not able to access the Lightning Lab to print parts on their own, but they may submit a job to be printed. This tutorial will include a step-by-step guide on how to submit parts to be printed with the Objet printers.

FDM vs PolyJet (SLA)

The OBJET printers are different than the Tinkerine printers several different ways. They both use different 3D printing technology, and vary in price and functionality.

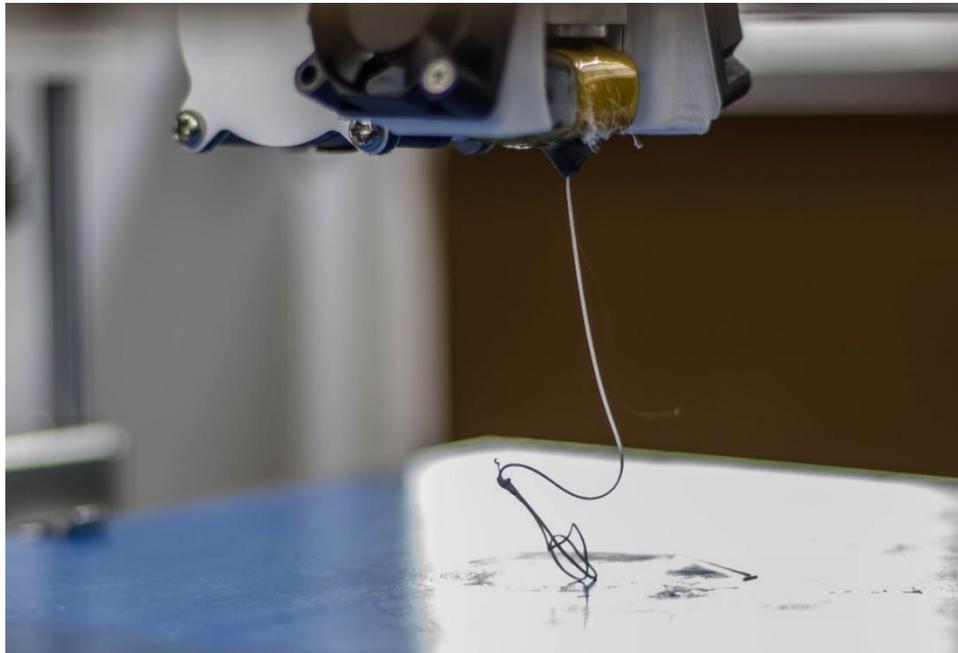


FDM (Fused Deposition Modelling)



SLA (Stereolithography)

The Tinkerine DITTO PRO 3D printers use FDM (fused deposition modeling) technology. FDM technology works by depositing material layer-by-layer to create a 3D object. Usually the material is a PLA plastic that is melted by the printing head, extruded as a thin stream of melted material, and then dried to form a solid layer. These layers are deposited one-by-one until a full 3-dimensional solid shape is formed.



The Objet24 and Objet30 printers use PolyJet technology, which is a type of SLA (stereolithography) technology. This type of 3D printing technology utilizes the same principles as an inkjet printer. The PolyJet printing head is made up of many tiny holes, which deposit liquid photopolymer in layers. Once a layer of the liquid photopolymer is deposited, a UV light is passed over the liquid layer, immediately curing the liquid into a solid layer. The process is repeated, a layer is deposited, then cured, over and over again until a solid object is formed. This process takes place entirely inside the housing of the printer. Unlike the Tinkerine printers, the printing happens in a closed environment.



These two 3D printing technologies are fundamentally different and as such, they are both different in terms of material used, cost, functionality, etc. The Tinkerine DITTO PRO 3D printer has a lower absolute resolution, is much cheaper (both the cost of the printer and the build material), and can print parts much quicker. The Objet printers are able to achieve much higher precision and resolution, but cost considerably more and are also much slower in printing parts.

| TINKERINE DITTO PRO | OBJET24/OBJET30 |
|--|--|
| <ul style="list-style-type: none"> - FDM technology - Lower resolution - Lower cost - Faster print times - Economical - For general purpose/prototyping/hobbyist use | <ul style="list-style-type: none"> - PolyJet SLA technology - Higher resolution - Higher cost - Larger footprint - Slower print times - For industrial/research applications |

In general, the Tinkerine printers are more appropriate for undergraduate projects, basic prototyping and for hobbyist/enthusiast use. The Objet printers, on the other hand, are more appropriate for graduate research work and industrial applications.

For most students in ELEC 391, the Tinkerine DITTO PRO 3D printers make more economical sense. However, there may be some situations where students would like to print parts that are less feasible using FDM technology and better suited for PolyJet printers. In these cases, students can submit a job to be printed by the Lightning Lab.

Submitting a Job for the OBJET Printers

Students in ELEC 391 and other undergraduate project courses can submit jobs to be printed using the Objet printers in the Lightning Lab. Once the job has been submitted, the part will typically be ready for pickup in 2 business days.

To submit a job, first navigate to the 3D printing section of the ECE Engineering Services website, available at the following url:

<http://eng-services.ece.ubc.ca/fabrication/3d-printing/>

Next, select “Request 3D Printing – Undergraduate Students” on the panel on the left side of the page.

This link will take you to an online form which must be filled out to submit a print job. Fill in all the fields as accurately as possible.

Project Fabrication

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| 3D Printing | ^ |
| Request 3D Printing - Undergraduate Students | > |
| Request 3D Printing - Researchers | > |
| Electrical Fabrication | v |
| Mechanical Fabrication | v |

Request 3D Printing – Undergraduate Students

Please use the form below to submit a request for 3D printing. Typically, the parts you requested should be ready for pickup within 2 business days. Once ready, you will be notified.

3D Order - Undergraduate Students

Please use this form if you requesting 3D printing for an ECE undergraduate course, including capstone.

Name *

First Last

Email *

Requestor Type *

Please indicate whether this request is for capstone, or another ECE undergraduate course.

Please enter your course number *

0 of 9 max characters

Please enter your group number *

0 of 9 max characters

After the order form there is a section to fill out 3D printing information. Here you can select FDM or PolyJet (FDM refers to the Tinkerine printer while PolyJet refers to the Objet printer). Also submit your .g or .stl file here and any additional comments that may be necessary.

Printing Type *

FDM ▼

File *

Drop files here or

Select files

Accepted file types: stl, obj, g, objf.

File Units *

mm ▼

Additional comments: *

0 of 300 max characters

Please indicated the quantity of each part included as an attached file.

Submit

After the file has been submitted, it should be ready for pickup within 2 business days. Be sure to frequently check your email as the part may be ready earlier or later than the usual time.