# Structural Design Optimization – 3D Printing Guide

## 1. Schulich Library 3D Printing Service (Free)

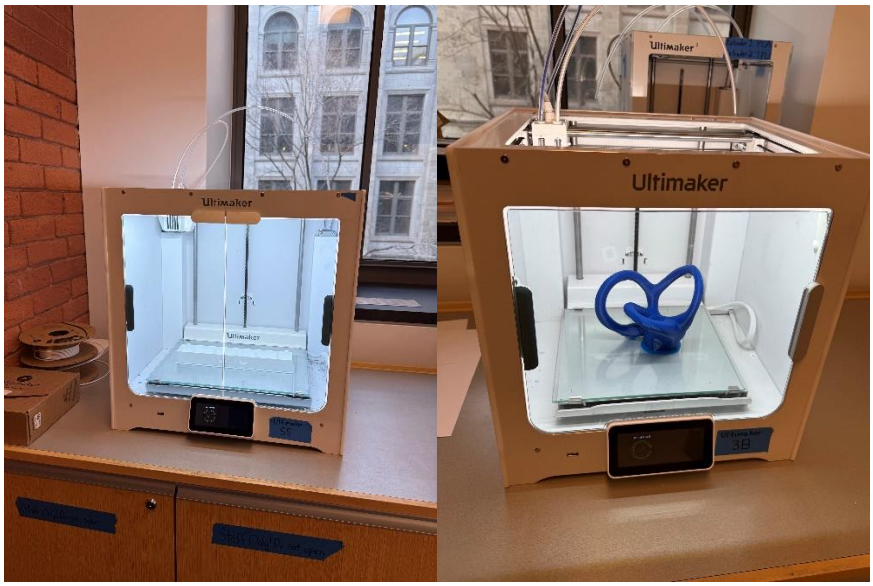
- **Overview**

  The Schulich Library offers multiple FDM printers (e.g., Ultimaker S5, Ultimaker 3)

  The service is open to all McGill students and requires prior registration.

  Print jobs must be submitted in advance using the official submission form.

  Please be mindful about the deadline and reserve enough time (at least 1 week) for printing.




- **Operating Hours**

  Monday – Friday: 9:00 AM – 5:00 PM.

  Service Desk: Print pickups are available during operating hours.

  **Main Link:** Schulich 3D Printing Information

## 2. Step-by-Step Guide for Schulich MakerSpace

- **Step 0: Register for the Service**
  **(I suggest that you register by 03/11/2025 as it takes time to process registration)**

  Before submitting your first print job, you must read the regulations and register online.

  Visit Registration Portal and complete the required safety training.

- **Step 1: Prepare Your Print Job**

  Your job must be an .STL file and should take under **15** hours to complete. (Please see Appendix A on how to estimate the time).

  For requests exceeding 15 hours or 20 hours per week, email graeme.langdon@mcgill.ca.

  If you need help preparing your job, contact 3dprint.schulich@mcgill.ca.

- **Step 2: Submit Your Print Job**

  Use the 3D Printing Job Request Form to upload your .stl file to OneDrive and submit your request.

  File link *

  - **Upload your .stl file to OneDrive** and copy + paste the link below.
  - Make sure that the file is **viewable by "People in McGill University"** so that we have access to it!

  Enter your answer

- **Step 3: Monitor Your Email**

  Look out for updates from the 3D Printing Assistants regarding the status of your print job.

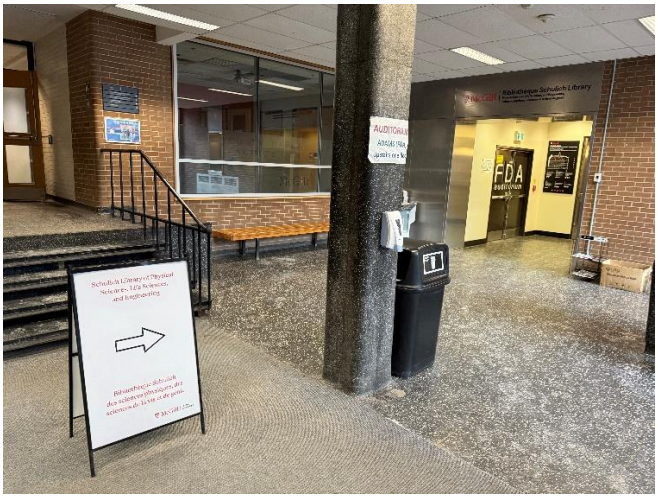
- **Step 4: Pick Up Your Print**

  Once your print is complete, collect it from the Schulich Library Service Desk during service hours.

- **Directions**

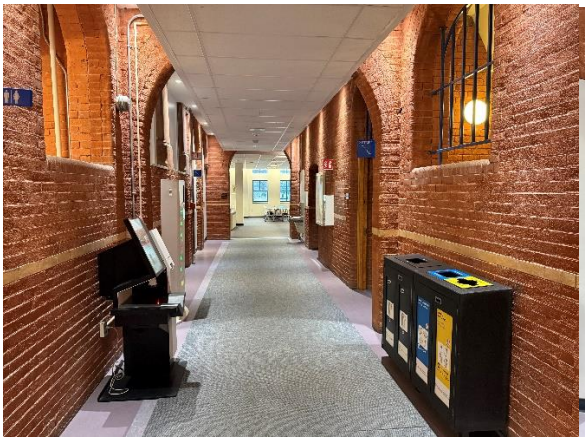
  **1. Enter through the Adams Building.**

**2. The Schulich Library will be on your right-hand side.**




**3. Turn right when you reach the library front desk.**

**4. Take the elevator or stairs located on the right-hand side of the hallway.**



**5. The 3D printers are in Room 404.**


## 3. Rates and Fees

- **Material Costs:** The 3D printing service at Schulich Library is free for students.
- **Filament Types:**
    - PLA: Available in a variety of colors. However, preferred colors cannot be guaranteed.

- PVA: Available for support structures.


- **Note:** Confirm material availability before submitting your job.

**4. Useful Resources and References**

- YouTube Tutorials:
  - "Slicing Basics with Cura"
- Websites:
  - All3DP Beginner's Guide to 3D Printing

**Additional Notes**

- Environmental Tip: Recycle failed prints and minimize excessive support material usage.

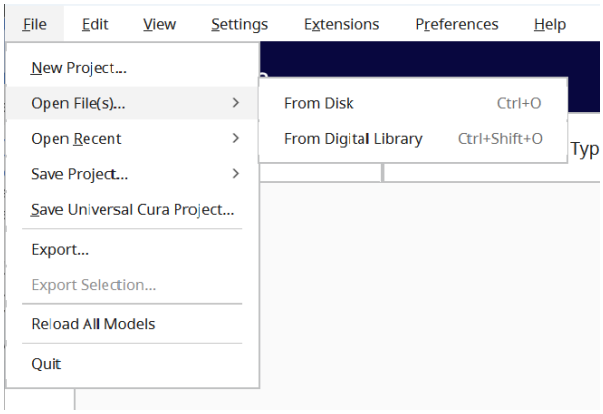
**Student-Led 3D Printing Service**

- In addition to Schulich Library's **3D Printing Service**, McGill students can access a student-led 3D printing service through the **MAME Fishbowl** initiative.
- For more information, visit their Instagram page.
- This service may provide additional opportunities for creative projects and support.

## Appendix A

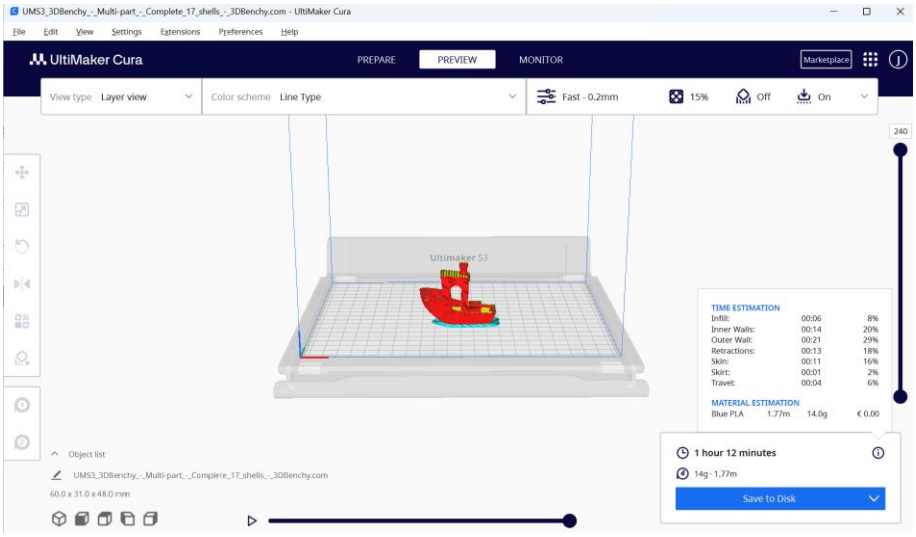
## How to Check the Estimated Printing Time in Ultimaker Cura

1. **Install and Open Ultimaker Cura**
    - Ensure you have Ultimaker Cura installed on your computer. If not, download it from the Ultimaker website and follow the installation instructions.
2. **Prepare Your File**
    - Launch Ultimaker Cura and load your 3D model file:
        - Use the File > Open File(s) menu or simply drag and drop your .stl or .obj file into the Cura workspace.




3. **Set Up Your Printer and Profile**
    - Choose your printer model from the Printers dropdown menu.
    - Select the material type and quality profile that matches your intended print.
4. **Inspect Your Model**
    - Use the Move, Scale, and Rotate tools to position your model correctly on the virtual build plate.
5. **Slice the Model**
    - Click the Slice button at the bottom right corner of the interface.
    - This step processes the model based on your printer and settings to prepare it for printing.
6. **View the Printing Details**
    - Once slicing is complete, a summary will appear, showing:

- Estimated Printing Time: Total time required to complete the print.
- Filament Usage: Amount of filament in meters or grams.
- Weight: Approximate weight of the printed model.




7. **Advanced Tips**
    - To refine your estimate, adjust the settings under the Custom Settings tab. Key factors include:
        - Layer height
        - Infill density
        - Print speed
        - Support structures
8. **Export the G-Code**
    - If satisfied with the estimate and settings, click Save to File or Save to Removable Drive to export the G-code for your 3D printer.

**Video Tutorial Suggestions:**

- **Look up detailed videos on YouTube by searching for "Ultimaker Cura slicing tutorial" or "How to estimate printing time in Cura." These can provide visual guidance on the process.**
- **Useful Detail Tutorial:** https://youtu.be/nZZ2mwe6gkM?si=osL18MUUa6fFvYJ8