

## **Faculty of Health and Medicine**

# **STUDENT SAFETY HANDBOOK**

This Student Safety Handbook or any updated version is valid for the entire duration of your association with the Faculty of Health and Medicine

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## SECTION 1

### INTRODUCTION

#### Safety Legislation

The Health and Safety at Work etc Act 1974 came into force on the 1st April 1975. This has extended the application of safety legislation to a wider range of employees, including teachers and others employed in the education service.

This act makes it clear that we all have a part to play in the health and safety at our place of work or study. It is the duty of all personnel and students to take reasonable steps to ensure the safety of themselves and anyone else who may be affected by what we do at work or in the course of our studies. Staff who supervise others have a responsibility for their subordinates and must set a good example. They are also responsible for the training of their subordinates so that hazards are understood and safety measures taken. The same relationship prevails between academic staff or demonstrators and the students they supervise for practical work.

The aim of this handbook is to promote safety awareness and draw attention to hazards most likely to occur. If you have chosen a science degree you are going to be subjected to hazardous areas which you will need to be prepared for, whether it is during a practical or on a field trip. Each and every discipline will have its own risks and hazards. Providing you possess a knowledge of the possible hazards and means of overcoming them, realise that safety calls for care and thoughtfulness from everyone and not just from those who have specific duties in this field, you have done all that is expected of you.

No attempt is made to describe all the possible hazards that could occur; the aim is to identify the main hazards and to suggest ways of dealing with them. This will allow students to work safely with the minimum of interference to their work.

Students who feel that any points are worth adding should contact the Area Safety Officer, their supervisor, or any other member of the Faculty Safety Committee, listed below.

The University's Manual of Safety contains detailed advice on many aspects of safety. In essence, this handbook should be read in conjunction with the University Manual of Safety, which can be found on <http://www.lancs.ac.uk/depts/safety/index.htm>

Any matters concerning safety should be brought to the attention of the Area Safety Officer, the Chairman of the FHM Safety Committee or the appropriate Representative. Repeated breaches of safety regulations will be brought to the attention of the Dean of FHM and may result in disciplinary action.

While this Handbook contains information on most of the activities you will undertake as a student, we cannot cover all eventualities, in particular related to dissertation work. For dissertations working with other hazards (e.g. ionising radiation), your supervisor should provide you with full safety information.



## First Aid

The following LEC/BLS personnel are trained in First Aid:

Building	Department	Room Number	Name	Tel No
Lancaster Environment Centre	LEC1	A28	Helen Quirk	92931
	LEC1	A18	Debbie Hurst	93133
	LEC1	B520	Brian Davison	93932
	LEC2	B59	Chris Jarvis	10213
	CEH	C42	Neil Mullinger	10231
	LEC3	A32	Marilyn Pooley	10244
	LEC3	A30	Ian Whyte	10242
	LEC3	B33	James Faulconbridge	10265
	LEC3	A 52	Judith Hunter	10182
Biomedical and Life Sciences	BLS	B Floor	Haydn Morris	93466
	BLS	B Floor	Sue Pritchard	93469/94817
	BLS	C17	Jackie Parry	93489/93530
	BLS	C12	Christine Shirras	94811

Other FHM personnel trained in First Aid:

Building	Department	Room Number	Name	Tel No
Faraday Building	Physics	A207	Steve Holden	93077
Physics Building	Division of Medicine	C65	Tom Fanshawe	93499
	Physics		Rob Henderson	93617
	Physics	A18	Shonah Ion	93650
	Physics	A507	Peter Livesley	93078
	Physics	A507	Ian Mercer	93078
	Physics	C29	Peter Tovee	0754089759
	Physics	A520	Martin Ward	93459
	Physics	C28	John Windsor	93640
	Physics		Robert Young	92339/07772312557
CETAD	CETAD		Tricia Kenny	93269
	CETAD		Hayley Connor	94854

The current list of all qualified First Aiders contact numbers is held by the University switchboard and listed in the Phone Book.

First Aid boxes are available in kitchen areas and most laboratories.

CETAD's and DHR's are in the general offices.

## **FACULTY SAFETY COMMITTEE**

Chair: Dean or nominee ( <i>ex officio</i> )	Dr G Brown
Secretary: Faculty Building and Safety Superintendent	Mr J Dwyer
BLS HoDiv or nominee ( <i>ex officio</i> )	Dr J Owen-Lynch
CETAD HoDiv or nominee ( <i>ex officio</i> )	Miss V Williams
DHR HoDiv or nominee ( <i>ex officio</i> )	Dr P Holland
Medicine HoDiv or nominee ( <i>ex officio</i> )	Dr H Lindsay
Senior Technical Support Manager/Chief Technician (Research)	Mr H Morris
BLS Radiation Officer	Mr H Latham
Biological Safety Officer	Dr M Roberts
SAPO Representative	Dr P McKean
Member of support staff (appointed)	Mrs B McMullen
Member of fixed-term contract research staff (appointed)	Dr S Morris
Postgraduate student representative	Miss M Gough
Minute Secretary (in attendance)	Mrs B McMullen

## **EMERGENCY PROCEDURES**

### **Fire**

Only use fire fighting equipment provided if trained to do so, do not take any personal risks. If your efforts are not immediately successful leave the building.

If the fire cannot be controlled, sound the fire alarm by breaking the nearest glass control. These are situated on exit routes. Ensure that everyone has left the room. If possible close all windows and doors.

Dial 999. Inform the security officer about the fire and its location (building, floor and room number). The fire service will be met and directed to the fire by staff from the Reception Building.

If you dial using a mobile phone you should also contact the security office tel: 01524 594541.

When the fire alarm sounds, it is mandatory that everyone must leave the building and assemble in the relevant assembly point listed below. Do not use the lift as an escape route.

If specific assistance is required and you wish to request a personal emergency evacuation plan (PEEP) contact the Area Safety Officer, Departmental Disability and Equality Officer or Student Services.

Ensure that the Area Safety Officer or other member of the Safety Committee is fully aware of the situation.

If fire extinguishers have been used, make a report to the Area Safety Officer

In the case of a fire, or fire drill, no person may use the lift.

DO NOT tackle the fire if there is any danger of being trapped. Remember that a 2-kg fire extinguisher will only last for approximately 40 seconds. Otherwise leave the situation to the Fire Service.

### **Assembly Points**

LEC/BLS Building	-	Library Avenue
Faraday Building	-	Physics Avenue
Physics Building Teaching Labs	-	Physics Avenue
CETAD		Bowland Avenue North

### **Serious Accidents**

Telephone 999 if possible from an internal telephone and inform the security officer. If an ambulance is needed give the location, floor and room. If you dial using a mobile phone you should also contact the security office tel: **01524 594541**.

If the accident involves ingestion or burns inform the emergency services.

If appropriate, take immediate remedial action:

- a) For chemical burns wash affected areas with cold water.
- b) For electrocution, switch off power, avoiding bodily contact with any live areas, including the casualty.
- c) Alert a person with First Aid training.

### **Accident reporting**

Any accident, no matter how trivial, must be reported to the lecturer or demonstrator who then reports to the Area Safety Officer, who will record it using an accident/incident report form. These forms are seen by the Head of Division who may make suggestions or actions to be taken to prevent reoccurrence. A signed copy is then sent to the University Safety Office and a copy kept in the Faculty.

## **ELECTRIAL EQUIPMENT**

Ref: Section 6. University Manual of Safety

The common-sense rules of handling electrical equipment should be adhered to, e.g. do not unplug mains plugs with wet hands; do not spill liquids onto electronic equipment; do not leave mains leads trailing across the work area etc.

On occasion, students may need to work with electrical equipment in the field, which presents a particular hazard. In these instances, you should be provided with full safety instructions from the staff member concerned.



## **External Teaching Venues**

External teaching venues may be used on occasions. Staff must satisfy themselves that health and safety practices are in place and that risks are identified and assessed based on the requirements of the group. You should be provided with a safety induction which will cover First Aid and Accident Reporting; Emergency Evacuation procedures and Fire Assembly Points. You should obey any site-specific safety requirements displayed and report any accidents to the venue Health & Safety representative, as well as your Lancaster University department representative.

## **Fieldwork which involves going out into the community and meeting people**

Fieldwork may include rural and urban areas, public open spaces, public buildings (libraries etc), and private commercial, industrial or domestic premises. Frequently such field work will involve no more risk than normal everyday life. However, all students and staff undertaking fieldwork in the Division of Health Research must explicitly assess any risks involved and take appropriate safety precautions. A risk assessment form should be completed for all fieldwork. This should be read in conjunction with your organisation's guidelines on lone working.

## **General safety precautions when conducting fieldwork**

The following general safety precautions and codes of behaviour apply to all research fieldwork.

- Be aware of the normal risks of working out of doors, including traffic, weather and other every-day hazards and take appropriate precautions.
- Act responsibly at all times.
- Try to avoid appearing out of place. Dress appropriately taking account of cultural norms. Equipment and valuable items should be kept out of sight.
- In multi-storey buildings, think about safety when choosing lifts or staircases.
- If you are in a situation where you feel threatened or unsafe immediately stop the fieldwork and remove yourself to a safer location.
- Treat people you contact with courtesy and respect, and do not get into an argument with respondents (no matter how much you disagree with their views).
- Always leave explicit details of where you are going and your expected time of return with someone who is in a position to act if necessary. Notify this person when you have returned from your fieldwork and agree with them that if they fail to hear from you by an agreed time they should alert the police.
- Normally, fieldwork should take place in locations in which you feel comfortable and to which you would readily go in everyday life. Where the nature of the enquiry requires work in any area in which you may feel unsafe, special precautions must be taken (see below) and field work must only be undertaken with explicit permission of a supervisor, project director, Area Safety Officer or the Head of Division (as appropriate).
- Ideally, fieldwork should not be undertaken alone. Where working alone is unavoidable special precautions must be taken (see below) and field work must only be undertaken

with explicit permission of a supervisor, project director, Area Safety officer or the Head of Division (as appropriate).

### **Specific types of field work**

In general terms fieldwork can be divided into four types, with different associated risks.

- 1) Observational fieldwork in public places. The general safety precautions outlined above should be sufficient.
- 2) Interviews conducted in public open spaces. The general safety precautions outlined above should normally be sufficient. Always ensure that you work in an open area in full view of other people.
- 3) Door to door interviews (not pre-arranged). These pose additional potential hazards and in addition to the general safety precautions the following guidelines should be adopted:
  - Do not enter a house or other premises. Conduct all interviews on the doorstep in a situation where you can remove yourself rapidly if necessary.
  - Do not interview late at night or during hours of darkness.
  - Do not get tempted to become involved in any personal problems a respondent may relate to you or you inadvertently come across. If you feel that you encounter a situation where intervention is necessary immediately remove yourself and call the appropriate emergency services.
  - Beware of dogs.
- 4) Pre-arranged interviews (or observations) with individuals in places of work and private dwellings. The general safety precautions should normally be sufficient but you should also adopt the following guidelines:
  - Be aware of and obey any site-specific safety requirements in offices, factories, farms etc.
  - Do not undertake pre-arranged interviews outside normal office hours when workplaces are empty.
  - When entering a private office be aware of exit routes and end the interview and remove yourself if at any time you feel threatened.
  - If interviewing in a private dwelling, stay in the communal rooms.  
Let the interviewee know that you have a schedule and that others know where you are. Stratagems include arranging for a colleague or taxi to collect you; making phone calls; arranging for calls to be made to you. Leave your mobile phone switched on, unlocked and within easy reach (not in a bag).

Further information and advice about safety and risk in fieldwork can be found here <http://www.lancs.ac.uk/researchethics/1-8-safetyrisk.html>

## **Occupational Health arrangements for Lancaster Medical Students**

Students following the Liverpool Medical curriculum will receive special instructions on their Health clearance and immunisations prior to starting at Lancaster, via the Lancaster Medical School office. These will include a Health Questionnaire and covering letter, and the details are in line with Medical Schools Council.

## **LABORATORY BASED STUDENTS ONLY – READ ON FROM HERE**

### **SPECIAL HEALTH PRECAUTIONS**

Because of contact with samples of soil, sediment, sewage, etc., it is probable that members of the Department, including students, run a risk of infection somewhat greater than that of the general public. **Immunisation against tetanus and polio is strongly advised. Consideration should also be given to Hepatitis A immunisation.**

#### **Hepatitis A**

The Hepatitis A virus is usually transmitted by the faecal-oral route through person to person spread or contaminated food or drink. Hepatitis A is not as dangerous as Hepatitis B; recovery is usually 6-8 weeks.

#### **Recommendation**

The level of risk will need to be reviewed on a project by project basis and if necessary Hepatitis A vaccinations can be arranged from the Occupational Health Department or individuals GPs.

#### **Hepatitis B**

The virus is transmitted from blood or body fluids that cross over the skin barrier, for example needle stick injuries, eye splashes. Members of staff or students working with human blood or body fluids should be offered the Hepatitis B vaccination. Please contact the Occupational Health Advisor, Angela Mackay-Fowler [a.mackay-fowler@lancaster.ac.uk](mailto:a.mackay-fowler@lancaster.ac.uk) ext.94624.

Attention is also drawn to an increased incidence in recent years of leptospirosis (Weil's disease), which can be fatal. Anyone is at risk who is exposed to rats, rat or cattle urine or to foetal fluids from cattle, which will include many members of the Department, especially those carrying out fieldwork. The following preventive measures are recommended, where risk of infection is significant: cover cuts and broken skin with waterproof plasters, wear protective clothing (especially waterproof gloves), wash your hands at the completion of work and before eating, drinking and smoking and use antibacterial hand sanitisers. Early symptoms are flu-like muscle pains, vomiting and a persistent severe headache. If you are at risk and develop these symptoms seek medical advice as soon as possible.

#### **Placement Students**

Students registered on Biomedical Sciences programmes who expect to go on a hospital placement during their degree will be required to have a Hep B vaccination, prior to their placement, along with other health surveillance.

There is a separate policy dealing with student placements which will be discussed in more detail nearer the time if chosen for a placement.

## **GENERAL INSTRUCTIONS CONCERNING SAFETY IN SCIENCE LABORATORIES INCLUDING PRACTICAL CLASSES**

Wearing of a laboratory coat is compulsory.

These can be purchased during Fresher's week or from the laboratory technicians in B1 or B2 laboratory in the Faraday building.

If a class 2 Pathogen is being used, you will be provided with a disposable apron to wear over the lab coat to prevent contamination of the coats.

If you suspect that a coat has been contaminated, leave it with a member of staff giving them your name, so that it can be autoclaved, to render it safe for use.

Ensure that contaminated tips and pipettes etc are placed in the correct receptacles in Disinfectant and not on the bench.

Ensure that you swab the bench down with disinfectant before the next user.

**It is forbidden** to smoke, eat, chew gum, drink or apply cosmetics in a laboratory or associated areas.

Turn off mobile phones whilst working in the laboratory, use for emergency contact only

Laptops must be used in dry space only; otherwise the laptop is liable to contamination from material on the laboratory bench and would be required to be decontaminated before leaving the premises.

Long hair must be tied back, to prevent it catching fire when using Bunsen burners, or getting it tangled with whirlmixers etc. Also it could get contaminated from bacterial cultures or chemicals.

**It is forbidden** to work in the laboratories under the influence of alcohol or drugs. Students suspected of being under the influence of drugs or alcohol will be asked to leave the laboratory.

Members of the Division must not allow young children to enter laboratories or workshops; also pets must not be taken into laboratories and workshops.

Casual visitors are to be discouraged, including other students who are not registered for the course.

**It is strictly forbidden** to run in corridors or laboratories, or behave in any manner which is liable to cause accidents.

Do not allow trailing electrical cables or equipment to project over a bench or shelf.

Do not obstruct corridors, gangways or exits.

Never pipette by mouth.

All working areas should be tidily maintained. Danger can result from untidiness.

Always wash your hands when finishing work in the laboratory in the designated hand wash sinks only.

Suitable footwear must be worn when working in laboratories. Shoes must be closed and with a low heel. Sandals, flip-flops or similar footwear are not acceptable as they are a slipping and tripping hazard. Also your feet will not be protected from anything dropping onto them, such as a spillage.

Spillages must be cleared off the bench or mopped up immediately; wet floors can be dangerous. Broken glass should be cleaned up immediately and placed in a bin labelled BROKEN GLASS ONLY.

In the event of a chemical spillage, seek assistance from the staff member present. The COSHH assessment details the spillage procedure for specific chemicals.

Specific spill kits are available in wet chemistry and microbiological laboratories.

Bottles and other containers should be clearly labelled with the name of the user, the contents and a hazard pictogram if necessary. Otherwise they will be removed and discarded.

Familiarise yourself with the position and operation of fire alarms, fire extinguishers, fire blankets, first aid boxes and emergency escape routes (lifts must not be used). Fire doors must be kept closed and not wedged open. When closed they effectively reduce the spread of fire, smoke and dangerous fumes. Do not obstruct fire exit routes, hoses or extinguishers.

Report any defects in apparatus or services to the appropriate technician, your supervisor or to a member of the FHM Safety Committee.

Always remember that your carelessness can result in injury not only to yourself but also to other persons.

### **SPECIFIC INSTRUCTIONS CONCERNING SAFETY IN SCIENCE LABORATORIES**

Potentially dangerous experiments may only be undertaken when there is another person in the vicinity, or within call, who is aware of the hazards and has appropriate experience. If you have any doubts about a possibly hazardous experiment, consult someone in the Division who has expertise in the area concerned.

Chemical reactions and manipulations present risks. In the vast majority of cases these risks can be reduced by the use of approved techniques.

The Control of Substances Hazardous to Health (COSHH) Regulations covers ALL activities involving potential chemical and microbiological hazards and affects a wide range of the activities in the Faculty.

COSHH Assessments must be carried out before any work is commenced involving potential chemical or microbiological hazards. The Regulations cover field work as well as lab work, and are not restricted to purely "chemical" or "microbiological" studies e.g. the use of a tracer in a dispersion experiment is covered by COSHH. If in any doubt as to what is covered seek advice.

COSHH Assessments for students are incorporated into practical and fieldwork schedules for normal coursework but must be discussed with supervisors in the case of project work. It is the legal duty of all members of the Faculty to make full and proper use of the control measures provided. You are also required to report any defects with the control measures (i.e. to the staff member in charge or to the Area Safety Officer). If you have any doubts about a reaction, substance or procedure, consult someone in the Faculty who has expertise in the area concerned.

Always remember that your carelessness can result in injury not only to yourself but also to other persons.

Always wear safety glasses and disposable gloves when issued. Always wear safety glasses/goggles when using compressed air or vacuum.

Wear eye protection when manipulating acids and concentrated alkalis. They both have a very strong corrosive action.

Apparatus should be examined each time you use it, to check for signs of broken plugs, or bare cables. Never touch a plug or electrical appliance with wet hands. When you have finished the practical you should switch the equipment off.

Electric cables should not trail over the edge of a bench. Check the Portable appliance sticker on the plug and equipment, if it's out of date, tell a member of staff.

Most solvents are flammable and should not be used near a naked flame.

When using a Bunsen burner keep benches clear of flammable items, and ensure that hair is tied back. Bunsen burners should be adjusted to show a yellow flame when not in use.

Do not stretch across a naked flame. They should be positioned carefully to avoid igniting flammable items in the vicinity. Do not meddle with gas taps.

When transporting large bottles of liquids from one location to another, a purpose-designed carrier or trolley must be used.

The University has a specific policy on waste disposal. Waste organic solvents must not be poured down the laboratory or fume cupboard sinks and should be put into the containers provided in each laboratory. Note that chlorinated hydrocarbon solvents should be placed in special separate containers. Solid chemical waste bins and glass waste bins are also available.

Never use volatile toxic materials outside a fume hood.

Ensure that at any time, potentially hazardous work is not undertaken except in the presence of another responsible person.

No one must work alone on hazardous experiments unless assistance is within calling distance.

Emergency showers are clearly labelled on laboratory doors. In the case of severe bodily contamination with chemicals, use one of these drench showers, or safety stations (which are dual shower and Eye wash irrigation units) situated in:

A Floor – A19, A20, A27, A28  
All B Floor labs  
All C floor labs  
Faraday - B1 and B2

In less serious cases, wash thoroughly with tap water and, if necessary, soap. Remove contaminated clothing.

In the case of eye contamination, irrigate eye with water for at least 10 minutes using eye irrigation hose or sterile eye wash liquid. If necessary, gently prise eyelids open. Seek immediate medical advice

Experimental work performed by students on taught courses in a laboratory must be under the direct supervision of a member of staff.

Students are not permitted to handle gas cylinders and associated accessories, or dispense cryogenic liquids i.e. liquid nitrogen

No dissertation or project work can take place until a Risk Assessment has been carried out and categorised under the University regulations. Specific Health and Safety guidance will be given at the planning stage in conjunction with your supervisor.

Students are not permitted to handle Radio-isotopes, or UV sources, unless under strict supervision and a risk assessment has been carried out.

Students are not permitted to drive Divisional vehicles or minibuses, unless they are over 25 years of age and have received specific training to enable them to do so.

#### **Waste Disposal - As per the COSHH assessment**

The University has a specific policy on waste disposal. As a general rule dilute acids and bases can be washed down the fume cupboard sinks with plenty of flushing. Waste organic solvents **must not** be poured down the laboratory or fume cupboard sinks and should be put into the containers provided in each laboratory. Note that chlorinated hydrocarbon solvents should be placed in special separate containers. Permitted solid chemical waste can be disposed of in solid chemical waste bins. Broken glass bins are also available. Microbiological hazards including body fluids, sewage, sludge etc. must be autoclaved before disposal and requires special disposal procedures.

These rules shall apply to all laboratories designated as science laboratories by the Faculty Safety Committee.

Anyone who is considered to be acting in a manner that puts themselves or others in danger will be prevented from continuing laboratory activities.

### **USING A FUME CUPBOARD SAFELY**

Before using a fume cupboard, bottles and other items should be removed. Items, which are not required, can interfere with the Face Velocity, causing problems with the extraction.

Check that the fume cupboard is switched on and that the motor is running (do not simply rely on the fact that the lights are on, as they are on a separate circuit).

The fume cupboards in this Faculty have 2 warning lights, one for the airflow and the other for the sash height. Both green lights should be lit and the audible alarm should not be sounding. Never assume that an alarm indication is false.

It is important to respect the mark that indicates the maximum sash opening. The maximum height should 400mm. If the sash is lowered substantially from this position enough room must be left for equipment to be manipulated and operated safely. Always avoid large uncontrolled releases of toxic vapours. Proper eye protection should be worn - the sash should not be regarded as sufficient protection for eyes.

When the sash is at its maximum height for normal work, the minimum air velocity into the opening below it (the face velocity) should be at least 0.3 m/s. higher velocities reduce the effects of movements of the operator on the airflow but can make Bunsen flames unstable. The average face velocity should be 0.45 m/s.

Work should be performed at least 150mm inside the fume cupboard.

Work on shallow trays if possible.

Any electrical cables should feed under the sill.

Any spillages should be cleaned immediately and waste should be disposed of via the appropriate route.

Any faults should be reported to the member of academic staff or demonstrator immediately.

Never leave any potentially hazardous process unattended and avoid obstructing the area in front of the fume cupboard.

Do not use naked flames inside the fume cupboard unless absolutely necessary (there must be no flammable materials present) and do not leave unattended

Also avoid sitting at the fume cupboard, and do not allow loose materials to be sucked into the extract system.

The colour code for the taps on the side is yellow for gas, blue for compressed air and green for water. Do not turn these taps on unless you require them.



## **RULES CONCERNING USE OF EQUIPMENT**

Experimental work performed by students using specific equipment and specialist apparatus must be under the direct supervision of a member of staff.

### **Specific Examples:**

#### **Ultraviolet Lamps (including hollow cathode lamps)**

Never look at an unscreened short wavelength (< 300 nm) UV source since the radiation can cause considerable corneal damage. This precaution should be observed even when using the small lamps which are used to examine TLC plates. Protective goggles are available when such lamps are used. Note, however that prolonged skin contact (only a few minutes in the case of high intensity lamps) can burn the skin.

#### **Gas Cylinders**

Gas cylinders are used extensively throughout the Faculty. Students should never touch them.

#### **Refrigerators, Incubators and Fume Cupboards**

All containers placed in refrigerators, incubators and fume cupboards must be stopper and labelled with owner's name, date and contents. Containers not meeting these requirements will be removed. Refrigerators in laboratories must not be used for storing food or drink. Fridges used for storing flammables must have a spark proof thermostat.

#### **Ovens**

Unventilated electric ovens and those with exposed heating elements must not be used for evaporation of organic solvents or drying deposits of crystals.

#### **Autoclaves**

The person designated for the training, and who has responsibility for the use of the autoclaves is Phil Nott.

Any person wishing to use an autoclave, MUST undergo instruction by Phil Nott, who will give you a copy of Standard Operating Procedures, and will complete a competency form to signify that you are able competent to use the autoclaves.

#### **Centrifuges**

Full training must be given before operating a centrifuge. The most hazardous aspect of the centrifuge is the rotation assembly. The most common type of centrifuge accident results from a failure to balance the load, or to use the trunnion buckets correctly. If the centrifuge rotor is poorly balanced and there is no strong barrier, debris can be ejected.

#### **Other Hazards**

Apparatus should be examined before use; if any damage to plugs etc. report immediately to your supervisor or a member of the technical staff.

Laboratories contain numerous other mechanical hazards. You should never touch equipment unless specifically instructed to do so by a member of staff, and when doing so follow the instructions exactly.

### **Microbiological Hazards**

Ref: Section 9. University Manual of Safety

The COSHH Regulations now include Biological Agents, which has embodied the recommendations of the Advisory Committee on Dangerous Pathogens (ACDP).

The category of Biological Agents which also includes the Genetic Modified Organisms now has 4 groups according to the hazard and containment.

They are as follows;

**Group 1:** A biological agent that is unlikely to cause human disease

**Group 2:** A biological agent that can cause human disease and which might be a hazard to employees. It is unlikely to spread to the community and there is usually effective prophylaxis or effective treatment is available. (E.g. Staph. aureus; food-poisoning bacteria.)

**Group 3:** A biological agent that can cause severe human disease and presents a serious hazard to employees; it may present a risk of spreading to the community but there is usually effective prophylaxis or effective treatment available. (E.g. TB; typhoid fever, (Salmonella typhi))

**Group 4:** A biological agent that can cause severe human disease and is a serious hazard to employees; it is likely to spread to the community and there is usually NO effective prophylaxis or effective treatment available e.g. Rabies, Ebola fever.

### **DISINFECTION**

Disinfection is commonly used where sterilisation is considered to be unnecessary, or impractical, e.g. due to the size of the object, or because it may be damaged by sterilisation. Disinfection is not an alternative to sterilisation. Sterilisation processes (e.g. steam sterilisation) are superior to chemical disinfection processes because their effectiveness can be checked.

Disinfectants do not necessarily kill all biological agents and do not usually destroy bacterial spores.

The main use of disinfectants in the laboratory is to ensure that equipment and the environment are decontaminated and safe to handle. Microbial contaminants on hands are readily removed by washing with soap or detergent. Hand decontamination should be performed after all laboratory work, even when gloves have been worn.

### **Disinfectant Usage**

- Waste materials, which need to be 'made safe', prior to being autoclaved
- Equipment which needs to be decontaminated and either cannot be autoclaved or is inconvenient to do so.
- Work surfaces, as part of general housekeeping, and Hygiene

- Spillages, both small and large.

Decon and other detergents agents are NOT disinfectants and should not be used for disinfection purposes.

### **General Laboratory Disinfection**

Use 2% Trigene from concentrate to wash down benches, disinfect laboratory equipment (e.g. centrifuge buckets) and deep clean microbiological safety cabinets, fridges and freezers, and any other equipment. Due to its non corrosive properties Trigene can be used for all equipment.

All work surfaces should be disinfected routinely on a daily basis, before commencing and finishing work with 2% Trigene solution.

Contact time for normal use is 5 minutes on a clean surface, 10 – 15 minutes for heavily soiled surfaces.

### **Experimental Material**

As a general rule, plates should be collected in autoclave bags and autoclaved. Discarded liquid cultures should be made up to 5% Trigene.

Remember that, as with all disinfectants, over dilution will make Trigene ineffective. After treating for 1 hour, liquid material can be discarded to the drains. Disposable plastic ware should be disposed of as normal waste.

Small volumes of low risk human blood (and other body fluids) should also be made up to 10% dilution and treated for at least 30 minutes, before being discarded to the drains. Consult the Area Safety Officer first if you need to dispose of large volumes of blood.

Blood from high risk groups must be discarded via the clinical waste system - consult the Area Safety Officer.

### **EXPLOSIONS AND FIRE HAZARDS**

**Bench Fires:** Evacuation of persons must take the highest priority, but if the fire is very small inform a member of staff immediately.

Switch off the gas supply to the Bunsen burners and other heat sources e.g., furnaces. If liquid is burning in a container such as a beaker, it should be left to burn away or smothered with a fire blanket; and then a fire extinguisher may be used to complete extinction if necessary. Care should be taken when using an extinguisher. It is easy to spread the fire by knocking over the beaker; therefore the extinguisher should be directed away from the fire and then cautiously brought near it.

**Hair on Fire:** Smother with a damp cloth

**Clothing on Fire:** Push the casualty to the ground with the flames on top. Smother the flames by spreading a fire blanket on top of the flames.

**Organic Solvents:** Organic solvents are a particular hazard; most organic liquids are very flammable and their vapours form explosive mixtures with air. Solvents should never be used in the presence of a naked flame, and should be stored and disposed of as instructed.

## **ENVIRONMENTAL FIELDWORK**

Ref: Section 21. University Manual of Safety

### **Definition of Fieldwork**

Fieldwork is defined as any practical work carried out by staff or students of the University for the purpose of teaching and research in places which are not under University control but where the University is responsible for the safety of its staff and students and others exposed to their activities. The definition includes activities as diverse as archaeological digs, social survey interviews as well as more recognised survey/collection work. Voluntary and leisure activities are excluded.

The Faculty has a specific policy for field work safety, based upon the requirement for the supervisor to first prepare Fieldwork Safety and Risk Assessment forms. Staff leading parties must take into account the safety requirements appropriate to the work they propose. In general all student and staff members of the Faculty engaged individually or in groups on field work should adopt the following procedures and recommendations. The academic supervisor must prepare a written scheme of work to be followed for each fieldwork activity. This will form an integral part of the risk assessment procedure. Copies of the completed Fieldwork Safety and Risk Assessment forms should be deposited with the ASO John Dwyer room C35 and copies retained by the academic supervisor and field worker. The academic supervisor should discuss the relevant hazards with the field worker(s) and should provide a written account of the identified hazards and precautions. Fieldwork, in this context, is defined as all work activities outside of the Faculty's buildings or vehicles.

**Before engaging in ANY fieldwork it is essential that a Fieldwork Safety and a Risk Assessment form is completed by the academic supervisor.**

### **General Considerations**

Students with any medical condition likely to affect their ability to undertake fieldwork must inform in advance the member of staff in charge.

As a general rule, field work by solitary individuals is not allowed. Exceptions to this rule may be permissible if the nature of the risks, degree of isolation, nature of the location and experience of the person involved allow. In practice, undergraduates and MSc students should only carry out fieldwork alone in exceptional, low risk, circumstances.

Do not go into the field without leaving contact details with a designated member of staff and preferably a map showing expected location and time of return. Be careful to report to this person on completion of work. Never carelessly break arrangements to report your return.

Students are only permitted to use their own vehicles for University related work (e.g. afternoon field trips, residential field courses) under exceptional circumstances. In the case of exceptional circumstances, the student must provide documentary evidence of adequate insurance (i.e. full business cover) and make a written case to the Area Safety Officer.

### **Field Course Safety**

Fieldwork should not be carried out by solitary individuals.

Individual field courses will have specific safety information depending on the nature of the activity.

Environmental fieldwork is an activity involving some inherent special risks and hazards, e.g. in coastal exposed areas, quarries, mines, river-sections, and mountains. Severe or dangerous weather conditions may also be encountered at any season, especially on mountains or the coast.

In accordance with the Health & Safety at Work Act, leaders are required to carry out a full Risk Assessment of the planned field work. You should receive specific instructions from your fieldwork leader prior to the start of the field trip. In some circumstances (e.g. dissertations), you may be involved in preparing this Risk Assessment.

The potential dangers of fieldwork make it imperative that students should cooperate by behaving responsibly in order to reduce the risk of accidents. Each individual is responsible for his or her own safety.

### **You are specifically asked to:**

- a) Observe all safety instructions given by party leaders or supervisors. Anyone not conforming to the standards required may be dismissed from the field course.
- b) Stay with the party, except by clear arrangement with the leaders. Assemble where requested (e.g. outside a quarry) in order to receive specific instructions regarding likely hazards. Observe instructions for reporting after completion of work.
- c) Report any injury or illness.
- d) Wear adequate clothing and footwear for the type of weather and terrain likely to be encountered. Shirt, loose-fitting trousers, warm sweater, brightly-coloured anorak with hood, is normally desirable in the U.K. A woollen hat (in addition to the hood of the anorak) is useful in winter or on high ground. Cagoule and waterproof over-trousers are desirable for wet weather. Jeans are generally unsuitable because they do not give sufficient protection when wet and subjected to a cold wind, but can be acceptable if waterproof over-trousers are also worn.
- e) Walking boots with rubber mountaineering soles are normally essential. Sports shoes are unsuitable for mountains, quarries and rough country. Wellingtons are generally best reserved for walking through shallow water, peat bogs and the like.
- f) Leaders may refuse to allow ill-equipped students on their field courses, since they have a responsibility to see that students observe the provisions regarding personal safety.

- g) Wear a safety helmet when visiting old quarries, cliffs, scree slopes, caves etc., or wherever there is a risk from falling objects. It is obligatory to do so when visiting working quarries, mines and building sites.
- h) Wear safety goggles (or safety glasses with plastic lenses) for protection against flying splinters when hammering rocks or chisels. Do not use one geological hammer as a chisel and hammer it with another; use only a soft steel chisel.
- i) Avoid hammering near another person, or looking towards another person hammering.
- j) Take special care near the edges of cliffs and quarries, or any other steep or sheer faces, particularly in gusting winds. Ensure that rocks above are safe before venturing below. Quarries with rock faces loosened by explosives are especially dangerous.
- k) Avoid working under an unstable overhang. Avoid loosening rocks on steep slopes. Do not work directly above or below another person.
- l) Never roll rocks down slopes or over cliffs for amusement.
- m) Do not run down steep slopes.
- n) Beware of landslides and mudflows occurring on clay cliffs and in clay-pits, or rockfalls from any cliffs.
- o) Avoid touching any machinery or equipment in quarries, mines, building or construction sites.
- p) Never pick up explosives, or detonators from rock piles; if found, inform the management immediately.
- q) Comply with safety rules, blast warning procedures, and any instructions given by officials.
- r) Keep a sharp look-out for moving vehicles etc.
- s) Beware of sludge lagoons.
- t) Do not climb cliffs, rock faces or crags, unless this has been approved as an essential part of the work.
- u) Take great care when walking or climbing over slippery rocks below high water mark on rocky shores.
- v) More accidents to geologists, including fatalities, occur along rocky shorelines than anywhere else.
- w) Beware of traffic when examining road cuttings.
- x) Avoid hammering, and do not leave rock debris on the roadway or verges.
- y) Railway cuttings and motorways are not open to geologists, unless special permission has been obtained from the appropriate authorities.
- z) Do not enter old mine workings or cave systems unless it has been approved as an essential part of the work. Only do so then by arrangement, with proper lighting and headgear, and never alone. Ensure that someone on the surface knows your location and expected time of return. Be sure to report after returning.

**Code of Conduct**

People engaged in field work must observe the following:

- a) Do not disturb the environment more than is absolutely necessary and always consider alternative ways of obtaining your information so as to minimise your impact.
- b) Never sample or pick more than is necessary.
- c) Never casually hammer outcrops - there is normally enough fresh debris lying around for identification.
- d) Never disturb living communities of plants or animals, even to the extent of avoiding turning over boulders in streams, beaches, etc.
- e) Always ask permission of a landowner or occupier for access to an area. Do not interfere with machinery, climb over walls, leave gates open, trample crops or disturb animals.
- f) Make no undue noise and leave no litter - do not be tempted to try and hide it under rocks etc., as it will always reappear.

**FIRST AID TRAINING**

Undergraduate and Master students undertaking independent fieldwork (independent field work is NOT lone working but without an accompanying member of staff) are required to attend a one day First Aid training course before commencement of the proposed fieldwork activity.

**NEW AND EXPECTANT MOTHERS**

**You must inform the Area Safety Officer at the earliest opportunity, of finding out you are pregnant. This is so a risk assessment is carried out, of any hazardous work. Any discussions will be completely confidential.**

A HSE guide for New and Expectant Mothers who Work is available following this link: <http://www.hse.gov.uk/pubns/indg373.pdf> in this guide is a flow chart that must be followed as it is essential for both the health of yourself and the unborn child. It is important to note that the unborn child is more susceptible to potential hazards.

**FACILITIES WITHIN OTHER DEPARTMENTS**

Persons using facilities and equipment from or within other departments and all borrowed/hired equipment etc. must be familiar with and comply with that departments safety regulations. Specific guidance should be sought about unfamiliar pieces of equipment, in particular any specific safety issues.

## **SECTION 2**

### **SPECIFIC INSTRUCTIONS FOR LABORATORY UNDERGRADUATE AND MASTERS PROJECTS AND DISSERTATIONS**

#### **Health and Safety Responsibilities of Supervisors towards Postgraduate and Undergraduate Students.**

In 1989, the CVCP issued a note of guidance on responsibilities of supervisors following an accident in a laboratory. This guidance relates to task supervision for health and safety and is not directly concerned with academic supervision.

#### **The guidance**

Universities have a legal duty to provide such supervision as is necessary to ensure the health and safety of both postgraduate and undergraduate students. When dealing with postgraduate students, it is important to understand that relying solely upon a student's status or competence cannot discharge this duty.

Responsible staff must be able to demonstrate that they have exercised a supervisory role, within the systems of work and monitoring arrangements.

#### **Risk Assessment and levels of supervision**

No dissertation or project work can take place until a Risk Assessment has been carried out. Specific Health and Safety guidance will be given at the planning stage in conjunction with your supervisor. Full operating instruction will be given in the use of relevant laboratory equipment e.g. pipettes, centrifuges, autoclaves analytical instrumentation.

No work to be carried out in any laboratory without authorisation from the supervisor in charge.

#### **STUDENT PROJECTS**

The project must be properly assessed and the supervisor must satisfy himself that safe working practices are in place and recorded by a written risk assessment, which must incorporate local rules as well as the health and safety regulations. Unless of course that the risk are not significant.

Any precautions, which may be necessary, are agreed between the supervisor and student and recorded. The supervisor to ensure that the student is following the agreed procedures carries out regular checks. Any alterations must be mutual agreement and recorded. Following this constant supervision is not required, and an authorised nominee can be appointed, who is a suitably qualified member of academic staff or technical staff.



## **LABORATORY SAFETY INDUCTION**

Laboratory work is varied and this often necessitates the use of specialist chemicals, materials and equipment specific to the area of research. Supervisors must be aware that laboratory inductions including COSHH and Risk Assessments must be carried out by themselves or designated personnel before any experimental work can be undertaken.

## **TRAINING RECORD PLAN**

Training in laboratory techniques, use of chemicals, materials and equipment will be provided by the supervisor or designated personnel. This will depend on the individual project; direct supervision should continue until the supervisor is satisfied as to competency. Supervisors will indicate the training requirements using a recording log and ensure that this training is completed before commencement of experimental procedures. It is the responsibility of the supervisor to ensure that these records are kept up to date and individuals are aware of the safety implications, plus the importance of such training.

## **OUTLINE OF COSHH PROCEDURES – Dissertation and Projects**

Ref: Section 9. University Manual of Safety

No work involving potential chemical and microbiological hazards can be carried out until a COSHH Assessment is completed and implemented. COSHH requirements for undergraduates, MSc./MRes. Students are incorporated into practical and fieldwork schedules for normal coursework, but specific COSHH Assessments may be required for project and dissertation work. Postgraduates may complete the assessment in conjunction with their supervisor; this assessment must also be approved and countersigned by the academic supervisor.

## **RESTRICTED ACCESS**

Certain laboratories have restricted access and entry is not allowed without authorisation from the supervisor in charge of the laboratory. All of these laboratories will have a sign on the door indicating the restriction, and the person to whom you need to contact if you require access. Your supervisor will give you guidance if in doubt.

Dissertation project laboratory work can only be carried out during normal working hours (9.00am 5.00pm) Monday to Friday. In exceptional circumstances, if an experiment requires you work outside these hours, this can be arranged providing that you are closely supervised for the duration of the work.