

# Laboratory Induction For Projects

Working within the laboratory

# Staff

A number of technicians maintain the laboratories, and some have specific roles?

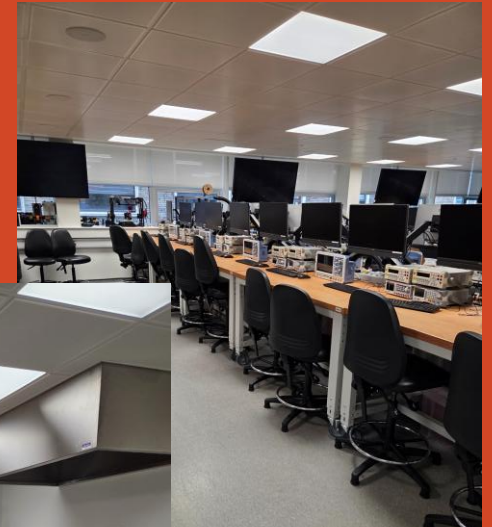
- 1 Gerald McBrearty - Lab Manager.
- 2 Andrew Moss – Lab technician, lab safety officer, 1st aider (body ad mind) and Senior fire marshal
- 3 Muhammad Omer- Lab technician, Well being Champion and Fire marshal.
- 4 Noordeen Marikkar – Lab technician and Fire marshal.
- 5 Martin Scott – PCB Technician.



# Location, Location, Location

Work areas are split into multiple locations each offering different activities/equipment. Make sure you know where you intend to work as it has to match your risk assessment.

- 1 Main Teaching Laboratory – Room 6.02 – General use for experimenting with circuits and basic test/measurement kit. Also offers/contains 3D printers, Vacuum forming and Laser cutting.
- 2 Project Laboratory – Room 6.12 – Main location performing projects for experimenting with circuits and basic test/measurement kit. Also offers/contains Soldering stations with fume extraction, Reflow ovens, IR soldering station, Microscopes storage for projects, Fixings, Hand tools, PPE, etc.
- 3 PCB Workshop – Room 6.10A – This is where pcbs are manufactured using drilling machines, CNC routers, Chemical processes, and collected. The location is run by Martin Scott.
- 4 Technician office – Room 6.10 – This is where you can find the technicians for any assistance.



# When Open \ Close

UCL has specific working hours and closure periods that we have to adhere to when operating the laboratories.

- 1** Operating hours The lab is officially open from 9am until 6pm Monday to Friday. But these time may vary depending on staff absence and other activities, notices will be in place to inform you.
- 2** Closures – Certain times of the year the lab will have to close for projects due to teaching schedules and college closures. You will be informed close to the time via email and/or lab notices.



# Accident and Emergency

The laboratory has 1<sup>st</sup> aid in place to help you both physically and mentally. If you are hurt, please inform the lab 1<sup>st</sup> aider for assistance and don't forget about your mind we are here to help you.

## Physical 1<sup>st</sup> aid and Mental health.

Andrew Moss – Room 6.10

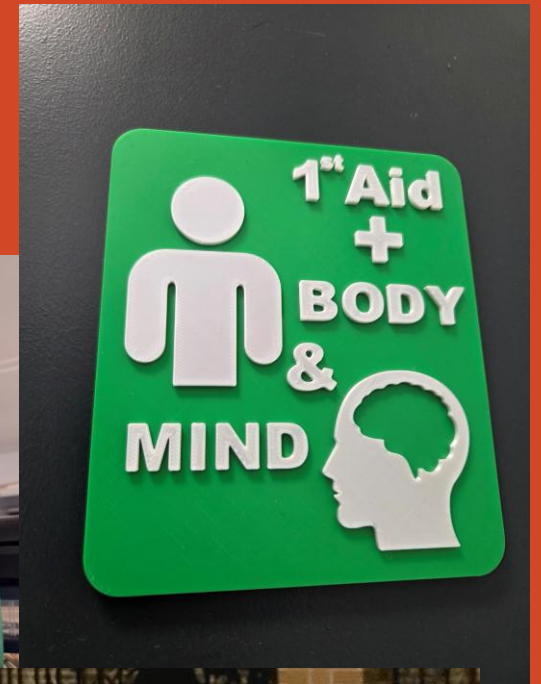
## Wellness Champion

Muhammad Omer- Room 6.10

## 1<sup>st</sup> Aid Kit

A fully stocked first aid kit is in the technician office containing plasters, bandages, eye wash, burn dressings, etc.

Unable to find assistance – Call 222 from a laboratory phone



# Fire and Evacuation

Fires have happened in the laboratory, and in the building. You need to know what to do and follow fire marshal instructions.

If a fire is present, you suspect a fire or fire alarm sounds

Do not tackle the fire.

Turn off kit if safe to do so.

Raise the alarm if needed.

Take the nearest fire escape route and assemble outside at the assembly point.

Unable to evacuate. If safe enter the Roberts building via the link bridge or seek safety in a refuge zone using the call point to notify an advisor.

## PEEPs

Do you have a PEEP, Please notify lab staff so arrangements can be made.

## Lab Fire Marshals

Andrew Moss – SFEM

Noordeen Marikkar – FEM

Muhammad Omer - FEM



# Using Lasers and AOR

Some projects and experiments require the use of lasers or AOR sources. This could be ether in fiber optic cables or in free space.

- 1 Precautions must be took when using light emitting sources.
- 2 Needs to be documented fully in the risk assessment. With a scope of work and possibly a laser risk assessment. You will need to stating type, model, maximum power, wavelength and how used.
- 5 When the source is in use signs must be displayed at the lab entrance warning other lab users.
- 4 If you are unsure about using lasers and light sources, contact the EEE laser safety officer.

Laser safety officer

Prof Cyril Renaud

Room 903 Roberts building

phone ext: 33982

**Work Safe With Lasers**

When working with lasers, always ensure a safe working environment for visitors, colleagues and yourself. Think before you act!

**1 NEVER LOOK INTO A LASER OR AT LASER LIGHT REFLECTIONS**  
Not everybody knows this! Ensure that you shield all beams and reflections. Remember, laser light can also be invisible or partial invisible.

**2 NEVER MAKE UNPLANNED MOVEMENTS**  
Don't lean down to adjust your equipment before it is safe. Don't bend down to pick up dropped items. Let them drop. Falling items can be replaced, your eyes cannot.

**3 NEVER CROSS AL LASER BEAM**  
Never cross a laser beam. Never face the exit of the laser. Use the mechanical shutter and turn off the Power to make safe passage.

**4 NEVER LEAVE A LASER RUNNING UNATTENDES**  
Before Leaving the facility Switch off the laser. Also be aware of Potential fire hazards.

**5 ALWAYS OBEY ACCESS RESTRICTIONS AND WARNING SIGNS**  
Observe and obey warning signs and warning lamps. Ask the operator if in doubt.

**6 ALWAYS USE THE CORRECT TYPE OF LASER SAFETY GOOGLES**  
Check that you use the correct type of laser safety goggles according to the laser classification.

**7 ALWAYS COMPLY WITH SAFETY REGULATIONS**  
Local, regional and national laser safety regulations apply. It is your responsibility to know and comply with these regulation.

**8 ALWAYS EDUCATE OTHERS**  
The laser operator is always responsible for other people's safety and laser safety education of others.

© 2011 BSAENGLER.COM

# Project trays

When performing a project or experiment you need to store your work and keep things tidy.

Trays are allocated to you, and you are responsible for the tray contents..

The trays come in different sizes depending on your needs (small, medium and large).

The trays must be stored in the secure cabinet, so your work remains safe.

The tray contains a bread board to get you started and a label which needs to be filled in and stuck on the front to identify your work.

The trays are only for your circuits and components. NOT cables and tools which are a share resource.

At the end of your project/experiment you are required to clear your tray. Hand back loaned equipment and pass on anything that needs saving.

Trays are periodically inspected and anything which should not be stored, or suspicious items will be removed.



# Making PCBS

During your project producing a pcb is very common. Martin Scott can fabricate pcbs in the PCB workshop.

Use the pcb web page or speak to martin about design constrains.

We use various methods to produce pcbs depending on application. Photo imaging and chemical etching , lasering engraving\cutting and drilling and routing to produce pcbs.

Before designing make sure the components are available.

PCBS can be rigid, flexible or highbred. Single sided, double sided or multi layered. Use SMD, through hole or mixed.

Lots of choices, lots of methods, the design is down to you.

## Information and design submission contact

Martin Scott

PCB Workshop - Location 6.10

[pcb-jobs@ee.ucl.ac.uk](mailto:pcb-jobs@ee.ucl.ac.uk)



# Soldering Area

Equipment is provided in a dedicated area of the project lab and offer different tooling to support all technologies along with microscopes for assembly and fume extraction

If you are unsure about soldering and require help, ask a technician to aid/teach you how to solder or use the equipment.

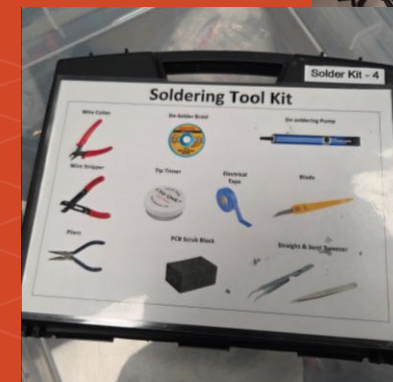
Soldering tool kits can be obtained from the technician office. When borrowing a soldering kit you are responsible for it and must return it once work complete.

Hand soldering irons with various soldering tips are provided for delicate smd work to large bits where high heat is required. Use the correct tip for the job otherwise the irons or your work can easily be damaged.

2 Reflow ovens are provided. A small oven for single boards and a large oven for batch processing.

Solder paste can be found in the fridge and will need to naturally warm to room temperature before use.

Please clean up after using the kit, return tooling, wipe up any solder paste / flux spills.



# 3D Printing

The lab has 4 3D printers to produce plastic parts for projects. The printers are filament based and the lab has a small stock of various colours and plastic materials.

## Materials

PLA, PLA Wood, PLE-CF, ABS, PTEG, TPU 95 and TPU 95HF. Other material can be used but will need purchasing

## Design

The 3D design should have no open nets and be saved as an STL or STEP file

Try to avoid over hangs.

Large models may need to be sliced or redesign into smaller parts for printing.

If you are unsure if a part can be printed or have design queries see a technician

The design should be sent to the print queue. [3dprinting@ee.ucl.ac.uk](mailto:3dprinting@ee.ucl.ac.uk)

## Workshop

For very complex design or parts the lab can not produce a high accuracy powder SLS printer is available in the EEE Workshop (620 Roberts).

See workshop staff Tom Hamer.



# Laser Cutting

A laser cutting service is available in the teaching lab for cutting/engraving/scoring sheets of material into shapes.

The device is a GlowForge Pro with Bofa fume extraction.

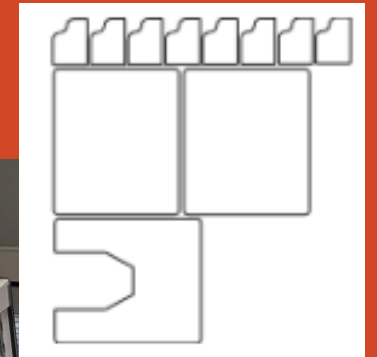
1. Default material is 1.5mm, 3mm and 6mm acrylic.
2. Other materials can be cut but you need to ask in advance as they may be flammable or emit harmful fumes/vapours when cut.
3. The design should be saved as a DXF or SVG. Other formats can be used at your own risk
4. The design must fit into a space of 270mm x 480mm maximum.

All laser cut jobs should be sent to [3dprinting@ee.ucl.ac.uk](mailto:3dprinting@ee.ucl.ac.uk)

## Workshop

For large panels and shapes which the lab can not produce a large laser cutter is available in the EEE Workshop (620 Roberts).

See workshop staff Tom Hamer.



# Toolbox

Building and testing circuits you will need hand tooling, cables probes, connectors, etc.

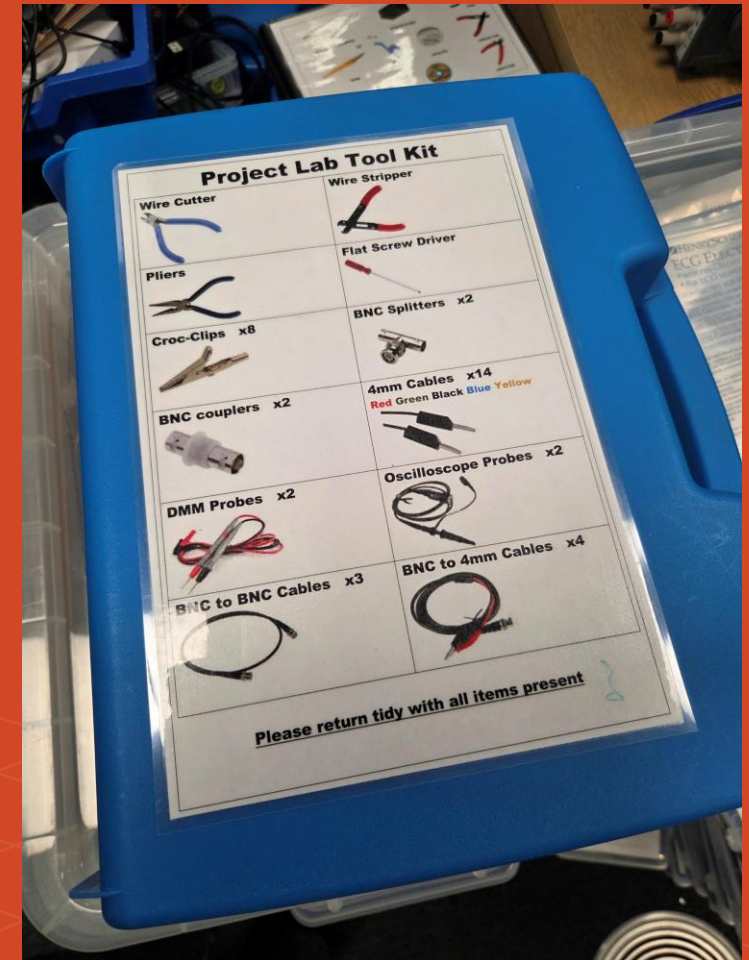
## Toolboxes

Toolboxes can be obtained from the technician's office.

These kits contain the most commonly used items such as pliers, cutters, bnc cables, 4mm leads, dmm probes, scope probes, croc clips, t-pieces and screw drivers, etc.

When you take a box, you need to sign it out and return it in a tidy condition.

When you sign out the kit you are responsible for the parts and its return.



# Tool Cabinet

Electronics and projects are not just about building circuits.

Various tools are available for you to use to make enclosures, build fixings and actuators, join things together, etc.

If you use any of the tools you are responsible for it and how you use it and must return after use

If you don't know how to use a tool, ask a technician for a demonstration.

## In the tool cabinets you have access to

screw drivers

Cutters

Pliers

Crimps

Hex keys

Spanners

Saws

Files

Tape

Cable

Heat shrink

Sleving

Screws\bolts

nuts\washers

Soldering sundries

PPE(gloves/glasses/etc) Drill\driver bits

Tap 'n' die kit

Crimp kits

Power drill

Heat gun

Rotary cutter

Battery Chargers

And more



# Chemicals, Solvents, etc

During your experiment or project there may be some kind of requirement for chemicals or the like. This could be things like acids, bases and reagents, custom solutions, etc or just day to day items like cleaning solutions, glues and lubricants.

All items require special handling and storage.

No chemistry or the like should be stored in your project tray.

A yellow metal cabinet for storing these items can be found in the project lab.

If you intend to use any glues, lubricants, solvents or chemicals you need to read and understand the COSHH / SDS information.

Make sure the area is suitable for its use.

Wear the appropriate PPE.

Have that information clearly documented in your risk assessment.

Any items you use from the lab cabinet are your responsibility and you must return them after use.

The cabinet contains things like, IPA, Acetone, Foam cleaner, Oil, Grease, Paint, Coatings, PCB conformal coating, Solder flux, Heat transfer compound, etc.



# Components and Ordering

A range of components are stocked in the in the teaching lab and lab office; a list of commonly used parts list can be found on the teach lab intranet.

It is difficult to predict what you require for your project so we only stock the most used components.

If there is sufficient demand for a component that is not stocked please let a technician know and we will investigate the prospect of stocking it.

If the components run low or are finished, please let us know so we can restock ASAP.

For one off or special items which you require for your project you will need to order them. This is done by using the collab web page.

Preferred suppliers of electronic products are listed on the next orders page. Orders placed normally take 2 to 3 days to arrive after approval.

<https://collab.ee.ucl.ac.uk/teachinglab/>

If you need components from other suppliers, ebay, amazon, etc you MUST speak with the technicians and have very specific reasons.

Please monitor Collab for messages about your order i.e problems and arrivals.

