

Central Teaching Laboratory Laboratory Manual

academic year 2023/24

Version 1



**The protocols outlined are subject to change.
Please ensure that you refer to the latest version of the manual.**

Important Safety Notices

There have been many changes to this manual in the last two academic years to help us deliver a secure environment to undertake practical work. We encourage all users of the CTL to review this document and ensure that they understand the changes we have introduced to try to keep us all safe.

You are expected to read and adhere to the lab safety behaviour outlined in this manual.

All accidents must be reported to the laboratory supervisor or technician who will take the necessary action.

You have a responsibility to report any unsafe behaviour to the laboratory staff so that they may take the appropriate action.

You must follow the instructions of the academic responsible for the lab at all times.

Failure to follow safety behaviour in any laboratory will lead to you being asked to leave the building.

All the laboratories have multiple uses and chemicals, bones, soil and other contaminants may have been used on the benches. Hence, under no circumstances is food or drink permitted in the laboratories or GFlex, including water and chewing gum. Anyone found eating or drinking (this includes having bottles/food on the bench) will be asked to leave the building.

TO CONTACT THE EMERGENCY SERVICES:

- **Using an internal telephone dial 2222**
 - **From a personal mobile dial
01517942222**

Evacuation of the CTL

If the fire alarm sounds, or you are asked to evacuate the building for any other reason:

- **If possible, turn off hot plates/water baths/gas** - but do not put yourself at risk
- **Leave the lab** - do not stop to collect personal belongings from lockers
- **Use the nearest fire stairwell (located at each end of the atrium and behind the lifts).**
- **You must follow the instructions of the fire wardens** as some potential exits may not be accessible due to the building work.
- **Doors on fire stairwells close automatically when the alarm sounds** - just push to open
- **You should also be able to leave the CTL through the doors to the lecture theatre block.**
- **Proceed to the ground floor and leave by the fire exit at the bottom of the stairs.** Do not enter the atrium unless told to do so
- **If you exit CTL within site hoarding, you must exit the compound via the nearest push bar gate.**
- **Wait on the Chadwick Building side of the tree-lined avenue, away from the CTL**
- **Do not re-enter the CTL until you are told it is safe to do so**

If you have a disability that would impede your evacuation of the lab, please inform a member of the technical staff.

Who we are and what the building provides

The CTL is designed to support specialist teaching in a variety of degree programmes including physics, earth and ocean sciences, geography, chemistry, and archaeology.

The ground floor primarily provides space, equipment, and technical expertise for physics-based practical work. The first floor provides space, equipment and technical expertise for the environmental sciences and archaeology practicals. The second floor provides space, equipment and technical expertise for chemistry-based practical work.

The computer room on the first floor is colour-coded denoting reserved areas as shown on your timetable. When not used for a teaching session the space is available for drop-in access. Please be aware that if you sit in a reserved area you will be asked to move. In addition, there is a small drop-in area (the purple zone) which is not timetabled. Networked printers suitable for scanning and for black and white and colour A4 and A3 printing are available on the first floor.

Social space is available on the ground floor and first floor atriums, and in the lecture theatre block adjacent to the CTL. Remember to be respectful to teaching activities and keep noise to a minimum

Building opening times and access arrangements

The laboratories in the CTL are usually open between 9.00am and 5.00pm. You can enter the laboratories on the ground floor via the entrance opposite the Chadwick Building, or through the Central Teaching Hub (ground or first floor). Please be ready to enter your laboratory on time and ready to start work.

Ad-hoc laboratory access for extension work or project work can sometimes be arranged through CTL staff. This will normally be on Wednesday afternoons.

There is access to laboratories **only** when academic staff or technical staff are available.

Please make sure that you are ready to leave the building at 5:00 pm, **no late working in the laboratories is possible.**

You must use the main entrance and the communal stairwell for access unless otherwise informed, or in the case of an emergency. During the course of academic year 2023/24 we expect repair work to be continued which may affect the normal entry and exit routes from the building. Alternative routes will be clearly signposted.

Lockers are available on all three floors for the use of students using CTL laboratories. Lockers should be left empty at night. **Keys must not** be taken out of the building.

Sustainability

CTL follow the Laboratory Efficiency Assessment Framework, LEAF, and currently hold silver status. We strive to make our labs as sustainable as possible and, last year, won the sustainability on campus award for our work reducing water usage in our chemistry labs. We currently recycle purple nitrile gloves, batteries and centrifuge tubes. This year we will be trialling a scheme to process and re-use some of our waste acetone. If you have any suggestions for sustainability improvements in the labs please speak to the technical team or contact ctlinfo@liverpool.ac.uk.

Expectations of behaviour

You are expected to read and adhere to all of the safety guidance provided in this manual as well as specific guidance provided for you particular laboratory class.

Please come to each session well prepared and ready to work. If available, read the lab script and complete any pre-lab exercises beforehand. If required for your course, please bring all necessary equipment with you, e.g. calculator, compass, hand lens, safety glasses.

If you are feeling unwell, please do not come to the labs.

All bags and coats should be left in the lockers provided.

Please wear appropriate shoes (flat shoes that cover your feet) and clothing (covering your legs and arms) for working in a laboratory, and for your own safety, have loose hair tied back. You should always wear any PPE as directed by the academic staff running your class.

On arrival at your laboratory please wait outside until told to enter.

Under no circumstances is food or drink permitted in any of the laboratories, including water and chewing gum. Anyone found eating or drinking (this includes having bottles/food on the bench) will be asked to leave.

Restricted use of mobile phones to support your learning is allowed in some laboratories depending on the activities in the lab. You must follow the rules set by the academic responsible for your laboratory class.

Academic staff and postgraduate demonstrators are in the laboratory to ensure that safe procedures are followed and to give help and advice. They will help if you are having difficulty setting up or using apparatus and discuss any questions you may have.

At the end of your practical session, your workspace should be both clean and tidy.

Always exercise common sense when in the laboratory.

What to do if you find a fire

In the event of you finding a fire warn others in the vicinity and leave the building by the nearest emergency exit. **DO NOT** enter other rooms or collect your belongings from lockers on your way out.

If it is safe to do so, please sound one of the alarms located at the emergency exits as you leave the building. If it is not safe to do so, contact the security via a mobile telephone (0151 794 2222) or from the nearest safe building (2222).

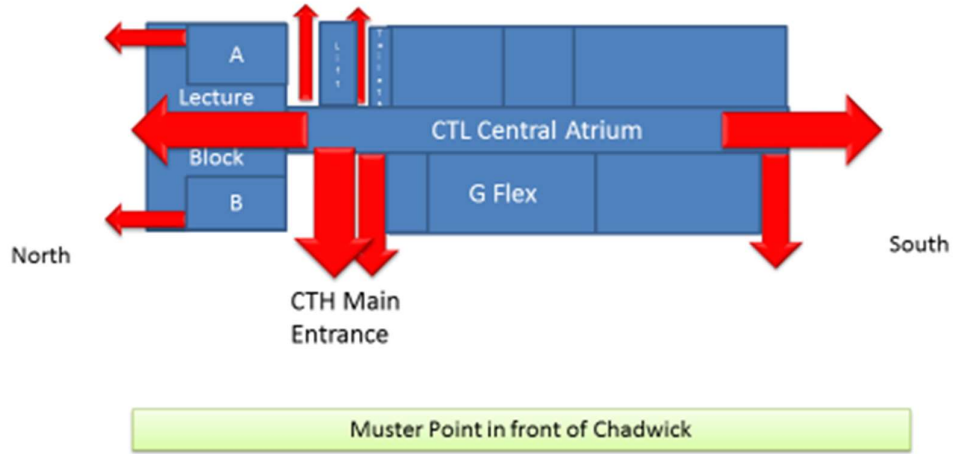
Go to the fire evacuation point – the tree-lined Avenue – and stand on the Chadwick Building side to listen for announcements made by the building manager or senior fire officer. The CTL staff will act as fire wardens and will be identified by high visibility jackets. If you raised the alarm, **YOU MUST** contact them **IMMEDIATELY** at the fire evacuation point with details of the fire.

Fire alarms: The fire alarms are connected to the lecture block. They are usually tested on a Wednesday at 8:30am. There will be 2 alarm tests, one for CTL and one for the lecture block and should last no more than 30secs per alarm.

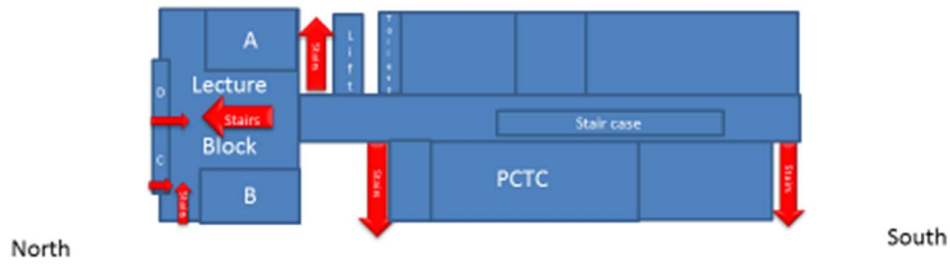
If there is a fire in the CTL building or the lecture block, the alarm will sound continuously and you should evacuate the building immediately by the nearest emergency exit and go to the fire evacuation point on Tree Lined Avenue and stand on the Chadwick Building side.

Fire Evacuation Routes

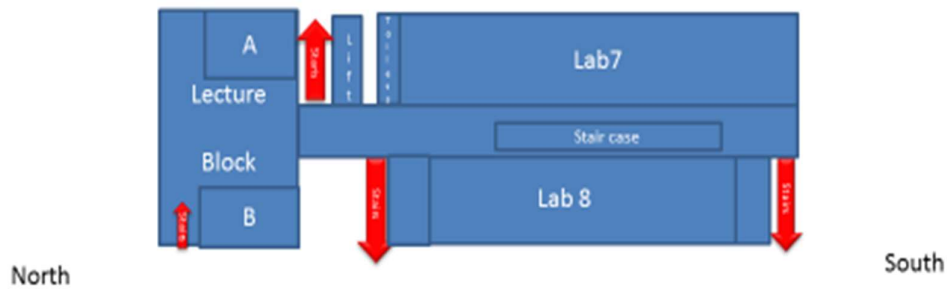
CTH Ground Floor



CTH 1st Floor



CTH 2nd Floor



GLOVE USE IN CTL



Ansell Alphatec Solvex 37-900 Reusable

These gloves can be washed and reused and must be used when:

- Working with ALL solvents.
- Working with conc. Acid/Base.
- When the COSHH indicates you should wear gloves, e.g. if the substance you are working with is toxic, corrosive, carcinogen, harmful or irritant.
- Performing activities that could have the potential for pressure build-up e.g. separations.

Kimtech Purple Nitrile Single Use

These gloves must be disposed of immediately after use:

- If you spill anything on the gloves you must replace them immediately
- Do not wear these gloves for an extended period
- Wear when preparing NMR samples, doing TLC or using UV lamps.
- Or when the COSHH indicates you should wear gloves e.g. irritant only.



Gloves should be worn when required for chemical protection identified by COSHH assessment

Gloves should only be worn for the specific activity, when handling chemicals, to reduce the chance of contamination and to keep the lab 'clean.'

Remove gloves before touching anything, e.g. skin, fume hood sash handles, mobile phones, paperwork etc. otherwise the contamination is being spread from the gloves to these areas.



Scilabub Frosters Cryogenic Glove

Cryogenic gloves for use when handling liquid nitrogen

Uvex Heat Resistant Gloves

Heat resistant gloves for use when using the ovens



GLOVE USE IN CTL

Accidents

Accidents and near misses **MUST** be reported to the senior laboratory technician or academic member of staff **IMMEDIATELY**. You may need to provide specific details, especially if an injury has been sustained.

What to do if you require first aid

Most of the technicians and many of the academics who work in the CTL have received training for first aid. If you, or a fellow student, require first aid support you should contact your nearest technician.

A defibrillator is housed in the building managers office on the ground floor.

Using Chemicals in the CTL

All chemicals used in the laboratories will have a COSHH record. They are available in the laboratories and where necessary you will be directed to them by academic and technical staff. You must understand and follow the COSHH assessment for any chemicals you use in the building. Any problems with the COSHH assessments should be referred to Cate Cropper (ccropper@liverpool.ac.uk) in the first instance.

Gloves

Protective gloves may be required for the handling of some chemicals, and also when handling cryogenics or hot glassware. The CTL has developed a set of criteria to help you decide which type of gloves to wear for which occasion. Remember to remove your gloves before you leave the laboratory, and for single use gloves remember to recycle them in the relevant purple bins.

Risk Assessments

In addition to a risk assessment for the building and for the individual laboratories, there must be a risk assessment for every experiment undertaken in the CTL. You may have to complete the risk assessment yourself or someone may have completed it for you. You must understand and follow the conditions identified in the relevant risk assessment for any activity you undertake in the building.

Safe Operating Procedures.

SOPs are provided for all of the equipment used in the laboratories. You must understand and follow the SOP for any of the equipment you use in the building.

As many of these have changed recently, it is important that refresh your understanding.

In particular

- Do not operate any apparatus unless you have been given permission to do so.
- Ask a member of academic staff, demonstrator or a laboratory technician if you are unsure about adequate handling of equipment or the correct experimental procedure.
- Leave the equipment and surrounding area in a clean and tidy state when you have finished your measurements.

Mobile phones

Within the CTL we have agreed that mobile phones may be used in the teaching labs with the following restrictions.

1. They should never be used at any workspace in which you are handling flammable or hazardous substances.
2. They should never be used when wearing protective gloves. If you need to wear gloves you must not use your phone.
3. They can be used to support engagement with activities on Canvas – such as demonstrating completion of pre-lab activities.
4. They can be used to confirm your attendance at a session.
5. They can be used to authenticate access to software.
6. They can be used for photographs of your experiment with the express permission of the academic in charge of your laboratory.
7. They can be used as a recording or monitoring device as part of an experiment with the express permission of the academic in charge of your laboratory.
8. They can be used to support your learning if this is specified as part of a student support plan.

At all other times you should make sure that your mobile phone is put away in a secure environment where it will not be a source of distraction.

The final arbiter on the use of mobile phones in a laboratory is the academic in charge of the class. You must follow their decisions.

In the unlikely event of an emergency in the lab, where a landline phone is unavailable, it may be necessary to make a call from a mobile to contact security / emergency services (0151 794 2222). Remember to remove your gloves!

Specific Guidance for the Ground floor Teaching Labs

If you are student and have any queries, please contact your module leader.

Staff should contact either Charlie Devlin (charlie.devlin@liverpool.ac.uk) or the relevant laboratory technician

- Large bags and outdoor coats should not be brought into the laboratories. They must be stored in the lockers in the Atrium.
- **Food and drink must never be brought into or consumed in the laboratory.**
- Earphones must not be worn in the laboratory. Mobile phones may only be used in the laboratory with the permission of the module leader.
- You should remain at your allocated bench space as much as possible and minimize your movement around the laboratory.
- Wear gloves when working with lead and wash your hands before leaving the lab to eat. Dispose of gloves in the correct bin.
- Do not touch any radioactive sources or remove them from the protective casing.
- All radioactive sources must be returned to and registered with the technician before you leave the laboratory. If an experiment is to be left overnight, you must make arrangements with the laboratory technicians.
- Remove all jewellery on your hands and wrists (especially rings, watches, bracelets) when working with lasers and other bright light sources.
- Beams and reflections from lasers should be contained within the edges of the bench. Ensure you use adequate shields to stop the beam.
- Use the torches or red light provided when moving around the dark room.
- Wear flat, closed toes shoes when working with cryogenics.
- Always wear appropriate gloves when handling hot or cold items such as cryogenics and hot glassware.
- You are required to follow all safety instructions in practical manuals and be aware of the risk assessment where this is provided.
- Any breakages or malfunction of equipment must be reported to the laboratory technician. Do not use any broken glassware or faulty equipment.
- You must report all accidents, however trivial, to a demonstrator or lab technician.

- You must keep your bench space and communal areas clean and tidy and free from spillages. Consult a demonstrator or laboratory technician in case of spills.
- At the end of the laboratory session, please return your workspace to how it was when you arrived and log off from PCs.

Specific guidance for the First floor Teaching Lab

If you are student and have any queries, please contact your module leader.

Staff should contact either Stephen Brough (stephen.brough@liverpool.ac.uk) or the relevant laboratory technician

- Large bags and outdoor coats should not be brought into the laboratories. They must be stored in the lockers in the Atrium.
- **Food and drink must never be brought into or consumed in the laboratory.**
- Earphones must not be worn in the laboratory. Mobile phones may only be used in the laboratory with the permission of the module leader.
- You are required to follow all safety instructions in practical manuals and be aware of the risk assessment where this is provided.
- You must keep your bench space and communal areas clean and tidy and free from spillages. Consult a demonstrator or laboratory technician in case of spills.
- You should remain at your allocated bench space as much as possible and minimize your movement around the laboratory.
- Any breakages or malfunction of equipment must be reported to the laboratory technician. Do not use any broken glassware or faulty equipment.
- You must report all accidents, however trivial, to a demonstrator or lab technician.
- Do not operate any equipment you are not familiar with. Ask a demonstrator if you are unsure about adequate handling of equipment or the correct experimental procedure.
- Always wear the correct gloves when handling potentially hazardous chemicals.
- Always consult a demonstrator or lab technician if you have any queries.

Specific Information for the Second floor Teaching labs

If you are student and have any queries, please contact your module leader.

Staff should contact either Cate Cropper (ccropper@liverpool.ac.uk) or the relevant laboratory technician

- A laboratory coat must be worn at all times in the second-floor laboratories.
- You must bring your own (clean) lab coat and safety glasses to each session. If you do not have a lab coat or safety glasses you will be turned away from the practical class.
- **Food and drink must never be brought into or consumed in the laboratory.**
- Earphones must not be worn in the laboratory. Mobile phones may only be brought into the laboratory with the permission of the module leader.
- You should remain at your allocated bench space as much as possible and minimize your movement around the laboratory.
- Lab scripts exist for each experiment. You are required to follow all safety instructions in these scripts.
- You must keep your bench space and communal areas clean and tidy and free from spillages. Consult a demonstrator in case of spilled chemicals and solutions.
- Any breakages of apparatus must be reported to the laboratory technician. Do not use any broken glassware or faulty apparatus.
- You must report all accidents, however trivial, to a demonstrator or lab technician.
- All storage containers for samples and chemicals must be properly and securely labelled. The label should be waterproof and must contain your name, the date and the name or structure of the compound.
- Experiments must not be left unattended unless specific arrangements have been made with the laboratory technician. If an experiment is to be left overnight, you must complete an overnight form.
- Do not operate any apparatus you are not familiar with. Ask a demonstrator if you are unsure about adequate handling of equipment or the correct experimental procedure.
- Always wear appropriate gloves when handling hot or cold items such as cryogenics and hot glassware.
- Always consult a demonstrator or lab technician if you have any queries.

A limited number of PCs are available on the 2nd floor for lab users to access. You must remove your lab coat and gloves before you sit down.

Contacts

Floor	Space Ref	Phone Number	Name	Room
Ground	G/019	(015179) 59721		Sick bay
Ground	G/020	07721849308	Stu Doran	Building manager
Ground	G/020	(015179) 59737	Steve Chappell	CTL Supervisor
Ground	G024	(015179) 58151	Marc Dunn	Radiation Lab
Ground	G/040	(015179) 59723	Patricio Vasquez-Aguilar	Electronics/optics lab
Ground	G/042			G Flex
Ground		(015179) 51003	Charlie Devlin	Lecturer
First	1/013	(015179) 59725		Archaeology inner lab
First	1/020	(015179) 59726	Sandra Collins	Environmental science tech base
First	1/011	(015179) 59724	Sabine Hiltcher	Environmental science tech base
First	1/029	(015179) 59738	Josh Hicks	PC teaching centre
First	1/030	(015179) 59736	Paul Fargin	PC teaching centre
First		(015179) 51001	Stephen Brough	Lecturer
Second	2/024	(015179) 59732	Ann Leyden	General lab
Second	2/011	(015179) 59739	Lynne Chapman	High service lab
Second	2/011	(015179) 59732	Liz Fisher	General Lab
Second	2/024	(015179) 59732	Christine Maloney	General lab
Second	2/011	(015179) 59739	Emma Coates	High Service Lab
Second		(015179) 51002	Cate Cropper	Lecturer

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- Using an internal telephone dial 2222
 - From a personal mobile dial
01517942222