
THODE MAKERSPACE
3D PRINTING

3D PRINTING
LEARNING OUTCOMES

In this presentation, you will:

1. Become aware of Thode Makerspace's 3D printer booking process.
2. Know what 3D printing equipment is available in Thode Makerspace.
3. Learn about 3D printing Health and Safety.
4. Understand the 3D printing process from start to finish.

3D PRINTERS
INTRO

- Creates physical objects from a digitally created 3D model
- Thode makerspace 3D printers can be used for any kind of project, course related or not
- Students with access to 3D printers within course or department specific labs should complete the related course projects within those labs
- Students responsible for preparing and uploading their files into the 3D printer for printing
- Not necessary to stay with the printer for duration of the print time
  - Let makerspace staff know and leave name and email to help organize objects

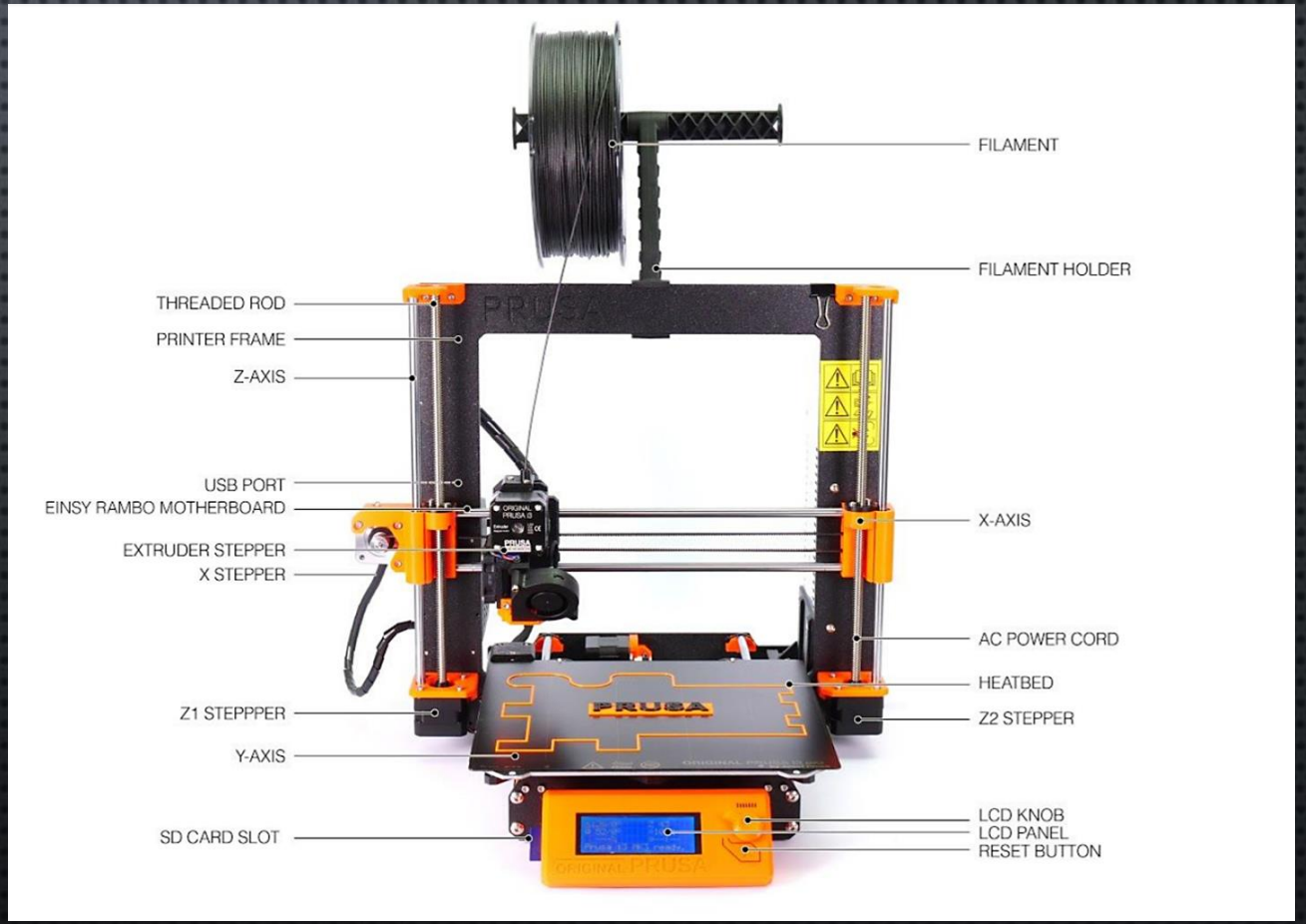
3D PRINTERS

BOOKING 3D PRINTERS

- 3D Prints must be completed within the booked time slot
- Cannot exceed Thode Makerspace's hours of operation
- Overnight printing is not allowed
- 1 booking allowed per person per day
- Max booking time is 4 hours
- Booking must be made 24 hours in advance on the McMaster Library booking site

3D PRINTERS
EQUIPMENT IN THODE MAKERSPACE

- Type of printer used: Prusa i3 MK3
- Uses 3D printing process called fused deposition modelling
  - Plastic filament called PLA is melted and deposited through a heated extruder nozzle in layers
  - Layers build up to create the physical form of an object that was once only digitally modelled
- Thode Makerspace only uses PLA filament which is free and provided

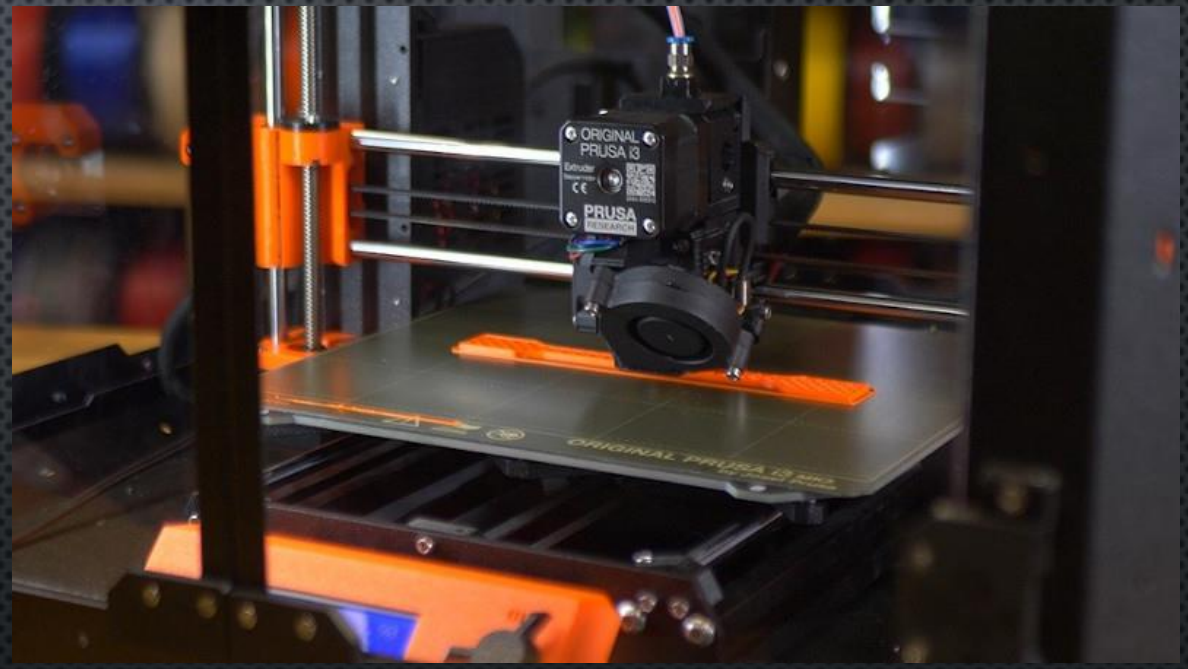


3D PRINTERS
HEALTH AND SAFETY

CAUTION: THE HEATED ELEMENTS OF THIS EQUIPMENT (HEATBED AND EXTRUDER NOZZLE) CAN CAUSE BURNS, AND THE MOTORS ARE A PINCH POINT HAZARD.

GENERAL POLICIES:

- NO PERSONAL PROTECTIVE EQUIPMENT (PPE) IS REQUIRED WHEN USING THE 3D PRINTERS IN THODE MAKERSPACE.
- 3D PRINTING WEAPONS OF ANY KIND IS PROHIBITED.
- IF YOU HAVE ANY QUESTIONS ABOUT USING THE EQUIPMENT, OR IF THE EQUIPMENT IS NOT FUNCTIONING PROPERLY, PLEASE IMMEDIATELY CONNECT WITH MAKERSPACE STAFF.



3D PRINTING PROCESS

3D PRINTING PROCESS
FILE DESIGN: RECOMMENDED 3D MODELLING SOFTWARE

Autodesk Inventor

(can access a free student, or educator license)

Professional-grade 3D CAD software for product design and engineering.

If you would like training on this software: LinkedIn Learning Course: Autodesk Inventor Essential Training opens in new window (4 hours, 39 minutes)

Autodesk Fusion 360

(can access a free student, educator, or hobbyist license)

Fusion 360 is a cloud-based 3D modeling, CAD, CAM, CAE, and PCB software platform for product design and manufacturing.

If you would like training on this software: LinkedIn Learning Course: Fusion 360 Essentials opens in new window (5 hours, 34 minutes)

TinkerCAD

(free of charge for all to access)

TinkerCAD is a free, easy-to-use app for 3D design, electronics, and coding. A great place for beginners to start.

If you would like training on this software: LinkedIn Learning Course: Learning TinkerCAD opens in new window (2 hours, 18 minutes)

Blender

(free of charge for all to access)

Blender is a free and open-source 3D computer graphics software toolset used for creating animated films, visual effects, art, 3D-printed models, motion graphics, interactive 3D applications, and virtual reality.

If you would like training on this software: LinkedIn Learning Course: Blender Essential Training opens in new window (4 hours, 52 minutes)

3D PRINTING PROCESS
FILE DESIGN: PRE-MADE 3D MODELS AND FILE FORMATS

Pre-made 3D Models

- Find and download pre-made 3D models using popular online sites. Makerspace recommended websites are:
- Thingiverse
- Printables

File Formats

- When saving your files be sure to save/export your 3D models in **.STL** or **.OBJ** format. These file formats are the most used and will yield the best results throughout the 3D printing process.

3D PRINTING PROCESS
FILE SLICING

- PROCESS: UPLOADING YOUR 3D MODEL INTO A SLICING SOFTWARE AND SLICING INTO INDIVIDUAL LAYERS
- SLICING SOFTWARE GENERATES THE TOOL PATH THE PRINTER WILL USE AND FOLLOW WHEN PRINTING.
- THIS FILE TYPE THE 3D PRINTER RECOGNIZES IS A .GCODE

Prusaslicer

The software PrusaSlicer is the standard slicing software used in Thode Makerspace. This software is available to use within Thode Makerspace and is free to download from the Prusa Website. PrusaSlicer has a print preview function to help you prevent print failures, and accurately quotes how long your object will take to print.

If you would like an in-depth PrusaSlicer walkthrough Makerspace recommends: TheFirstLayer Youtube: PrusaSlicer An In-Depth Walkthrough from Install to Print opens in new window (36 minutes)

3D PRINTING PROCESS
FILE PRINTING

3D PRINTING
NEXT STEPS

Please complete the 3D Printers Quiz.

- All quizzes are located under "Assessments" in the course tool bar.
- You must obtain a score of 100% on the quiz, then complete the in-person training and get your Makerspace Safety Passport signed.

In-Person Training

- To book in-person training for this resource please book a 30-minute timeslot on the equipment and for the purpose of your booking please write 'in-person training'

QUESTIONS?

THANK YOU

MKRSPACE@MCMASTER.CA