

Introduction to 3D-printing

About us

- Volunteer student organization
- Manages Makerverkstedet in U1
- Arranges courses and events
- Works to create a better relationship
between student workshops

MAKE NTNU

Makerverstedet U1



Open 24/7

Staffed weekdays
between 12-18

Facebook user group for Makerworkshop U1



Makerverkstedet U1

Offentlig gruppe

 Samhandler som MAKE NTNU

[Om](#)
[Diskusjon](#)
[Medlemmer](#)
[Arrangementer](#)
[Bilder](#)
[Moderer gruppe](#)

Søk i denne gruppen 



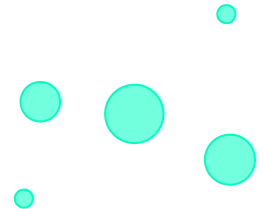
Er medlem ▼

 Varsler

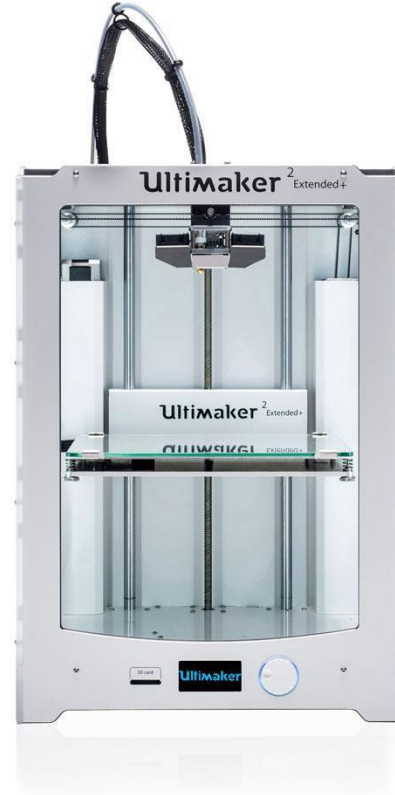
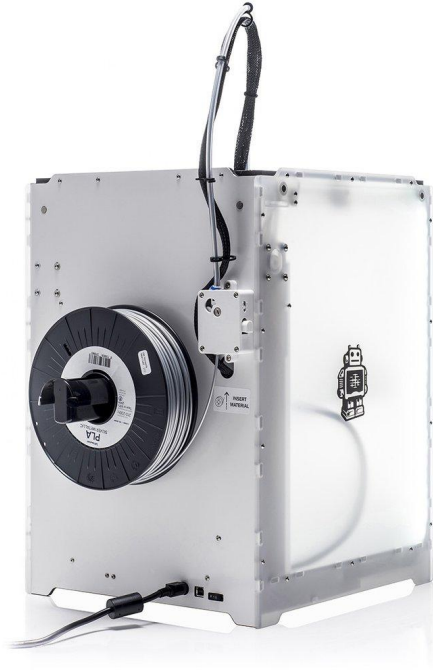
 Del

... Mer

- Components of a printer
- From idea to object:
 - Model
 - Slicer
 - Printer
- Surface treatment
- Different types of materials
- Types of printers
- Reserve a printer
- Rules
- Where can you print
- Practical demonstration



Components of a printer



From idea to object

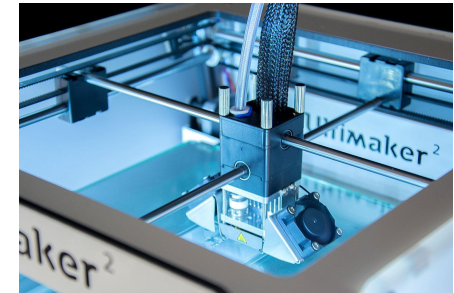
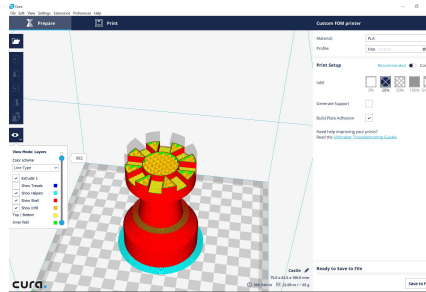
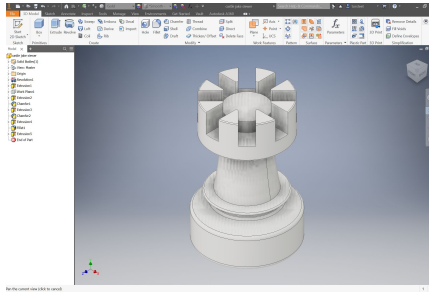
3D-model

.stl

Slicer

.gcode

Printer



- Design it yourself

- SketchUp
- Fusion 360(MAKE NTNU has an intro course)
- Solidworks
- 3DS Max
- Blender
- Maya
- etc

- Find online

- Thingiverse
- Terrafab.bengler.no
- Shapeways
- Sketchfab
- GrabCAD

3D-Model

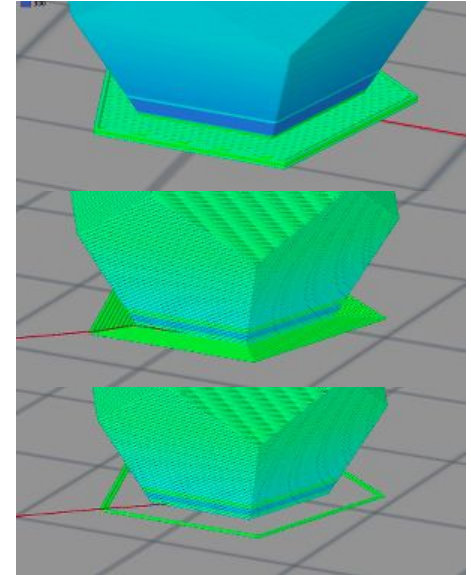


Slicer



Printer

- Slices the object into layers and generates gcode
- Adjust the settings for your print
 - Resolution
 - Infill
 - Support
 - Raft, brim, skirt



3D-Model

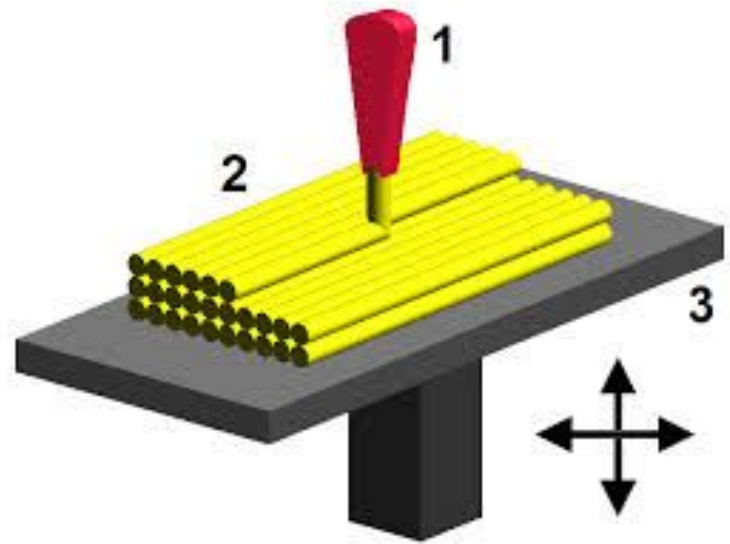
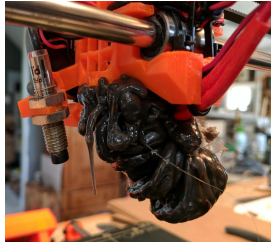
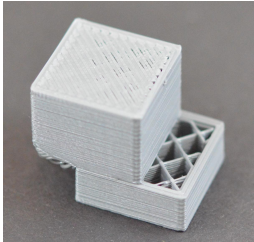
.stl

Slicer

.gcode

Printer

- Executes the gcode instructions
- No error detection
- More in the demo



3D-Model

.stl

Slicer

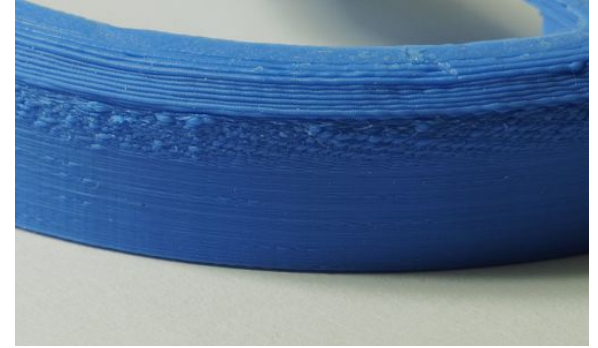
.gcode

Printer

- PLA
 - Most common
 - Easy to print
 - Organic
 - Deforms
 - "Food safe"
- ABS
 - More durable
 - Toxic
 - Challenging to print correctly
- Sizes
 - 1.75 mm
 - 2.85 mm
 - 3 mm
- "Exotic" materials
 - Glow in the dark PLA
 - Flexible materials
 - Composite materials
 - Carbon fiber
 - Metals
 - Woods

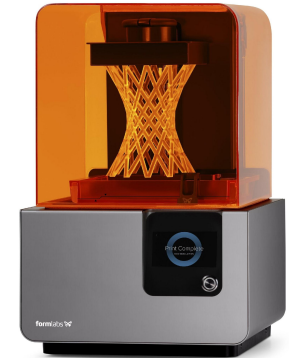


- Remove supports and defects with a knife
- Polish with sandpaper / Dremel tool
- Chemical treatment



Types of printers

- Most common
 - Fused deposition modeling (FDM/FFF)
 - Stereolithography (SLA)
- Industrial printers
 - Digital Light Processing (DLP)
 - Selective Laser Sintering (SLS)
 - Selective Laser Melting (SLM)
 - Electronic Beam Melting (EBM)
 - Laminated Object Manufacturing (LOM)
 - Binder Jetting (BJ)
 - Material Jetting (MJ)



- Cures liquid resin with lasers
- Pros:
 - Extremely high resolution
 - Large selection of materials
- Cons:
 - Expensive
 - Less user friendly



Reserve a printer

1. Login
 - Login through Feide
2. Reservations
3. Find a printer
4. New reservations
5. Choose time period

The screenshot shows the MAKE NTNU website interface. At the top is a dark navigation bar with the MAKE NTNU logo and links for Home, Events, Articles, Makerverkstedet, Reservations, a user profile icon, and Norsk. Below the navigation bar, the 'Machines' section is displayed. It includes a blue button for 'My reservations' and the heading '3D-printers'. A link for '(Rules)' is also present. Three printer cards are shown, each with a placeholder image of four grey bars arranged in a square. The first card is for 'Einstein', the second for 'Tesla', and the third for 'Curie'. Each card indicates the printer is 'Reserved' (in blue text) and lists the model 'Ultimaker 2+ Extended' and the location 'Printerrommet' with a blue arrow icon. At the bottom of each card is a blue button labeled 'View in calendar'.

MAKE NTNU

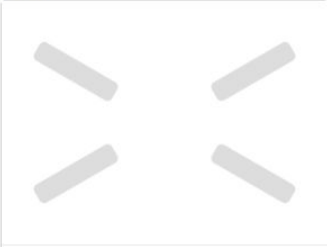
Home Events Articles Makerverkstedet Reservations Norsk

Machines

[My reservations](#)

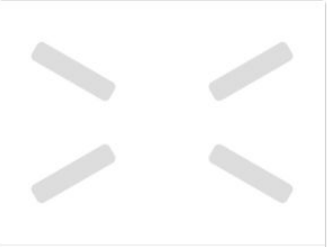
3D-printers

[\(Rules\)](#)



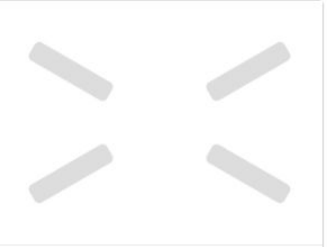
Einstein
Reserved
Ultimaker 2+ Extended
Printerrommet

[View in calendar](#)



Tesla
Reserved
Ultimaker 2+ Extended
Printerrommet

[View in calendar](#)



Curie
Reserved
Ultimaker 2+
Printerrommet


[View in calendar](#)

IMPORTANT:

- Feide-account in **CAPITAL LETTERS**
- NTNU studentcard: EM-number



- Free
 - Not for profit
- The printers are only for those who have attended the course
- Clean up after yourself
- You are responsible for whomever you bring with you into the room
- No food or drinks inside the printing room
- Follow the guidelines on the website
- If anything is wrong with the printers, contact MAKE NTNU
- Respect the calendar




3Dprint@makentnu.no
makentnu.slack.com

Guidelines for Unattended 3D-Printing



- All unattended 3D-Printing has to be booked in the calendar
- The printer has to be marked with name and phone number
- The print's file-name has to start with your NTNU username
- You have to be present the first 15 minutes of the print
- Check in on the print so often you can
- Retrieve the print as soon it is finished, in order to avoid others damaging it from removing it.
- Max 6 hours continuous printing between 10:00 and 18:00, and 16 hours between 18:00 and 10:00
- If you wish to print longer than 16 hours, ask 3Dprint@makentnu.no
- If you don't show up within 15 minutes, anyone else can use the printer
- If a print fails, pause it and contact us

A decorative graphic consisting of several teal circles of varying sizes and a large teal speech bubble pointing towards the bottom left.

3Dprint@makentnu.no
makentnu.slack.com

Other places to print

MAKE NTNU

HACKERSPACE



OMEGA VERKSTED



Questions?

- Find materials
- Change filament
 - Remember to secure the end in one of the holes on the spool
- Start
- Pause
- Cancel/Abort

