Ultimaker FDM 3D Printers (plastic)

Information on 3D Printing with the Ultimakers in the 3D Workshop.

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What are the Ultimaker 3D Printers?

In the 3D Workshop the are six Ultimaker 3D Printers for student use.

Ultimaker is a brand of 3D Printer which uses a technique known as **Fused Deposition Modelling** (FDM) or **Fused Filament Fabrication** (FFF). This technique uses a string of thermoplastic material (filament) which is pushed through a heated nozzle. The printer lays down melted material at a precise location, which then cools and solidifies, building the print layer-by-layer.

In order to print, you will need an 3D model in the .stl file format. Free models are available online - **Thingiverse** is a particularly good source. It is also possible to **3D scan** existing objects. 3D modelling support is available at **The Digital Space**. Once you have your .stl you will need to run it through a program called **Cura**. This a a free software. See our cura guides for **set up** and **use**.

Here are some videos links of the Ultmaker printers in action:

How does 3D printing work?

Printing time-lapse Video on the Ultimaker 2

Ultimaker 3D printing with PVA water soluble support on the Ultimaker 3

Which printer should I use?

The 3D workshop has 2 different models of Ultimaker 3D Printers:

- Ultimaker 3
- Ultimaker S5

The **Ultimaker 3** and **Ultimaker S5** have 2 print heads. One head prints PLA plastic. The other head prints support material. The support material supports any overhanging areas while the hot plastic solidifies. This stops any drooping e.g. you would want support under the chin of a person if printing a bust. After printing, the support material can be broken off by hand or with pliers. Some sanding may be needed. For very complex geometries, technicians may instead recommend a dissolvable support material.

The maximum print size of the Ultimaker 3 is **169 x 170 x 198mm**.

The **Ultimaker S5** is the larger of the two printer models. The maximum print size of this machine is **308 x 218 x 298mm**. The larger print size means longer print times - often over 24 hours.. The longer a print runs the more likely it is to fail. Any print over 48 hours has a higher chance of either failing. Set up your file in **Cura** to find out the print time before booking your printer. For prints of over 24 hours, book on a Friday so that you have the printer over the weekend.

Only book the **Ultimaker S5** if you need it for large prints.

How do I book the Ultimaker Printers?

https://indd.adobe.com/view/b16754d2-de69-4aba-a37d-bd2cafe0164c

What materials are available for the Ultimaker 3D Printers?

PLA.jpg Image not found or type unknown We have a range of filaments and colours you can print with. We primarily print with PLA (Polylactic Acid) a fully biodegradable thermoplastic polymer consisting of renewable raw materials. Colours currently available are

- Black
- White
- Silver
- Pearl White
- Magenta
- Red
- Green
- Blue
- Orange
- Yellow

There are also some specialist materials available such as Flexible Plastic, Clear, Wood and ABS. Please contact the workshop to discuss these mateials.

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How much does it cost and how can I pay?

We charge a small fee to cover the cost of materials. PLA costs 43p per meter of material used. Cura can determine the price of the print for you. See how to **set up Cura for the first time**

The cost of the print depends on the level of detail and the size of the model. Generally speaking a bust model, 80mm tall with a good level of detail would cost between £1.50 and £2.00.

A technician will email you once your print is completed with a payment link to the **Estore**. You will need to pay before collection and show your payment confirmation email to techinicians. Simply add the amount sent in your email into 'Amount', then 'Add to Basket' and 'Proceed to Checkout'. It will ask you to Register if it's your first time using the EStore (you can always checkout as a guest if you are having problems).

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Setting up Cura and Preparing Files for Printing

Setting up Cura and Preparing Files for Printing

Ultimaker 3 and S5

Download and follow the **Guide: Setting up Files in Cura for Ultimaker FDM plastic 3D Printers** and follow all the steps. If you find anything confusing, come into the 3D Workshop and see a technician in the 3D Print room.

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Using the 3D Printers

Printing

Ultimaker 3 and 3 Extended: How to Print

You will do this supported by a technician in the workshop. The video is just here if you are interested in seeing the process beforehand.

https://www.youtube.com/embed/6dV7Q4fHe68

Changing Filament

Ultimaker 3 and 3 Extended: How to change filament

https://www.youtube.com/embed/oFI8vGPQaXM

Ultimaker Useful Resources

The guides below cover a range of print/design considerations in detail.

Designing for FDM 3D Printing

3D Verkstan have produced a useful guide on **designing for 3d printing** which is worth reading to get the most out of the Ultimaker 3D printers.

Getting Better Prints

There is also a useful guide on **how to get better prints**.

Print Finishing

There's lots of useful information on the **Ultimaker website**.

Make have created a guide on **finishing and post-processing 3D printed objects** which covers friction-welding, rivetting, sanding and painting.

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