

# Faculty of Engineering and Design

## Engineering Design Centre

### Additive Manufacturing Lab (ME 2521)

#### 3D Printing Charge Policy

Rev	Date	Notes
0	20 September 2023	First draft for review and comment
1	1 December 2023	Initial release following incorporation of feedback

**FED EDC Information Hub:** <https://carleton.ca/engineering-design/engineering-design-centre/>

**Additive manufacturing contact email:** [3dp@carleton.ca](mailto:3dp@carleton.ca)

**Objective:** Ensure equitable and expedient access to 3D printing resources while managing costs, minimizing waste, and promoting responsible use by teams and capstone project groups.

**General Policy:** Staff will evaluate all 3D printing requests and prepare a cost estimate based on material usage, technologist labour, build time, and machine wear. Every print job, regardless of its final waiver status, will be costed in full. This ensures transparency and emphasizes the inherent value and cost of each job and helps manage limited staff and printer availability. All printing requests must have been reviewed and approved by a responsible person prior to submission (e.g. lead engineer, teaching assistant, faculty supervisor, team captain/design lead, or technical staff). Printing requests will be prioritized in the same manner as other manufacturing requests:

1. Urgent teaching lab/facility maintenance
2. Undergraduate/graduate coursework (e.g. Capstones, design courses)
3. Regular teaching lab maintenance
4. Research support
5. Extracurricular projects
6. All other requests

Overall costs, material consumption and machine maintenance will be reviewed at least annually and this policy will be modified as needed to ensure it meets users' needs while remaining sustainable for the university. All users should be reminded that there is an intrinsic cost associated with each print. While some fees may be waived as per this policy, they are never truly absent.

If acceptable proof that a part is associated with approved coursework, Capstone, or Design Team is not provided, then printing requests will be refused and/or the full cost applied.

**Fee Waivers:** Qualifying print jobs may have fees waived as part of the departmental/university support. The following factors will be considered collectively in making a fee waiver determination.

1. **Intended end use of Printed Component(s):**
  - Fees may be waived for (with faculty/staff review and approval):
    - **FED Teaching:** This includes approved coursework and capstone projects.

- **FED Extracurricular:** Registered CSES clubs and engineering competition teams
  - **FED Outreach:** Summer camps, day camps, Enrichment Mini Courses, etc. These requests will always be forwarded up to FED/MAE management for discussion and review prior to any fee waiver determination.
  - **Non-FED Teaching and Extracurricular:** other Carleton University courses, CUSA/GSA clubs, teams and groups. These requests will always be passed up to FED/MAE management for discussion and review prior to any fee waiver determination.
  - Fees will not be waived for:
    - **FED and non-FED Research:** These prints will be billed back to the corresponding faculty member. Printing will not take place without faculty approval in writing (email) and a valid fund number provided in advance. eShop invoices may be generated for larger jobs and sent to the faculty member for approval.
    - **Personal student/staff/faculty/general public projects:** This includes any non-university related printing, personal/home projects, and printing not associated with any approved coursework, team or club. These requests will be reviewed and considered on a case-by-case basis.
2. **Material Selection:**
- Fees may be waived for commonly used lower-cost materials, such as TPU, PLA, PETG, materials that do not require special handling/labour, and materials that do not cause excessive wear to the printer.
  - Notwithstanding the above, fees may not be waived for exotic or specialized materials like Ultem/PEI, Nylon/PA, PEEK, and filled-polymers (e.g. chopped carbon), which might be costlier or can cause accelerated wear to equipment. Novel materials with unacceptable/unknown health and safety risks will not be accepted for printing.
3. **Component Volume:**
- Fused deposition/extrusion-based parts should fit within an easily visualized volume as determined for each machine, e.g., 100 x 100 x 100 mm.
  - DLP resin parts should adhere to a smaller volume boundary due to their higher material costs and the increased staff time necessary for post-processing.
4. **Other Considerations:**
- **Batching:** Fees may not be waived for printing multiple iterations of the same part after the initial trial/prototype print.
  - **Repeated Iterations and redesigns:** Fees will be reinstated for parts when there are frequent minor design changes leading to multiple reprints.
  - **Special Requests:** Jobs that demand significant staff input, special setups, or extensive post-processing will incur charges.
5. **Management Discretion:**
- Department staff and management have the authority to use their discretion when waiving charges for any of the above. For example, a large but hollow print that consumes minimal material and labour, might be treated differently than a smaller, dense part with complex supports and significant post-processing.