



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

Faculty of Engineering and Information Sciences

Laboratory Safety Manual

Emergency Telephone Numbers

UOW Security	4221 4900 (ext 4900)
Emergency Services – Police, Fire Brigade, Ambulance	(0) 000
Wollongong Hospital	(0) 4222 5000

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1 Introduction

The purpose of this information is to provide practical safety guidance for all who may be required to visit, work or learn in any laboratory that is under the control of The Faculty of Engineering and Information Sciences.

Laboratories contain many potential safety hazards such as operating machinery and chemicals to name a few. Using effective risk management activities we can ensure people are able to work in a safe environment and control and minimise hazards to prevent injuries.

1.1 MESSAGE FROM EXECUTIVE DEAN

The Faculty of Engineering and Information Sciences (EIS) recognises safety in the workplace is vital for everyone and so is committed to providing a safe and healthy workplace for its staff, students and visitors. This manual provides you with an overview of safety and how the University and EIS manage risk and safety across a range of hazards.

The Faculty has grown enormously over the last few years with each new laboratory tending to require its own unique manual so we previously had over ten different safety manuals leading to a degree of confusion, much re-inventing of the wheel and considerable technical and administrative effort to keep them all up-to-date. However, now we have this single landmark document which brings together into one place all the information needed for every laboratory. This will greatly streamline our safety approaches, making them clear and consistent, and making our operations even safer.

2 Key Contacts

EIS Central	4221 3491
EIS Senior Technical Officer WHS	4221 4724
UOW Security	
Emergency	4221 4900
General Enquiries	4221 4555
Wollongong Hospital: Emergency	4222 5000
Wollongong Police Station	4226 7899
IOH Wollongong	4229 6111
UOW WHS Unit	4221 3931

3 Responsibilities

To ensure a safe workplace, including laboratories, there are defined responsibilities to ensure people are aware of what to do and what is expected of them. These responsibilities are shared by all staff in the workplace. Further information on responsibilities can be found in the [Roles and Responsibilities Guideline](#).

3.1 EXECUTIVE DEAN

- ⇒ Ensure activities of the Faculty/Division comply with work health & safety legislation and UOW WHS management system, including implementation and monitoring to ensure legal compliance.
- ⇒ Ensure WHS consultation arrangements are implemented.
- ⇒ Allocate appropriate resources to fulfil WHS requirements.
- ⇒ Monitor WHS performance of faculty/division and direct reports including internal WHS verification reports and performance indicators.

3.2 HEAD OF SCHOOL

- ⇒ Ensure activities of the school/research centre/unit comply with workplace health & safety legislation and UOW WHS management system.
- ⇒ Implement WHS risk management activities e.g. inspections, report of incidents and any local specific measures required to eliminate or reduce risk in their area that are identified, documented and implemented.
- ⇒ Provide safe equipment and processes for staff, students and others.
- ⇒ Provide staff and students with the necessary instruction, information, induction, training and supervision to enable work to be carried out safely.
- ⇒ Implement corrective actions as a result of hazard/incident reports or incident investigations.
- ⇒ Monitor the WHS performance of unit and direct reports via internal WHS verification audits and performance indicators.
- ⇒ Local workplace health and safety procedures are developed, documented.

3.3 SUPERVISORS AND SUBJECT COORDINATORS OF HONOURS AND POSTGRADUATE STUDENTS

- ⇒ Ensure that work areas and equipment under their control is safe and without risk to health and safety.
- ⇒ Implement WHS risk management activities e.g. risk assessments, hazards inspections.
- ⇒ Ensure all hazards and incidents are identified, assessed, controlled and reported via the SafetyNet reporting process.
- ⇒ Provide appropriate instruction, information, training and supervision to staff, students and others to enable work to be carried out safely.

3.4 ALL STAFF, STUDENTS AND VISITORS (INCLUDING HONORARY AND VISITING FELLOWS)

- ⇒ Take reasonable care for their own health and safety.
- ⇒ Take reasonable care for the health and safety of others including the implementation of risk control measures within their control to prevent injuries or illnesses.
- ⇒ Comply with any reasonable instruction by the University.
- ⇒ Cooperate with any reasonable policies and procedures of the University including reporting of hazards or incidents using the online SafetyNet reporting process.

4 Emergency Management

4.1 EMERGENCY PROCEDURES

Emergency contact information can be found in the front of this manual. In the event of an emergency it is important to contact UOW Security by phone or using the SafeZone App.

The [UOW Emergency Procedures Guide](#) contains information on dealing with various types of emergencies that may occur.

4.2 SECURITY / SAFEZONE

SafeZone is a free location-based app for smart mobile devices making it easier to contact UOW Security if help is needed whilst on campus.

Learn more about using the [SafeZone](#) app.

4.3 EMERGENCY TELEPHONES

Security Telephones, coloured blue are easy to identify and are found in strategic locations external to buildings. Security telephones are provided to enable people to call for assistance from Security, emergency services, or to arrange safe transport through the local taxi company or seek motor vehicle break down service through the NRMA. Telephones have blue lights fitted to assist locating at night.

4.4 FIRST AID

4.4.1 First Aid Kits

First aid kits are available in work area, including laboratories and workshops, and maintained by the Appointed First Aid Officer and by the University. If you use items from the first aid kit, you must notify the Appointed First Aid Officer.

4.4.2 Appointed First Aid Officers

Appointed First Aid Officers are available for each building and can be found in the [Appointed First Aid Officers Contact list](#) or on signage located near the first aid kit.

Further information regarding [First Aid](#) can be found on the UOW WHS webpage.

4.5 IN CASE OF FIRE

Standard Fire Orders and Emergency Evacuation information is displayed throughout buildings. Know what to do in the event of a fire by checking your local plans in your building.

In case of fire or fire alarm activation in your building you should:

- ⇒ RESCUE - Rescue any people in immediate danger (only if it safe to do so).
- ⇒ ALARM - Raise the alarm, contact Security and Fire Brigade
- ⇒ CONTAIN - If practicable, close all doors and windows to contain the fire (only if it safe to do so).

- ⇒ EXTINGUISH - Try to extinguish the fire using appropriate firefighting equipment only if you are trained and it is safe to do so.
- ⇒ Follow the direction of your Building Wardens or UOW Security.
- ⇒ Proceed to the evacuation area designated for the building.
- ⇒ Wait for further directions from a Building Warden, UOW Security or Emergency Services.

4.5.1 University Building Wardens

University Building Wardens play an essential role within the University's emergency plan, specifically in relation to our initial response to emergencies, and emergency evacuation of potentially large numbers of people.

If you are asked to leave the building, by the Building Wardens or any other member of staff, you must do so immediately. Assembly points for laboratories/offices are shown on the emergency evacuation signs which are located in building common areas.

Building wardens are available for each building and can be found in the [Building Warden Contact list](#).

4.5.2 Assembly Areas

Each building has a nominated assembly area in the event of an emergency. A list can be found on the [Assembly Areas](#) webpage.

4.6 HAZARD AND INCIDENTS

Hazards, incidents, injuries, dangerous occurrences which occur or have the potential to occur are to be reported to your supervisor as soon as possible. A record of the event must be entered into the University SafetyNet hazard and incident reporting system.



You must report hazards, incidents and near miss in [SafetyNet](#).

Further information can be found on the [Hazard and Incident Reporting](#) webpage.

4.7 SHARPS AND NEEDLE STICK INJURIES

Sharps are commonly used during research, undergraduate teaching, in clinical practice or applying first aid. 'Sharp' encompasses syringes, needles, scalpels, razor blades, broken glass and any other sharp implement with the potential to cause a penetrating injury if not handled in a safe manner.

Sharps can potentially be contaminated with many different types of micro-organisms and whilst the risk from blood borne viruses such as Human immunodeficiency viruses (HIV), and Hepatitis B and C is generally well known, there are many other micro-organisms that are found in contaminants such as blood, faeces, sewerage, human or animal secretions. Therefore all sharps, unless their origin is known, should be treated as contaminated.

Further information can be found in the [UOW Working with Sharps Guidelines](#).

4.8 SPILL MANAGEMENT

If you intend working with a hazardous chemical then you must ensure that you have a spill kit and appropriate personal protective equipment available. If necessary perform your work in an appropriate fume cupboard. Chemical spills must be cleaned up immediately.

Inform your supervisor or technical staff if the spilled material is of a hazardous nature, which can be ascertained from the appropriate Safety Data Sheet available from ChemAlert. Specific information on spills clean-up methods should be obtained from the Safety Data Sheet.

Prior to commencing the clean-up ensure you are wearing the appropriate personal protective equipment. It should be noted that even small spills of volatile materials in a confined space could generate significant concentrations of fumes and respiratory protection may be needed.

Further information can be found in the [Chemical Spill Management Guidelines](#).

4.9 BUILDING MAINTENANCE

The Facilities Management Division is responsible for the University's built environment. The Division has particular responsibility for Building Construction, Security and Parking, Maintenance and Landscaping, Cleaning and Logistical Assistance, Property and Administration, Space management and provision of furniture.

To report maintenance issues notify your supervisor and contact the appropriate Facilities Management unit for your campus.

Wollongong Campus Office Hours: FMD Service Centre on 4221 3217 or email: fm-service-centre@uow.edu.au.

Innovation Campus Office Hours: Resolve FM on 1300 705 254 or email: hub@resolvefm.com.au

After hours maintenance emergencies, contact Security on 02 4221 4555.

Further information can be found on the [Facilities Management Division](#) and [Emergency Procedures](#) webpage.

5 Risk Management

5.1 WORKPLACE HEALTH AND SAFETY CONSULTATION

Safe@Work Committees (SWC) are our local consultation mechanism to discuss health and safety issues and seek appropriate resolution. The EIS SWC is made up of [representatives](#) from the Faculty and Schools to facilitate consultation for each group. The EIS SWC is also represented at the UOW WHS Central Committee.

Further information can be found on the [WHS Consultation](#) and [EIS Workplace Health & Safety](#) webpage

5.2 HAZARD IDENTIFICATION

Workplace safety inspections are performed to identify hazards in the work area.

These workplace safety inspections are undertaken at least twice yearly of all Faculty laboratories. Normally a self-inspection involves an experienced person from the area or the School representative on the Faculty SWC and the supervisor of the area. WHS inspections use a checklist to help identify hazards.

Once hazards are identified solutions are to be put in place and actions are to be recorded in SafetyNet.

Further information can be found on the [Workplace Safety Inspection Guidelines](#).

5.3 RISK ASSESSMENTS

Risk assessment is the overall process of identifying, assessing and controlling risk. The risk assessment process is contained, and is to be completed within, as far as practicable, the UOW SafetyNet system using the Hazard and Incident Report Online Form or the Risk Assessment Online Form.

Risk assessments MUST be completed before any experiments or projects are undertaken. No laboratory work will be permitted without a completed risk assessment. Risk assessments should be completed on [SafetyNet](#).

Chemical risk analysis may also be necessary. This can be determined from the relevant Safety Data Sheet. If the material is classified as high risk, a Hazardous Chemicals risk assessment will be required to be undertaken.



[Risk assessments](#) must be completed for experiments or projects.

Further information can be found on the [Risk Management](#) webpage.

5.4 FIELDWORK

Fieldwork involves performing research, teaching or instruction, outdoors at a location off campus. Students and staff must be accompanied by their supervisor, another staff member or appropriate adult.

Prior to undertaking fieldwork, a fieldwork risk assessment must be developed and approved in [SafetyNet](#) identifying possible hazards and appropriate risk management strategies to be employed.

Students must ensure that a University employee knows when and where they are undertaking fieldwork and what time they are expected back. They must have some means of communication.

Fieldwork must be with two or more people. Fieldwork requires permission from your supervisor.



The [Fieldwork Participant Acknowledgment](#) form is to be completed prior to fieldwork.

Further information can be found on the [Fieldwork](#) webpage.

6 Security Management

6.1 PERSONAL SAFETY

Consider your personal safety when working at the university. Information can be found on the [Personal Safety](#) webpage.

6.2 LABORATORY OPERATING HOURS

Laboratory operating hours are nominally weekdays from 8:00am to 5:00pm, but may vary dependent upon local area requirements.

All persons requiring access to laboratories are required to undergo an induction in order to become familiar with hazards, risks and safety equipment.

6.3 AFTER HOURS WORK

Anyone requiring access outside of normal operating hours is required to apply for afterhours access by completing the appropriate section on the [Laboratory Access – Application](#) form.

Staff and students **MUST** complete work by 10.00pm.

No maintenance/modification of any equipment should take place after-hours.

When afterhours category 2 or 3 work is being performed it is recommended that at least two people are within close proximity.

For safety reasons afterhours work requires:

1. Signed Authority

It is a general rule that undergraduate students do not have afterhours access.

Undergraduate students requiring afterhours access for a specific time or a specific purpose must apply using the Laboratory Access – Application form. The Laboratory Access – Application form must be authorised by the appropriate personnel dependent upon task to be performed and a copy of the [WHS Induction Acknowledgement](#) form must be attached.

Staff and postgraduate students must also have an approved Laboratory Access – Application form authorised by appropriate personnel dependent upon task to be performed. University ID cards must be carried when working after hours.

2. Rules of access

- ⇒ Ensure that the doors to buildings are securely closed and locked after entering and leaving the building or laboratory.
- ⇒ Ensure that doors to internal areas are secured on leaving
- ⇒ Ensure that you are familiar with safety rules and emergency contact numbers
- ⇒ Report to University Security any breaches of security or suspicious behaviour
- ⇒ You will not lend keys, access cards or security codes to another person
- ⇒ You must not provide access to buildings to unauthorised persons

3. Operation of Equipment

No medium to high risk equipment may be operated unless:

- ⇒ Two persons are present
- ⇒ The operator has received training in its use
- ⇒ You have permission to use the equipment

It is the supervisor's responsibility to ensure their student has been trained in the use of any equipment.

4. Accompanying Persons

All accompanying persons must be over 18 years of age and be briefed by the staff member to ensure they are familiar with emergency procedures and contact numbers.

Any breach of the conditions will result in afterhours access being immediately cancelled.



The [Laboratory Access – Application](#) form **MUST** be completed prior to working outside core hours.

6.4 WORKING ALONE

A risk management approach is used to determine whether working alone is an acceptable risk to the University. Categories have been set which determine those activities which can be done while working alone as in the table below.

Category	Cat 1	Cat 2	Cat 3
Risk	Low	Medium	High
Examples	General Office Work: reading, writing, use of instrumentation which is considered to pose no risk.	Any laboratory work that does not involve toxic, radioactive, corrosive, explosive, bio-hazardous or flammable substances.	Laboratory work involving toxic, radioactive, corrosive, explosive, biohazardous or flammable substances. Operation of equipment classed as high risk.
Approved Time	Any time	8:00am–10:00pm	8:00am–5:00pm weekdays
Working Alone	 YES	 NO	 NO

Staff and students must not work alone in laboratories where chemical substances are handled or housed, where radioactive isotopes are handled, or operation of equipment e.g. rolling mills, workshop equipment.

Emergency assistance – a means of communication to gain assistance in an emergency MUST be available. The telephones in the laboratories can be used to contact the emergency services. If this is necessary, security should also be informed in order to meet the emergency vehicle at the front gate.

Further information can be found on the [Working Alone](#) webpage.

6.5 OVERNIGHT EXPERIMENTS

Experiments posing significant hazards which are to be left unattended should have safety precautions in place as follows.

All potentially hazardous reactions unattended at any time after normal working hours must be set up in fume cupboards. All hazardous experiments must carry an “[experiment in progress](#)” notice with a name, telephone number for contact in case of an emergency and hazards.

6.6 LABORATORY ACCESS

Buildings and spaces are restricted by access cards or physical keys. Access is provided only to authorised staff and/or students who have been through the induction process. In an effort to ensure access is

maintained any doors should be secured when unattended. Only approved people are provided access and entry to buildings and spaces.

Access process is fully outlined in the [Access to EIS Laboratory Procedure](#).

6.7 CONTRACTOR ACCESS

Accessing laboratories will normally require prior consultation between campus Facilities Management (FMD or Resolve FM) and the School staff member responsible for the laboratory to identify safety hazards.

UOW personnel engaging contractors are responsible for assessing the competence of contractors to meet WHS specifications and ensuring that contractors engaged by the University are aware of any WHS hazards that may exist in the area in which they are working.

Any Contractor performing work in a Lab will require induction prior to work commencing. This induction will need to ensure local area hazards and risks are identified and adequately controlled. The induction is to be completed by the UOW officer engaging the contractor.



Any Contractor performing work in a Lab will require induction prior to work commencing.

Further information can be found on the [Contractor Safety](#) webpage.

7 Safety Equipment

Ensure that all safety equipment remains accessible to laboratory/workshops occupants at all times.

7.1 SAFETY SHOWERS

Safety showers to be used in the situation of chemical contamination etc. Safety showers are in all laboratories containing fume cupboards.

7.2 EYE WASH SPRAYS

Eye wash sprays are used to flush the eyes if chemicals are splashed into them. These may either be in combination with the safety showers or standalone eyewash or drench hose. In the event of chemicals splashing in the eyes, the stream of water from the spray should be directed into the eye for a period of 15 minutes before seeking medical attention.

Further information can be found in the Emergency Eyewash Station and Safety Showers can be found in the [Emergency Eyewash Station and Safety Shower Guideline](#).

7.3 FIRE FIGHTING EQUIPMENT

This equipment is provided in all laboratories to extinguish minor fires only. If there is any risk from the fire the building should be evacuated. Before using a fire extinguisher read the instructions ensuring that it is appropriate to the type of fire.

Further information can be found using the [Fire Extinguisher Selection and Use](#) procedure.

7.4 PERSONAL PROTECTIVE EQUIPMENT

Students shall use protective clothing and equipment for the purpose provided and in the manner required by the University. Students are required to notify their supervisor of any defects or deficiencies which they become aware of.

If personal protective equipment is provided and required for the operation of the equipment, it must be used.

Documents such as Risk assessments, Safe working procedures, safe operating procedures and Safety Data Sheets provide information of what is required to be worn for the exposure to the hazards.

Further information can be found u the [Personal Protective Equipment guidelines](#).

8 Induction and Training

8.1 INDUCTION

Local area WHS inductions are available for staff, students and contractors based on WHS risk and requirements for their activities in the area. These inductions will identify local hazards, risks specific to the location and emergency information and may also include:

- ⇒ responsibilities under WHS legislation and UOW WHS Policy
- ⇒ WHS consultation arrangements
- ⇒ hazard and incident reporting
- ⇒ WHS training
- ⇒ Laboratory Management Guidelines

8.2 TRAINING

Students must ensure they have been fully instructed in, and understand the use of equipment before operating it. Students must have appropriate documentation which demonstrates they have been approved and deemed competent to use equipment.



You must be adequately and appropriately trained in the safe operation of any plant and equipment you are required to use.

Further information can be found in the [WHS Training](#) webpage, [EIS Training and Competency Assessment Procedure](#) and the [EIS WHS Competency Assessment Checklist](#).

8.3 USE OF EQUIPMENT

No equipment of any type may be operated unless the person is authorized to do so. Authorisation is obtained by participation in a process of induction, which means obtaining instruction from the appropriate technical or academic staff in its use. This also applies to the safe use of substances.

Equipment is not to be removed without authorisation from an appropriate staff member. Any equipment that has been in use should be returned (typically) at the end of each day.

Further information can be found on the [WHS Training](#) webpage.



You must be authorised to operate and use equipment.

9 Working Safely in Laboratories and Workshops

9.1 LABORATORY RULES

The University has described the basic requirements for ensuring laboratory safety. Refer to the [Laboratory Safety](#) webpage for further information.

It should be noted the [Laboratory Safety Guidelines](#) do not cover every operation which may occur in University laboratories. If you are in doubt about a procedure please consult the person responsible for the laboratory or the Head of School.

9.2 MY CONDUCT

Requirements for conduct in a lab are:

- ⇒ Always adopt an alert attitude and be conscious of potential hazards.
- ⇒ Always report hazards, faults, incidents and injuries to the appropriate person.
- ⇒ Regard all substances as hazardous unless there is definite information to the contrary.
- ⇒ Do not undertake any work unless the potential hazards of the operation are known as accurately as possible, and the appropriate safety precautions, including containment, are adopted.

9.3 BEHAVIOUR

- ⇒ Do not run in the laboratory or in corridors.
- ⇒ Apply common sense in the laboratories, avoid reckless behaviour and never indulge in practical jokes or unauthorised experiments. Indulging in 'horseplay' and practical jokes in the laboratories is strictly prohibited.
- ⇒ Care should be taken when opening and closing doors and entering or leaving the laboratory.
- ⇒ Smoking is not permitted in any University building or vehicle
- ⇒ Eating and drinking are not permitted in any laboratory.
- ⇒ Persons under the influence of, or affected by alcohol or other substances, both legal and illegal are prohibited from working in the laboratory.

9.4 HYGIENE

- ⇒ Do not handle, prepare, store or consume food or drink for personal consumption in the laboratory.
- ⇒ Do not store food or drink for personal consumption in a refrigerator, freezer or cupboard which is used to store laboratory materials.
- ⇒ Wash skin areas which come in contact with chemicals, irrespective of concentration.
- ⇒ Wash hands upon leaving the laboratory.

9.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Every person working in laboratories must ensure that they wear the appropriate footwear and clothing according to local laboratory requirements. This includes suitable non-slip, enclosed footwear at all times.

- ⇒ Always wear eye protection when in the laboratory area.
- ⇒ It is recommended that natural fibre clothing such as cotton or wool be worn in chemical



laboratories.

- ⇒ Contact lenses are not recommended in chemical laboratories.
- ⇒ When fieldwork is involved, clothing suitable to the location must be worn. Singlets, tank tops or similar clothing are not suitable.
- ⇒ Use protective clothing and devices appropriate to the type of operation being carried out.
- ⇒ Ensure that personal clothing is suitable to laboratory conditions, e.g. non-slip, closed-in footwear. Do not wear open-toed shoes in the laboratory.
- ⇒ Do not apply cosmetics or handle contact lenses in the laboratory and only wear jewellery that either cannot be caught in equipment or contaminated by infectious substances or chemicals, or is protected from these hazards.
- ⇒ Long hair is to be tied back when operating equipment e.g. drills, lathes, mills, etc.
- ⇒ Short sleeved shirts for machining and long sleeve for welding operations – no loose clothing around machines.



 Minimum PPE in lab or workshop may include: fully enclosed footwear, safety eyewear and clothing.

Further information can be found on the [Laboratory Safety](#) webpage.

9.6 HOUSEKEEPING

- ⇒ Floors are to be kept tidy and dry.
- ⇒ Benches are to be kept clean and free from chemicals and apparatus that are not being used.
- ⇒ Aisles and exits are to be kept free from obstructions.
- ⇒ Bottles and glassware are to be kept off the floor.
- ⇒ Access to all emergency equipment (fire extinguishers, first aid kit) is to be kept free from obstruction.
- ⇒ Work areas and equipment are to be thoroughly cleaned after use.
- ⇒ Practise good housekeeping, e.g. immediately cleaning up spills and disposing of wastes including packaging.
- ⇒ Keep all fire-escape routes completely clear at all times.
- ⇒ Chemicals that are being used are capped immediately (to prevent fume build up), stored appropriately and have Safety Data Sheet (SDS). New chemicals or new brands of existing chemicals (i.e. glue, degreaser etc.) must have an SDS and have that forwarded to the Senior Technical Officer (WHS) to be added to ChemAlert.

 Chemicals must be labelled and stored appropriately and have SDS in ChemAlert.

10 Hazardous Chemicals

Safety data sheets (SDS) sheets must be consulted before carrying out any laboratory work involving the use of chemicals. The SDS gives details of the characteristics of the chemicals, any hazards associated with their use, including toxicity, known carcinogenic behaviour, disposal restrictions, spillage clean-up procedures, personal protective equipment required, and any other relevant safety instructions.

Safety data sheets are available electronically on the University's chemical system [ChemAlert](#).

 You must be able access a Safety Data Sheet for the Chemical.

Further information is available in [Chemical Management](#) webpage.

10.1 LABELLING

In general, a label is required for any substance, mixture or article classified as a hazardous chemical under the WHS Regulations.

Labelling must be implemented as outlined in the [Working With Hazardous Chemicals and Dangerous Goods Guidelines](#).

10.2 HAZARDOUS WASTE

Any hazardous waste generated **MUST** be managed according to the [Hazardous Waste Disposal Guidelines](#).

10.3 DANGEROUS GOODS

These items are included in the broader classification of Dangerous Goods. Dangerous Goods are substances or articles classified by the United Nations based upon the characteristics they display. Generally speaking, this means that "chemicals and explosives" are grouped and labelled based upon the physical hazards they pose.

There are nine classes of dangerous goods:

- ⇒ Class 1 Explosives
- ⇒ Class 2 Gases (Flammable, Compressed/Non-Toxic, Poisonous)
- ⇒ Class 3 Flammable Liquids
- ⇒ Class 4 Flammable Solids
- ⇒ Class 5 Oxidisers & Organic Peroxides
- ⇒ Class 6 Toxic Substances
- ⇒ Class 7 Radioactive Substances
- ⇒ Class 8 Corrosive Substances
- ⇒ Class 9 Miscellaneous Dangerous Goods

A risk management approach is required for the storage and handling of dangerous goods as required by the [Working With Hazardous Chemicals and Dangerous Goods Guidelines](#).

10.4 CHEMICAL STORAGE

- ⇒ Never store mutually reactive substances together. The easiest way to ensure this happens is to segregate each dangerous goods class. Appropriate storage containers should be used. Chemicals in different dangerous goods class must not be stored one above the other. Be aware that there is often a primary and a secondary dangerous goods class.
- ⇒ Keep only the minimum required quantities of hazardous substances in the laboratory work area.
- ⇒ Refer to [Dangerous Goods Storage Compatibility Guide](#) for further information.

10.5 GAS STORAGE AND HANDLING

The following control measures should be used when moving cylinders:

- ⇒ The use of purpose-built trolleys or other suitable devices for gas cylinder transportation.
- ⇒ Securing the gas cylinder's valve, disconnecting and removing associated distribution equipment.
- ⇒ Shutting the cylinder's valve, disconnecting and removing associated distribution equipment.
- ⇒ A requirement that only properly trained personnel is permitted to move cylinders.
- ⇒ Laboratory procedures preventing the manual movement of larger gas cylinders.

Further information is available in the [Storage and Handling of Gas Cylinders Guidelines](#).

10.6 CRYOGENIC FLUIDS

Cryogenic fluids are defined as fluids having a boiling point below -150°C at atmospheric pressure. Cold contact burns, frost bite, suffocation, lung disorder and general body cooling can result from exposure to cryogenic fluids.

In addition, liquid oxygen and hydrogen present a fire hazard. It should also be noted that liquid nitrogen although not flammable in itself is sufficiently cold to condense oxygen out of the atmosphere which can then present a hazard.

All users of cryogenics must undergo training in their use by the academic in charge of the laboratory or his nominee as part of their laboratory induction.

Further information is available in the [Storage, Transport and Handling of Cryogenics Guidelines](#).

10.7 USE OF LIFTS TO TRANSPORT DANGEROUS GOODS

No one should ride in the lift in the presence of hazardous substances (e.g. flammable liquids, acids, explosives etc.) or gases (e.g. cylinders of compressed or liquefied gases) or cryogenics (e.g. liquid nitrogen, helium, oxygen) since these are all substances of goods which pose a danger in poorly ventilated and/or confined spaces.

This restriction is not intended to stop anyone from using the lift to transport hazardous substances or gases it just means that no one should be in the lift with these goods during that time.

When transporting gas cylinders only one cylinder should be loaded into the lift at a time. The cylinder must be properly secured on an approved, stable trolley during transport. The trolley itself must be tightly secured to the handrail with the hook and chain attached to the trolley.

A sign should also be placed on the container to inform people what the substance is and not to travel in the lift whilst the substance is being transported.

10.8 FUME CUPBOARDS

To avoid the exposure of staff and students to fumes in laboratories, fume cupboards are provided.

Further information can be found on the [Laboratory Safety](#) webpage.

10.9 GLASSWARE

- ⇒ When cleaning glassware, protective gloves should be worn; commercial cleaning agents should be used; chromic acid should only be used as a last resort
- ⇒ All broken glass should be placed in bins that are marked broken glass only; broken glass should not be placed in normal waste bins
- ⇒ Glassware that requires modification by glass blowing must be thoroughly washed prior to this operation to avoid oral poisoning or explosion that may result from heat or a source of ignition being applied to residues
- ⇒ Pipetting by mouth is not allowed; pipette pumps must be used

Further information can be found in the [Laboratory Safety](#) webpage.

10.10 REFRIGERATION

Refrigeration is commonly used in laboratories and a number of safety precautions needed to be taken including:

- ⇒ Care must be taken when using domestic refrigerators in laboratories to ensure that flammable liquids are not stored in them. Sparks from thermostats and light switches can ignite fumes leading to explosion.
- ⇒ Flammable liquids requiring refrigeration should be stored in refrigerators that are intrinsically safe. (Refrigerators that have spark proof wiring).
- ⇒ Labelled with No drink and Food to be stored in the fridge.
- ⇒ Do not store or place flammable liquids in domestic refrigerators in the laboratories.
- ⇒ Sparks from thermostats and light switches can ignite fumes, leading to explosions.
- ⇒ Flammable liquids requiring refrigeration must only be placed in refrigerators that are intrinsically safe i.e. have spark proof wiring.

10.11 SAMPLE STORAGE

Storage of chemical and radioactive isotopes samples should be minimized. Store samples according to:

- ⇒ Samples must be stored in appropriate containers to prevent spillage.
- ⇒ Samples must not be stored in volumetric glassware.
- ⇒ Do not store samples in food or drink containers.
- ⇒ Approval to store any hazardous material should be sought from the Supervisor of the relevant laboratory.
- ⇒ Samples of hazardous material should be clearly labelled and comply with the dangerous goods and hazardous substance requirements.

10.12 MANUAL HANDLING

Lifting and carrying excessive weights is hazardous and can cause injury, often not immediately present.

Further information can be found in the [Materials Handling](#) webpage.

11 Plant and Equipment

11.1 EQUIPMENT USE

- ⇒ Refrigerators, freezers, ovens and microwave ovens used in the laboratory should be labelled to prohibit their use for food or drink for personal consumption.
- ⇒ Keep only the minimum required quantities of chemicals in the laboratory work area.
- ⇒ Label all safety equipment and maintain it in good operating condition. Check and inspect safety equipment for correct operation in accordance with the manufacturer's instructions and report, in writing, any requirement for maintenance.

11.2 ELECTRICAL SAFETY

These guidelines outline the University's electrical safety program, aimed at reducing the risk of exposure to electrical hazards for staff, students, visitors and contractors. These guidelines are applicable to all areas within the University in which work, teaching or research is performed.

Further information can be found in the [Electrical Safety Guidelines](#).

In addition to requirements outlined above, any work, such as electrical experimentation, involving electricity above extra low voltage to AS/NZ3000 (25 Vrms AC or 60 Vdc) the following is required:

- ⇒ An authorised risk assessment
- ⇒ Precautions to protect other lab users from inadvertently contacting live conductors

Under no circumstances are live exposed conductors to be used without some protection for the experimenter and other lab users.

11.3 REPORTING MINOR MAINTENANCE

Minor maintenance, such as leaking taps, inoperative lights, steam leaks, faulty electrical switches, should be reported to a Supervisor or Technical staff as soon as possible. In cases where safety risk is involved (e.g. leaking gas taps) or where the Laboratory Manager is not readily available, contact FMD Service Centre on extension 3217 during office hours.

11.4 ELECTRICAL SUPPLY

FMD is responsible for all electrical infrastructure including powerpoints.

- ⇒ Double and multiple adaptors must not be used.
- ⇒ Approved powerboards used only.

11.5 DEFECTIVE EQUIPMENT

- ⇒ When in doubt consult the University electrician.
- ⇒ Ensure that all electrical cables and equipment are kept off floors where possible to facilitate cleaning and minimise damage due to flooding.

Any defect found during operation of equipment must be reported to your supervisor or Technical Officer. Equipment must not be used for purposes other than that for which it was designed.

When working with electrical equipment treat all electrical supplies as hazardous. Even a few volts may cause serious shock. Switch off electrical equipment before adjusting circuits or making external connections to meter etc. Before switching off electrical equipment, ensure all controls are set to zero. Before using electrical equipment check that the mains cable has not been abraded or has cracked / cut insulation. Check that the e-tag is current.

Refer to the [Managing the Risk of Plant Guidelines](#).

11.6 HIGH TEMPERATURE EQUIPMENT

- ⇒ Care must be taken to avoid burns, eye and skin damage and fire.
- ⇒ Wear thermal gloves, glasses, lab coat and covered shoes.
- ⇒ Ensure you are aware of the closest firefighting equipment and familiar with firefighting procedures

11.7 DESIGN OF TEACHING/RESEARCH EQUIPMENT

Staff or students responsible for designing equipment or processes for teaching or research purposes must complete a risk assessment prior to development. The risk assessment must be approved to ensure that all risks from identified hazards are controlled to prevent injury or illness prior to development.

Design considerations to be addressed in the risk assessment include:

- ⇒ Construction methods – including processes and materials;
- ⇒ Use and maintenance – especially risk arising out of the nature of the design itself;
- ⇒ Removal, demolition or decommissioning activities.

The risk assessment is to be conducted in accordance with the [WHS Design and Modification Guidelines](#).

11.8 ROBOTICS

Robotics can range from small units of limited power to large, very powerful and very fast units that can have many hazards and risks associated with their design and use.

Robotics should be safeguarded by one or a combination of the following:

- ⇒ guarding, to prevent access by personnel to restricted space;
- ⇒ presence-sensing devices;
- ⇒ other safe-guarding equipment that complies with relevant regulations.

Guarding should be incorporated into the design and construction of the robot. The guards should be fixed with no moving parts associated with, or dependent on, the mechanism of the robot.

Robots must also be fitted with an Emergency Stop button and be constructed or mounted to prevent unintentional operation.

11.9 LIFTING EQUIPMENT

Working with and around jib and overhead cranes require specific controls. Anyone working with this equipment must be an approved staff member and follow the requirements outlined in the Safe Work Procedure.

Do not walk under suspended loads, or place any part of your body (hands/feet) under a load during lifting. Follow SWP if working with a crane.

11.10 FORKLIFTS

Forklifts are to be operated by an approved staff member holding a high risk licence. When forklift is in operation avoid area if possible, approach only if necessary and always ensure driver can see you when approaching a forklift. Follow SWP.

12 Radiation

12.1 GENERAL

Any radiation or apparatus sources used must be below the activities requiring a license and below the levels requiring a licensed radiation laboratory. However, the aggregate activity of all the sealed sources of each isotope may require a license.

A strict 'no working alone' policy operates in all radiation laboratories.

If you are required to work with radioactive substances or the irradiating apparatus is it important that you read the [Radiation Safety Guidelines](#).



Any proposed work involving radiation requires completion of the [Radiation Project Approval Form](#).

12.2 LASER SAFETY

Lasers are capable of producing intense, collimated beams of light at specific wavelengths (visible, ultra violet and infrared). While lasers vary greatly in power output, wavelength and purpose, the hazard potential for eyes and skin can be significant due to the concentrated energy density.

Lasers must be used in accordance with [Laser Safety Guidelines](#).

12.3 RADIOISOTOPES

Personnel working with radioisotopes will wear a full-length button-up laboratory coat and covered shoes. These articles will not leave the radiation laboratory to minimise possible contamination. Any volatile substances must only be used in the fume cupboard.

Radioisotopes should be appropriately stored after use in a spillage tray lined with absorbent paper. Wipe tests of the area used should also be performed and counted in a scintillation counter. Contamination tests should also be performed on soles of shoes and the floor.

Always wash hands thoroughly after using radioisotopes.

13 Biological

13.1 BIOHAZARD ASPECTS

Certain laboratories frequently involve working with materials that are biologically contaminated. Before any work involving these materials is started, students must be fully vaccinated for both Hepatitis A and Hepatitis B. In some cases a tetanus booster is required. The academic supervisor will require proof of this before any work commences.

These materials must be handled carefully to avoid health problems. Appropriate gloves are available for use in the laboratories and should be worn at all times. Laboratory coats and eye protection must also be worn. For materials that may generate aerosols, respiratory protection should also be worn.

All containers, implements and apparatus that have been contaminated with biologically active materials must be disinfected after use. Benches and workspaces must be disinfected.

Clothes, boots etc. should be washed carefully after each exposure to contaminated material. It is advised that contaminated clothing be washed separately from other clothes and a bacteriological agent.

Additional information can be found on the [Biosafety and Sharps](#) webpage.

14 Working Safely

14.1 WORKING AT HEIGHTS

Access to roof areas are for approved staff only and require working at heights procedures to be followed.

Additional information can be found on the [Fall Prevention](#) webpage.

15 Waste

Generation of waste that is unsafe to dispose of with general waste must be disposed of as hazardous waste in accordance with UOW and legislative requirements.

- ⇒ Dispose of specialized wastes (e.g. broken glassware, syringe needles, biological and radioactive substances) in containers designated for the particular type of waste.

Need assistance with the disposal of hazardous waste in your area - refer to the [Hazardous Waste Management Contact List](#).

Additional information can be found in the [Waste management](#) webpage.

15.1 LIQUID WASTE

- ⇒ Always ask staff about the correct method of waste disposal.
- ⇒ Aqueous acidic and alkali wastes can be disposed of down the sink with adequate dilution. If possible neutralisation of one with the other is recommended.
- ⇒ Metallic wastes may have to be collected depending on the nature and concentration of the metal. Metal waste can be disposed of into appropriately labelled 5 litre plastic containers available from staff. These containers will be periodically collected and delivered to the University's waste store.
- ⇒ No organic waste should ever be disposed of in the sink. Organic wastes should be divided into halogenic and non-halogenic wastes and disposed of in appropriately labelled 5 litre plastic containers available from staff. These containers will be periodically collected and delivered to the University's waste store.

15.2 SOLID WASTE

- ⇒ Solid waste such as soils can be disposed of in the laboratory garbage bins. Common sense should be used to judge when a bin is too heavy. Remember, the cleaners have to empty these bins and heavy bins can cause injury. Large quantities should be disposed of in the skip bin. These instructions apply to clean waste only – no hazardous, infectious, radioactive or bio-hazardous material may be disposed of in this way.
- ⇒ Radioactive solid waste should be collected in the appropriate radioactive bin. This should then be double-bagged and appropriately labelled. This will then be taken to the University's radioactive waste store and disposed of.
- ⇒ Disposal of used media from microbiological experiments is into the bin. This material is autoclaved to render it sterile and then removed in the normal solid waste collection.

15.3 SHARPS/BROKEN GLASS DISPOSAL

- ⇒ It is particularly important that broken glassware is disposed of in the green glass bin. This material must not be disposed of in garbage bins or wastepaper baskets due to the hazard posed to cleaning staff.
- ⇒ Glassware and sharps require different containers. Sharps must be disposed of in approved sharps containers.
- ⇒ Dispose of specialized wastes (e.g. broken glassware, biological and radioactive substances) in containers reserved for the particular type of waste.

16 Purchasing

To ensure that the university is not 'buying in' new hazards which may pose risk to staff, students and visitors, there may be special WHS considerations to take into account when buying new equipment or substances.

In essence, there are three questions which need to be asked during the procurement process to ensure potential risk of goods and services are identified and controlled before being introduced into the workplace:

- ⇒ What WHS risks does the proposed purchase pose for health & safety?
- ⇒ How does the proposed item for purchase deal with those risks?
- ⇒ What is the supplier or University required putting into place to eliminate or where not possible, minimise the risks associated with the proposed purchase?

Purchasing of items with WHS considerations should proceed through the University's eProcurement process rather than credit card or petty cash transactions to ensure all WHS considerations and specifications are adhered to.

When purchasing hazardous chemical and dangerous goods it is important to minimise and prevent duplicate purchases, stock holdings in [ChemAlert](#) should be checked prior to purchasing to see if the product is already available in the work area.

Purchasing hazardous chemicals needs to be in accordance with the [WHS Purchasing Guidelines](#).

Refer to the [Purchasing Materials](#) webpage for further information.

16.1 RISK ASSESSMENT

Where the item being purchased requires a detailed risk assessment to be undertaken, the risk assessment MUST be developed and approved in [SafetyNet](#).

Examples of when the formal risk assessment is to be used for items which have a risk to health and safety include, but is not limited to:

- Lasers;
- Radiation apparatus;
- Radiation isotopes;
- Hazardous chemicals;
- Mobile vehicles, i.e. cars, forklifts, carts;
- Machinery and plant, i.e. lathes,
- Construction plant and equipment;
- Custom built equipment;

- Items which are identified hazardous after consultation with users.

The risk assessment should aim to identify any hazards posed by the item. Once the hazards have been identified, attempts to eliminate these from being introduced into the workplace should occur prior to use. Where this is not possible, control measures shall be determined to minimize the risk of injury.

17 Related Documents

- ⇒ [UOW Roles and Responsibilities Guideline](#)
- ⇒ [UOW Emergency Procedures Guide](#)
- ⇒ [UOW Working with Sharps Guidelines](#)
- ⇒ [UOW Chemical Spill Management Guidelines](#)
- ⇒ [UOW Workplace Safety Inspection Guidelines](#)
- ⇒ [UOW Emergency Eyewash Station and Safety Shower Guideline](#)
- ⇒ [UOW Personal Protective Equipment Guidelines](#)
- ⇒ [UOW Laboratory Safety Guidelines](#)
- ⇒ [UOW Working With Hazardous Chemicals and Dangerous Goods Guidelines](#)
- ⇒ [UOW Hazardous Waste Disposal Guidelines](#)
- ⇒ [UOW Storage and Handling of Gas Cylinders Guidelines](#)
- ⇒ [UOW Storage, Transport and Handling of Cryogenes Guidelines](#)
- ⇒ [UOW Electrical Safety Guidelines](#)
- ⇒ [UOW Managing the Risk of Plant Guidelines](#)
- ⇒ [UOW WHS Design and Modification Guidelines](#)
- ⇒ [UOW Radiation Safety Guidelines](#)
- ⇒ [UOW Laser Safety Guidelines](#)
- ⇒ [UOW WHS Purchasing Guidelines](#)

18 Version Control Table

Version	Release Date	Author/Reviewer	Approved By	Amendment
1	22-3-2016	Wayne Ireland – Senior Technical Officer WH&S	Ron Marshall – Operations Manager	Document created 22-3-2016
2	23-11-2016	Wayne Ireland – Senior Technical Officer WH&S	Ron Marshall – Operations Manager	Additional requirements on electrical safety, access control, use of equipment, forklifts, lifting equipment and working at heights. Reference made to Facilities Management for campuses.
3	27-02-2017	Wayne Ireland – Senior Technical Officer WH&S	Ron Marshall – Operations Manager	Addition to 8.1 Induction, of Laboratory Management Plan and document rebranding.
4	09-01-2020	Wayne Ireland – Senior Technical Officer WH&S	Ron Marshall – Operations Manager	Rewording of 6.2 Laboratory Operating hours, non-operational link corrections.
5	21/08/2020	Wayne Ireland – Senior Technical Officer WH&S	Ron Marshall – Operations Manager	Change to ChemAlert link in section 10 Hazardous Chemicals