Workshop

#sawdustandglue

“Making things” is necessary to design education.

The SAPL Workshop is a facility for students and faculty to build models and prototypes of their design work and helps to aid pedagogical and research aims. The workshop is well equipped, and can facilitate fabrication in a variety of media, including wood, plastic and metal. The workshop also provides space for finishing techniques including painting and sandblasting. Additionally, the workshop offers access to leading-edge digital fabrication equipment, including laser cutters, two CNC routers and 3D digital printers.

Safety is a fundamental tenet of workshop use. To this end, access to the workshop is a privilege, contingent upon the safe, clean, and courteous use of these facilities. Access to the workshop will be denied to users who do not use the workshop in a safe and courteous manner.

[**To reserve equipment in the workshop, visit SAPL Bookings.**](https://evdsbooking.ucalgary.ca/booked/)

[**Download the SAPL Workshop Student Handbook.**](https://evds.ucalgary.ca/files/evds/evds-workshop-student-handbook.pdf)

# WORKSHOP GENERAL ACCESS

Access is available only to those students, staff and faculty who have completed the workshop skills course.

The workshop skills course consists of both hands-on tutorials and a written exam.

Users must also complete the Provincial WHMIS safety course, as administered by the university.

Continued access is contingent upon safe and clean work habits. If a user does not maintain a clean workspace or use the workshop safely, workshop access will be denied immediately.

Working alone in the workshop is not permitted. The onus is on users to ensure that at all times, someone else is present when using the shop.

Occupying or using the workshop when impaired is strictly prohibited. This includes impairment due to sleep deprivation (staying up all night), alcohol or drug consumption.

Workshop technicians maintain the workshop equipment and are available to provide fabrication advice, tips or specific instruction in building models, prototypes, etc.

Workshop technicians are not available to build student models/projects.

The workshop is only to be used for pedagogic and research purposes, as defined by the University of Calgary.

The workshop may be used for personal/outside or professional use provided users maintain the necessary liability insurance and sign a lease agreement with the faculty. Priority is given to pedagogic and research purposes; outside use may be denied during peak use times. Outside use fees apply (see fee schedules below).

Workshop hours are 8:30 a.m. until 4:30 p.m. daily.

Afterhours access is allowed for assembly work only. Please note that for safety, power is cut off to the equipment after hours.

Materials may be purchased until 4:00 p.m. daily.

Materials/projects cannot be stored on the workbenches and must be properly stored in student lockers or assigned storage areas.

# PAINT BOOTH ACCESS

The paint booth is available for the use of aerosol paints and adhesives.

Access to the paint booth is available as part of access to the workshop.

Users are responsible for keeping the booth tidy and for the disposal of empty spray cans in the appropriate containers.

The fan and light are only to be used when the booth is being used for spraying.

These must be turned off when the spray job is completed.

To comply with safety codes, users must track their use of the paint booth, noting the time and type of spray. A form is posted for this in the workshop.

# LASER CUTTERS

The laser cutters are shared pieces of equipment. They are also in very high demand. It is therefore important that we all treat this equipment with respect and care to maintain its availability for everyone. A damaged, out-of-order machine helps no one.

Access to the laser cutter requires specific training on the equipment. This must be taken annually.

Laser cutter training is required in addition to the workshop skills course and WHMIS.

Users must sign a use agreement annually with the faculty for continued access to the laser cutter.

Users must be in attendance while using the laser cutter, that is, in the room and watching the machine. No exceptions to this are permitted.

Users who leave the laser cutter while it is running will be denied access to the laser cutter for a designated period, or permanently, this will be determined at the discretion of the workshop Supervisor.

Only accepted materials can be cut on the laser cutter (see material list below).

Users must use the online booking system.

When using the laser cutters, users must log into the computers in the laser cutter room using their University ID.

Users may book a maximum of 2 x 60-minute (for a maximum of 120 minutes) timeslots per week.

The booking schedule is updated on a weekly basis, i.e. the machine can only be booked one week in advance - 9:00 a.m. Monday.

The laser cutters are available on a 24/7 basis.

If there are unbooked slots, users may book these on a first come, first serve basis. Users may only book one additional unreserved slot per week, contingent upon availability.

Users must start their jobs within 5 minutes of their scheduled timeslot or forfeit their timeslot.

There are no exceptions to this

A minimum of 3 hours advanced notice must be given to cancel a timeslot.

Users must complete their jobs and tidy up the laser cutter within their booked timeslot so as not to delay subsequent users.

Users are responsible for cleaning the lens and mirror before every laser job. There are no exceptions to this. Instructions for cleaning the laser lens and mirror will be posted by the machines and will be included in the annual training, this is for the Trotec lasers only. The Boss lasers will be cleaned regularly by the technical staff.

Users cannot adjust the preprogrammed settings for the laser cutter.

Users must report any damage incurred to the laser cutter immediately. If damage occurs after hours, then it must be reported by 9:00 a.m. the next day. If such damage is not reported, access for all users may be denied.

Access to the laser cutter will be denied to users who do not strictly follow the use protocols outlined here.

**ACCEPTABLE MATERIALS FOR USE WITH THE LASER CUTTER**

**-** Acrylic, up to 6 mm thick

**-** Balsa wood, up to 6 mm thick **/** -- ---Hardwoods, up to 6 mm thick

**-** Plywood, up to 6mm thick

**-** Cardstock/matt board up to 6mm thick

**-** Paper

**-** Fabric

**-** Leather

**-** Mylar, vellum

**-** Any thickness for engraving

**-** Glass (engraving only)

**-** Anodized aluminum (engraving only)

**-** Under no circumstances can polycarbonate (lexan), styrene, or any resin that creates a chlorine off-gas be used

# CNC ROUTER

Access to the CNC router occurs via the workshop technicians.

Timeslots are booked on a first come first serve basis and individuals need their files ok’d and material ready before being granted a time slot. The CNC schedule is displayed on a sign-up sheet posted outside the technician’s door.

The CNC router can only be run while workshop technicians are in the shop, during regular workshop hours.

Users must build their own CAD files to the required resolution and format (to be determined).

Users must prepare material blanks for machining. Users are responsible for ensuring the material is ready in due time for use.

All CAD files must be reviewed and approved by the workshop technicians prior to booking the machine.

Only when CAD files have passed a review and the material blanks are prepared can users book the CNC.

CNC bookings occur on a first come, first serve basis. Timeframes are difficult to predict.

Cancellation of a booked CNC timeslot must occur 1 day prior to the day before the booking.

Users are required to clean up the machine after use occurring within the scheduled timeslot. If the machine is not cleaned for the next job the student will not receive their work.

Users cannot be in the same room as the router while it is running (the rooms are controlled so that a machine will turn off if anyone is in the room).

Users must be present to set up prior to, and clean after, their jobs within the allocated time.

The workshop will provide bits for use. Smaller bits or specialty bits are to be provided by users (discuss requirements for bits with the workshop technicians prior to purchasing).

Fees for use of the CNC are noted in the schedule below.

**ACCEPTABLE MATERIALS FOR USE WITH THE CNC ROUTER**

**-**Various hardwoods

**-** Softwoods (though not typically recommended)

**-** SDF (sustainable design fibreboard) and Various foam products

# 3D PRINTER

Access to the 3D printer occurs via the workshop technicians

Users must build their own CAD files built either as solid parametric models or surface models which are watertight (i.e. no gaps in the surface model) and exported as .stl files, and saved at an appropriate resolution, and scale.

Timeslots are booked on a first come, first serve basis with priority given to pedagogic requirements

Users are responsible for their own part clean up, i.e. removing support material

The workshop is not responsible for part durability during clean up or later model work.

Cancellation of timeslots must occur prior to 4:00 p.m. the day before your booking

# FEE SCHEDULES

## STUDENTS ENROLLED IN-STUDIO COURSES

Students pay a workshop access fee automatically when they register in a studio course and this includes the following:

**-** General access to the workshop, its standard equipment and hand tools (contingent upon safe and courteous use of the workshop, as outlined above. The fee is nonrefundable).

**-** Access to the laser cutters, toolpath preparation work and the CNC router

**-** $0.25 per gram for PLA Filament on the 3D printer (based on the cost recovery of materials) The workshop will not use students purchased filament.

**-** If mis prints are due to student error than the cost of that error print will be paid for by the student.

Students not enrolled in a studio course and who wish access to the workshop (e.g. for their thesis research) must pay for access as per the researcher fees noted below, so please plan accordingly.

## RESEARCHERS, INCLUDING THESIS STUDENTS

Researchers must pay to cover the costs of wear and tear on the machines they use.

 **-** $150.00 workshop fee or

**-** $2.00 per minute of use on the laser cutter

**-** $0.25 per gram on the 3D printers (based on the cost recovery of materials)

**-** $45.00 per hour for CNC toolpath generation

**-** $45.00 per hour for CNC router use (30 minutes minimum)

Please ensure that you budget to accommodate these costs in developing new research proposals.

## PUBLIC/PROFESSIONAL USE

This applies to outside personal use (i.e. nonacademic) or when performing professional (or consulting) work for a client. Fees for the use of the workshop for these activities are comparable to typical industry rates.

**-**$15.00 for workshop access and bench time (if the individual has obtained the required Insurance coverage dictated by the University of Calgary)

**-** $2.00 per minute for the laser cutter (30-minute minimum charge, jobs managed at the discretion of workshop technicians)

**-** $0.40 per gram for the 3D printer

**-** $12.00 per build tray (per build) for the 3D printer

**-** $150.00 per hour for CNC toolpath generation

**-** $150.00 per hour for CNC router use (30 minutes minimum)