

IMPERIAL



Workshop Handbook
2023-2024
v5.0

**Dyson School of
Design Engineering**

1. General Information

The ACE workshop is the place where students of the Dyson School of Design Engineering can manufacture and test items for their project work.

The ACE workshop is primarily used by DE undergraduates and IDE/GID/PhD students for the production of group and individual project work. The ACE workshop is for woodworking, plastics, metalworking and assembly.

1.1 Access & Supervision

The workshop is supervised by DE technicians between the hours 09:00-17:00 Monday-Friday. The area is supervised by both full time and part time staff, users must follow staff instructions regarding behaviour and use of equipment at all times. Senior staff will determine what activities students may undertake within the spaces.

Entry to the ACE workshop is by swipe card. Areas of the workshop are open outside of supervised hours, access times are below: Students have access to the bench area, consumable wall and tool cabinets. Mains power will be turned off when technicians are not present. Hand tools and battery tools can be signed out for after hours working; there is no lone working allowed in the workshop.

Access times

ACE 151 ground floor bench area and 151 Mezzanine: 08:00-22:00, 7 days a week excluding college closures days.

ACE 150 machine shop and 150 mezzanine: 09:00-17:00, Monday-Friday excluding college closures days.

1.2 Space Usage

The cleanliness of the workshop is extremely important since this is a heavily used area. Every day at 16:45 students are requested to clear down their bench areas and return tools. Students are allowed to continue working after 17:00, however they are expected to keep their work areas clean. Project work should not be left out unless permission is given by the technical team. If project work is left out without permission then the technicians have the right to dispose of these items. The technicians are there to support student work and keep the workshop operating effectively, however it is the responsibility of all users to keep the condition of the workshop in a good state.

Regarding afterhours access, if the workshop is found to be left in an unacceptable state, equipment is found damaged or unsafe activities are being carried out. Student groups will receive a warning for the first incident, further action will be taken after the second incident; the workshop will be closed to all users.

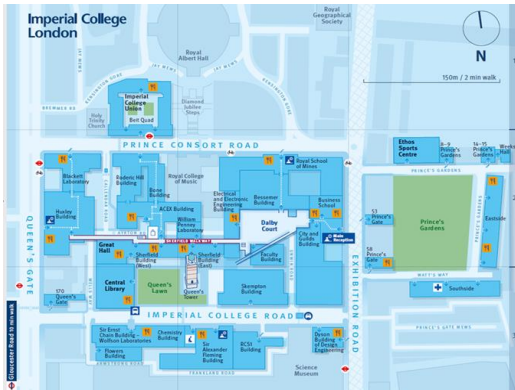
In the case of infringements of appropriate actions and behaviour, this includes incorrect PPE, unsafe working, following Health and Safety guidance, professional working behaviour including respect for staff and students, Technical staff will take the following sequence of actions, as required, if the action or behaviour is not immediately addressed, or repeated in any form, and at any stage:

- A clear verbal warning will be given.
- An email written warning will be given and the relevant module tutor cc'd.
- The student receives a 2 week ban from using the workshop and the relevant module tutor advised to arrange an alternative strategy for fulfilling any submission requirement
- The student will be subject to College disciplinary action

In general, the workshop is open access to all students however there are times when the workshop is booked out for certain events i.e. training sessions or is busier in the run up to module deadlines.

1.3 Workshop location

The workshop is located in the [ACEX Building](#) on the map below and can be accessed via the Sherfield walkway or from the entrance via Prince Consort Road.



A more detailed map can be viewed using the link below:

[South Kensington Campus](#)

1.4 Training

Users must complete a safety induction and workshop course. If a user has not completed an induction they are not allowed access to the facility. The safety induction covers the operating rules for the workshop, this is completed online and a quiz is taken at the end. Users must pass the quiz in order to attend the workshop course.

The workshop course provided is an hour session where students will be inducted to use **green** and **amber** spot equipment such as battery drill, band saw, pillar drill and sanders, turning and milling. Sign up sessions are available for DE1, the induction is arranged for IDE1/GID1 students in the first academic term. For others please contact the Technical Services & Safety Manager to arrange training.

Each session of the workshop course will be lead by a member of the technical team and an overview of machines will be given. During the course, users will be

assessed on the ability to understand and follow the instructions given. If a user is unable to demonstrate the required ability to use the machinery safely a user can be failed.

To access the induction:

- Login to Blackboard:
<https://bb.imperial.ac.uk/>
- Go to DEo-TW Teaching Workshop (2023-2024)
- Review the workshop material for the ACE workshop
- Complete ACE workshop quiz, you must pass and will have 5 attempts

1.5 Emergency contact numbers

Security - First aid, fire or police emergency (24hrs) 020 7589 1000

General (24hrs) internal ext. 48910 or 58920

If assistance is required, please contact **Security** using the internal phone by main entrance of the workshop.

If you do not have access to an internal phone, please contact **Security** at South Kensington Campus on 020 7589 1000 or via the [SafeZone App](#)

Health centre Contact number 0207 584 6301

Location 40 Princes Gardens SW7 1LY

Opening hours Term time Mon-Fri 08:00-18:30 Out of term time Mon-Fri 08:00-17:00 Sat-Sun closed

1.6 First Aid & Fire safety

Workshop First Aiders are Ingrid Logan (MHFA) and Claudia Morgan. Full list of Department first aiders and MHFAs can be found by the internal phone next to the main entrance of the workshop.

First Aid box and Burns kit are located outside the technician's office and on the mezzanine floor (151).

Eye wash stations are located by each sink.

In event of an evacuation assembly points are, point B: Aero Car Park and point C: Bone Courtyard. Further information can be found on the [ACEX GEEP](#) (Generic Emergency Evacuation Plan) and Fire exits.

Under certain circumstances a user may require a Personal Emergency Egress Plans (PEEPs), more information can be found on the College Estates [website](#). Please contact the Department Disability Officer and Well-Being Advisor in Design Engineering; [Danny Lee](#)

1.7 Equipment, consumables, and storage

The ACE workshop has a range of equipment available for students to access. The access to different pieces of equipment follow the traffic light system (**Red, Amber, and Green**) which are referenced in the link. Green spot equipment can be accessed at all times. Red and Amber equipment can only be accessed during times when the technicians are present.

Hand tools are stored in the cabinets in the ACE workshop. The department runs an honour-based system where students can use tools within and outside supervised hours, based around trusting students to return the tools after use and reporting any damage to the tools. We have a no blame policy so please do report any damage to tools, we just wish to maintain a good stock of equipment for students. Please respect the policy such that tools are available as and when needed.

A list of all the available hand tools and equipment, and level of access can be found in the link below. Mains powered tools will not work after the technical team at the end of their working day for health and safety reasons.

[ACE Workshop equipment and hand tools](#)

3D printers and laser cutters are an essential tool for prototyping. The ACE workshop has a range of 3D printers and laser cutters to support student work.

For the plastic fused deposition modelling (FDM) machines there are 20 Prusa Minis, 2 Ultimaker 3, and 10 Bambo Lab 3D printers. For laser cutting there are 2 laser cutters, Denford VLS3.60 and VLS4.60. These can be booked **after completing an induction**. It is the responsibility of the students to make sure that the machine is returned to the same condition as it is found in (i.e. their print has been taken off and cleaned down).

There are 2 more 3D printers: Projet 2500 and Omni Net. These machines are operated only by the technicians for health and safety reasons and prints are made by request through the requisition system.

The Prusas, Ultimakers and Bambu's are run at zero cost to students. For the Projet and the Omni, a print request must be submitted online with an STL file and a quote will be provided.

To book a 3D printer or laser cutter please use the 3D Printer booking or Laser Cutter booking calendar on Outlook 365. **You must have completed the inductions to use these machines.**

When booking a laser cutter or 3D printer please create a "New event", select the appropriate calendar from the drop-down menu. Information required: your name and the machine being booked, for example - "John Smith - PrusaMini-3".

Laser cutters: VLS4.60 or VLS3.50 3D printers: Ultimaker 3 (UM3) or Prusa Mini

The laser cutters can be booked between 09:00-16:30 Monday-Friday, excluding 13:00-14:00 (technicians' lunch)

Files and material should already be prepared to avoid bookings over lapping.

The 3D printers can be booked between 09:00-17:00, 5 days a week excluding college closure. 3D printers will

operate 24/7 if longer prints are required, please ensure booking details are up to date when creating a booking.

The ACE workshop provides a range of consumables for students to use for their projects. The list of standard consumables is listed below, and these can be found in the storage locations around the workshop. In normal circumstances these consumables should always be in stock but in case of high usage and one is running low please contact a technician to inform them.

[ACE workshop Consumables.pdf](#)

For materials which are not included in the materials list please contact workshop manager to make arrangements for procuring these but please bear in mind that there will be lead times associated with this. A common site where you might find components is RS (<https://uk.rs-online.com/web/>) and Farnell (<https://uk.farnell.com/>) and component lead times are typically listed. Please factor this into your work.

The ACE workshop provides project boxes for the storage of student works. At the end of each academic year these are cleared out so if there are items which you would like to keep please take these before it is cleared out. Please speak to the workshop team about accessing project boxes.

Work will not be stored in the ACE workshop indefinitely and all stored work should be clearly labelled with the student's name. No hazardous material should be stored in the project boxes.

1.8 Material Requisitions

Students must have a budget to request materials from the ACE workshop. The module leader or project supervisor should allocate this budget. Requests are usually approved within 48 hours subject to the student's budget. Please submit all material or 3D print requests (Project and Omni only) using the link below.

[ACE Workshop Requisition Form](#)







Sheet material such as plywood and plastics can be found in the material store in the machine shop of ACE. A list of the materials is shown in the link below. The material store also contains offcuts which students are free to use should they want at zero cost/also contribute towards.

[ACEX Materials Price List](#)

For metals these are ordered through Mechanical Engineering Stores via Technical Services & Safety Manager. Please contact [Ingrid](#) with reference to the below material list.

[Metal Stock List - ME Stores 2023](#)

1.9 Workshop Team

	Ingrid Logan Technical Services & Safety Manager i.logan@imperial.ac.uk		Gordon Addy Senior Technician g.addy@imperial.ac.uk
	Karl Addy Technician k.addy@imperial.ac.uk		Tito Nwofor Workshop Assistant t.nwofor@imperial.ac.uk
	Claudia Morgan Technician claudia.morgan@imperial.ac.uk		Chloe Allen-Greeves Technician c.allen-greeves@imperial.ac.uk

2 Workshop Rules

General behaviour
Persons that have not completed the workshop induction are not permitted in the machine area. Persons involved with a project or activity need to seek permission from workshop staff before entering the workshop.
There is no access to the ACE workshop during pre-booked activities and during training sessions.
Do not run or take short cuts between the machines, the walkway through the workshop is clearly marked.
All users must wear a lab coat at all times in the workshop. This includes visitors and members of staff. Safety glasses must be worn when working on machinery or with power tools.
All users must wear suitable footwear. Footwear must enclose their entire foot; boots or trainers are acceptable providing they are considered durable. If a user's footwear is deemed unacceptable, they will be asked to leave the workshop.
Coats and bags should be left in designated space provided and not left around the bench area and walkways.
The use of mobile phones and headphones are prohibited in this area.
Eating and drinking is not permitted in the workshop.
Always wash your hands before leaving the workshop.
All users must provide a technical drawing or detailed sketch of the design they would like to produce unless under the supervision and instruction of technical staff.

Only use equipment as you have been shown, if in any doubt about how to use a piece of equipment seek advice and assistance from technical staff.

All accidents or near misses in the area must be reported to a member of staff. All Accidents, Incidents or Near-misses must be reported in SALUS.

Any damaged or broken equipment must be reported to a member of staff. Equipment must be taken out of service until repaired.

Keep your work area clean and tidy. The workshop operates on a clean bench policy; practicable unless given permission by technical staff, all users must clear their work area before they leave. Unpermitted work will be cleared the following morning. Storage boxes are for work in progress.

Machine tools

All machines are colour coded:

RED spot machine: For use only by technical staff E.g., Circular saw, CNC router.

AMBER spot machine: For use by students under the supervision of technical staff after completing the safety induction. E.g., Band saw, pillar drill, sander, laser cutter.

GREEN spot machine: For use by students without supervision of technical staff after completing the safety induction. E.g., Cordless power tools.

Always check you know how to stop a machine before you start it.

Never walk away from a machine leaving it running. Always switch it off when you are done.

Do not distract others working on a machine.

Always check the direction of rotation of the cut before starting.

Never try and stop a chuck with your hands, wait for the machine to stop before doing anything.

Never leave a chuck key in the chuck or spanners on driven spindles.

Cutting processes can be hot. The workpiece or tool may be hot, do not attempt to remove/change anything until it has cooled.

Users wearing a lab coat must wear trousers. Shorts and skirts are not allowed.

Safety glasses must be worn at all times when operating machines, working near the machine and including the use of cordless power tools.

Long hair must be tied back securely when operating a machine.

All loose jewellery (bracelets, necklaces and rings), neckties/scarves and any other loose or baggy clothing must be removed when operating a machine.

Use a push stick provided to cut small pieces of material or control a workpiece when on a band saw.

Any faults with machinery should be reported immediately to a technician.

Additional rules for the workshop
Lone working is not permitted under any circumstances. There must always be at least 2 people in the workshop.
To enable identification, users must carry their ID card whilst working in the area.
In the case of emergency and in the absence of staff, call 0207 589 1000. This number will connect you to IC security who will coordinate, do not call 999.
Personal electrical power tools or equipment must not be used in the ACE workshop.
Tools are not to be removed from the ACE workshop.
Check with technical staff first before using or removing materials from the workshop.
No mains powered tools are allowed during un-supervised hours, cordless tools may be signed out for use after hours.
Dust extraction is provided for equipment including sanding benches, always use the extraction provided on machinery to keep dust to a minimum.
Any material brought into the area must have a completed and approved COSHH assessment. COSHH must be approved by the project supervisor and workshop manager.
Always follow the instructions on the material safety data sheet and use the designated area for work with substances. Special care is required for the use of paints and solvents within the workshop.
All project equipment must have a completed risk assessment, approved by the Department Safety Officer. General risk assessments are completed for the workshop, if activity is not covered by the workshop RA a separate document needs to be completed.
Experiments or testing cannot be left unattended and must not run without prior approval of the Department Safety Officer and workshop manager.
Any equipment brought in for project use that uses mains power must be PAT tested and approved before use. Equipment should be tested by an Imperial College Electrician. Please speak to workshop staff beforehand.
All work must be stored in a safe condition when leaving the workshop. Work must be removed at the end of a project.
Cordless power tools are to be returned to workshop staff after use. Cordless power tools can be signed out for after-hours use providing the user has completed an induction.
User numbers in each area must not exceed max occupancy numbers determined for each area. These numbers include staff and students, and individual(s) may be asked to leave if exceeded.

Version 5.0 Adapted by Ingrid Logan - 28/02/2024