



UQ Laboratory Safety Training Module



UQ Laboratory Safety Training

Course Overview:

- This training module has been developed for workers at UQ.
- **Workers refers to all staff, students, volunteers and contractors.**
- The aim is to ensure you are provided with a general understanding of many of the OHS hazards and safety controls in a UQ laboratory.

Topics include:

- Chemical Safety;
- Reproductive Hazards;
- Biological & Quarantine Materials;
- Radioactive Materials & Cryogenic Materials;
- Environmental considerations and Laboratory Waste;
- Emergency Procedures, Spill Kits, First Aid, Safety Showers & Eye-Wash Stations;
- Unattended Experiments;
- Common Laboratory Equipment;
- Risk Management, Specialist Services & Advice



UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

OHS Responsibilities → *your duty as a worker*

[Work Health and Safety Act 2011 \(Qld\)](#)

All persons at UQ have responsibilities for ensuring Occupational Health and Safety by:

- Complying with safe working procedures and laboratory practices
- Following the OHS directions given by a supervisor
- Using appropriate personal protective equipment
- Assisting with the preparation of risk assessments
- Reporting workplace OHS incidents and hazards



The specific OHS responsibilities of staff are dependent on their role.

- Refer to Policy 2.10.04 “[Staff Responsibilities for Occupational Health and Safety](#)” to review your specific OHS responsibilities.



Laboratory Supervisors/Managers & Floor Managers Responsibilities

- Provide information, training and supervision to workers relevant to laboratory tasks/activities and chemical usage.
- Ensure all laboratory workers understand how to work with chemicals and equipment safely.
- Ensure risk assessments are completed and appropriate safety controls are in place.
- Ensure all workers have and wear the appropriate personal protective equipment.
- Report OHS issues to the local Work Health and Safety Coordinator (WHSC) and/or the OHS Division.



All Supervisors and Managers must attend the UQ Staff Development Program
“OHS for Supervisors and Managers”

[Click here](#) for the next available training session.



Laboratory Work at UQ

UQ Laboratories are used for a range of activities, including:

- scientific or technical work,
- research projects,
- quality control,
- teaching,
- sample analysis.



Activities may involve a range of substances and materials, including:

- Chemicals and biologicals,
- pathogens,
- radiation,
- extreme temperatures,
- strong magnetic fields,
- processes involving electrical or mechanical work,
- equipment under pressure.



Laboratory Work at UQ

Laboratory activities and equipment will vary depending on the field of research or activities being conducted.

For example:

- A physics lab might contain a particle accelerator or vacuum chamber.
- A metallurgy lab could have apparatus for casting or refining metals or for testing their strength.
- A chemist or biologist might use a wet laboratory with a range of hazardous substances and chemicals.
- A psychologist's lab might be a room with one-way mirrors and hidden cameras in which to observe behaviour.





UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

Additional Training

Online Laboratory Safety Training is only the **first step** in your OHS training for laboratory workers at UQ.

You will also be required to:

- Attend a local Laboratory Induction with your Lab Manager
- Participate in task specific training with your Supervisor



You may also be required to complete other OHS training modules available via [Learn.UQ](#)



Biosafety



Chemical Safety



Compressed Gases Safety



Working with Quarantine Materials



X-Ray Safety Training



Chemical Safety

Knowing how to work safely with hazardous chemicals is essential to avoid injury or illness to yourself or others.

If you will be working with hazardous chemicals, you must:

- Complete the UQ online [OHS-Chemical Safety](#) training module.
- Be trained in specific safe work practices associated with the hazardous chemical.
- Be directly supervised until competent to work independently by your Supervisor.



Chemical Safety → *basics*

When using hazardous chemicals at UQ, you must:



Obtain a Safety Data Sheet (SDS) for the chemicals being used and stored via the [Chemwatch Database](#)

- Prior to use - conduct a [risk assessment](#) for safe use and storage of the chemicals.
- Ensure decanted containers are adequately labelled.
- Dispose of chemical waste in accordance with the [Waste Management Program](#).
- Ensure appropriate emergency response protocols and spill management resources.





Hazards to Pregnancy & the Reproductive System

Reproductive Hazards in the laboratory may include:

- chemicals and drugs
- microbial
- animal handling
- ionizing radiation
- manual handling



Exposure to teratogens in the first trimester can lead to structural abnormalities or miscarriage. It is highly recommended that you seek advice from the OHS Division and/or your Supervisor as soon as you are aware that you are pregnant to ensure your laboratory activities do not affect your unborn baby.

More information can also be found by referring to the UQ Guideline:

[Reproductive Hazards and Work](#)



UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

Working with Biological & Genetically Modified Materials



UQ uses many biological materials that may be potentially hazardous

- genetically modified material
 - biosecurity material (quarantine material)
 - risk group 2 or 3 biological material.
- OHS Risk Assessments must be completed prior to working with potentially hazardous biological material.
 - For emergencies involving biological hazards, contact UQ Security on [336-53333](tel:336-53333).



All persons working with potentially hazardous biological material **must** complete Biosafety training. Click here: [Learn.UQ](#)



Working with Biosecurity Goods

If you are working with Biosecurity Goods you must:

- Complete the [Approved Arrangement Accreditation](#) for AA Accredited persons (Classes 1-8) training

Attend the Working with Biosecurity Goods training course via [Learn.UQ](#)

If you are working in a Approved Arrangement but you are not an Accredited person, then you must not handle any material labelled as Biosecurity.



If in doubt



Ask your Lab Manager or WHSC



Working with Radioactive Materials

If you are working in a laboratory using radioactive materials, you must:

- Recognise the **warning or caution signs** indicating the presence of radioactive materials
- Be **trained** in specific safe work practices for your laboratory

If you are working with radioactive materials, you must:

- **Hold a licence** to work with the specific radioactive isotope
- Ensure the **facility is certified**
- All persons who work with radioactive material must **receive training** from their local [Radiation Safety Officer \(RSO\)](#) and/or the University Radiation Safety Adviser.
- To register for **Radiation Safety training**, visit the [UQ Staff Development website](#)
- Contact the OHS Division for assistance if you do not know your RSO

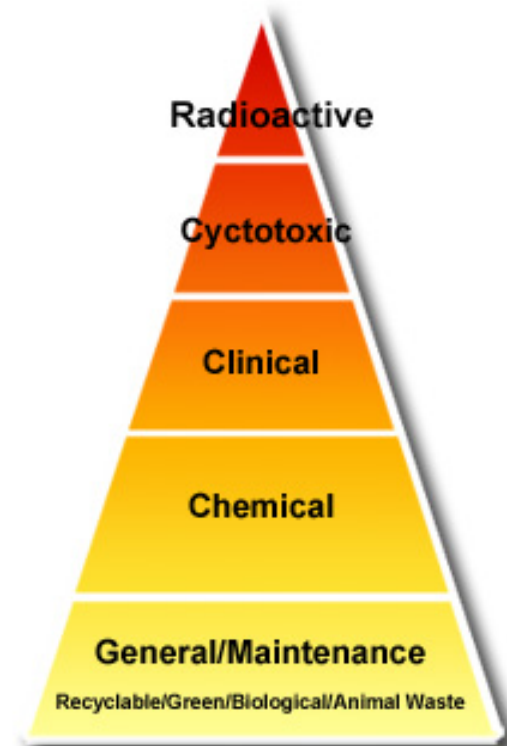




Laboratories and Minimising Environmental Impact

- Laboratories at UQ generate a range of wastes including animal waste, chemicals, clinical and related waste, cytotoxic drugs and related waste, radioactive materials, as well as recyclables and general waste.
- The procedures to dispose of these wastes can be viewed on the UQ Sustainability website, <http://www.uq.edu.au/sustainability/>
- Hazardous waste disposal must follow the Hazardous Waste Hierarchy. That is, the most hazardous waste component should be treated first as set out in the hierarchy on the right.

Hazardous Waste Hierarchy





Laboratory Waste Procedures

Chemical Waste

- Chemicals discharged to sewer must meet the Brisbane City Council Trade Waste Policy guidelines, which can be downloaded from the UQ OHS [Chemical Waste Disposal](#) webpage
- Although many laboratory chemicals can be sewerred with adequate dilution, **you must not dispose of any chemicals via the laboratory sink** unless you have verified that it is safe to do so!
- Waste chemicals that cannot be disposed of via the sewer **must be collected and disposed** of via the [University Chemical Store](#).





Chemical Waste Disposal System

- The UQ Chemical Store must be contacted to assist with disposal of your non-sewerable chemical waste
- Do not store waste chemicals in empty winchesters
- Do not stockpile chemical waste
- To obtain waste containers and arrange pick-up and disposal of your waste chemicals, contact the University Chemical Store.
- Contact details:
<http://www.uq.edu.au/ohs/chemical-waste-disposal>
- For additional information, refer to the UQ Guideline, [Chemical Waste Operating Procedure](#)





Animal Waste Procedures

- Animal waste that is **non-infectious/uncontaminated** can be disposed of via the **blue** 240 litre wheelie bins marked as '**Animal Waste for Incineration**'.
- **Infectious or contaminated** animal waste must be disposed of via the **yellow** clinical and related waste stream.
- For additional information, refer to the UQ Guideline, [Animal Waste Operating Procedure](#)





Clinical Waste Procedures

Clinical waste refers to any samples or materials that have been in contact with a pathological substance including:

- Tissue
- Blood
- Containers
- Gloves
- Agar plates
- Clinically contaminated waste
- Sharps
- Pharmaceuticals
- Infectious/contaminated animal carcasses and cage linings
- Faeces samples for diagnostic testing
- Infectious/contaminated or genetically modified soil
- Perceived clinical waste





Clinical Waste Procedures

Clinical waste (and perceived clinical waste) must be placed in the specially designated yellow bins with yellow liners that are marked with the clinical waste symbol.

For additional information, refer to the UQ Guideline:

[Clinical and Related Waste Operating Procedure](#)





Cytotoxic Drugs and Related Waste Procedures

Cytotoxic waste is material that is, or may be, contaminated with a cytotoxic drug during the preparation, transport or administration of chemotherapy.

- Cytotoxic drugs are toxic compounds known to have carcinogenic, mutagenic and/or teratogenic potential.
- All Cytotoxic Drugs and Related wastes must be placed in purple sharps containers and/or purple liners and waste bins with the white telophase cytotoxic symbol.



For additional information, refer to the UQ Guideline:
[Cytotoxic Drugs and Related Waste Operating Procedure](#)



Radioactive Waste Procedures

Radioactive wastes must be managed in ways that protect the quality of the environment, and the safety of staff, students and the wider community.

- Disposal applies to materials that are below the level of legal prescription as radioactive substances.
- The Radioactive Waste procedure lists the process for the disposal of common types of radioactive wastes.
- All other materials must be held by the school or centre of generation until the radioactive content has decayed to the prescribed levels.
- Isotopes with long half-lives may require specific disposal arrangements. The University Radiation Protection Adviser should be contacted for advice in this regard.

For additional information, refer to the UQ PPL:
[2.80.05 Management of Unsealed Radioactive Waste](#)





UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

Laboratory Emergency Procedures

Always call UQ Security in the event of any emergency:

24 hours - 7 days

(located at St Lucia and Gatton)

NOTE: Some off-campus locations may have additional local procedures. If you are working at an off-campus location, please contact your local Work Health & Safety Coordinator (WHSC) for advice.





First Aid & Medical Emergencies

- Each workplace has a First Aid Officer.
- To find your local First Aid Officer check the [Emergency Procedures Cards](#) located in your area.



THE UNIVERSITY OF QUEENSLAND AUSTRALIA

Emergency Procedures

Click here to choose site:

In case of emergency

- FIRE
- MEDICAL
- ENVIRONMENTAL
- BOMB THREATS
- ANY CRITICAL INCIDENT

**Phone UQ Security
336 53333**

FOR CONFIRMED FIRES PHONE 000

Security will contact Emergency Services

List your departmental information here:

Chief Warden	Ph
Floor Warden	Ph
First Aid Officer	Ph
Safety Coordinator	Ph

FIRE:

- Follow instructions of warden
- If warden not present, warn personnel and evacuate as necessary
- Confine fire if possible (close doors and windows)
- Do not use lift
- Go to nearest emergency assembly point

MEDICAL EMERGENCY:

- Phone Security on 336 53333
- Arrange nearby located point to meet emergency team
- Emergency procedure to
 - stay by the phone
 - meet emergency team
- Confirm site and meeting place with Security
- Note: Security will call Ambulance if required

ENVIRONMENTAL INCIDENT (e.g. spill, explosions)

- Phone Security on 336 53333 (leave the use of a mobile phone)
- Alert people to surrounding areas/buildings (and, in case of a spill, also those who may be downstream of the affected area)
- Alert relevant School/Center/Institution etc.
- If safe to do so, contain the spill, fire, etc.
- Obey all directions from Security and/or emergency services

BOMB / BOMB THREATS / LIFE THREATS

- If threat is received by telephone
 - keep caller talking (do not hang up)
 - identify background if possible
 - record information for police
- Phone Security on 336 53333 and state location of threat (building, floor and room number)
- Follow instructions of person in charge and prepare to evacuate if requested
- If evacuation object to leave:
 - do not touch
 - report first
 - keep area clear

For general enquiries and non-urgent matters,
Phone Security (all hours) 336 51234

On campus, you may call UQ Security for first aid & medical emergencies. Phone: 336-53333
 UQ Security will provide first aid assistance and liaise with Emergency Services Australia if necessary.

In Australia, for [Emergency Services Australia](#)
 (Police, Fire, Ambulance)

Phone: **000** (Triple zero)





First Aid & Medical Emergencies → **IMPORTANT**

Some laboratories work with chemicals that require special first aid procedures in emergency situations (e.g. HF, Phenol).

- It is essential that you are aware of any special requirements if you work with substances that require **immediate access to specific antidotes**.
- You must ensure that required antidotes are available and that you know where they are stored.





Environmental Emergency Procedures

The *Environmental Protection Act 1994* states that everyone has a 'general environmental duty' to minimise harm to the environment.

- This includes a Duty to Notify of environmental harm.
- Always call UQ Security in the event of any **emergency – Phone: 336-53333**
- After the emergency has been resolved, you must also notify the UQ Sustainability Manager (P&F).

For additional information and contact details, refer to the UQ Guideline:

[Environmental Duty of Care and Reporting Incidents](#)





Spill Kits

Spills or emergency situations involving hazardous materials can occur at any time.

- Your lab should be prepared by having correct spill kits in appropriate locations, and have trained staff prepared to respond to an emergency situation.
- Depending on the nature of your work you may also need to have specific emergency spill procedures posted on the wall.



If working with mercury, cyanide, hydrogen fluoride or phenol a specific response should be identified in your risk assessment and the appropriate antidotes and clean up equipment must be available and up to date.



Safety Showers and Eye-Wash Stations

If your skin or eyes have come into contact with hazardous material you must:

- thoroughly wash with running water for a minimum of **20 minutes**.
- remove contaminated clothing.
- DO NOT use soap or detergent, unless stated that you should on the Safety Data Sheet (SDS).



First aid or emergency situations:

- Local first aider should obtain the SDS and follow the first aid instructions.
- Give a hard copy of the SDS to UQ Security, Ambulance Officers, and/or medical staff, if applicable.
- Obtain further medical treatment for all eye splashes.
- Obtain further medical treatment for skin splashes if irritation persists, damage is apparent, or recommended in the SDS.



Unattended Experiments

Incidents associated with your experiments may occur at night or on weekends, when you are not present.

If you must leave an experiment unattended (whether it is running or not) it must be labelled with:

- Your name
- Your contact details
- Contents / Substances
- How long it will run for
- Any hazards it presents
- Emergency instructions



You must ensure an unattended experiment is not a danger to others.



Housekeeping & Equipment Maintenance

It is important to remember that a vast majority of injuries and accidents can be prevented by following one basic rule – **GOOD HOUSEKEEPING!**

At all times, you should:

- Regularly check your work area for hazards.
- Keep lab equipment well maintained and inspected by a qualified person.
- Clean your work area on a regular basis to avoid the build-up of toxins, dusts and other substances.
- Inspect stored materials regularly, to verify container integrity.
- Clean up spilled materials immediately, and dispose of waste appropriately.
- Ensure the correct labelling of all chemicals, containers and substances.
- Keep floors clear of trip hazards e.g. empty boxes, packaging, tool & equipment, personal belongings, etc.



Common Laboratory Equipment

Laboratory Fume Cupboards

- A Fume Cupboard (FC) is a ventilated enclosure that protects you from being exposed to **hazardous chemical fumes**, gases and aerosols that are generated within the enclosure
- Protection is provided by room air that is drawn into the fume cupboard and vented to the atmosphere. The fume cupboard ventilation provides further protection by diluting the concentration of flammable gases below explosion limits.
- If you notice or suspect the airflow to be lower than usual in the fume cupboard - contact your Supervisor, Lab Manager, Floor Manager or responsible person.
- Gloves and paper towel commonly get sucked into the exhaust reducing their performance, so be careful when placing these items in the fume cupboard.



Important Note: Fume Cupboards are not suitable for working with viable biological hazards of risk group II and above.



Common Laboratory Equipment

Class II Biological Safety Cabinets

- A biological safety cabinet is the principal device used to provide containment of **infectious aerosols**.
- Aerosols can be generated from biological materials by a number of processes including centrifugation, vortexing, sonication, blending, opening containers or ampoules.
- The type of cabinet required depends on the degree of hazard.



A short video with additional information, and a demonstration of the correct use of a [Class II Biological Safety Cabinet](#), can be viewed via the OHS Website



Common Laboratory Equipment

Laminar Flow Cabinets

- A laminar flow cabinet can look very similar to a biosafety cabinet, however, works in a very different manner.
- A laminar flow works by filtering incoming air, and supplying sterile air to surfaces inside the cabinet.
- The air blows past the items in the cabinet, including open cultures, and blows the contaminated air onto the user at the front of the cabinet.
- A laminar flow is useful for keeping **non-hazardous** cultures in sterile condition i.e. protects your samples.



Laminar flow cabinet must not be used with infectious materials or those creating aerosols, as this may infect or harm a worker.



Confused about cabinets?

Fume Hood	Laminar Flow	Class II Biosafety
Draws air in	Blows air out	Circulates air within
Protects the worker	Protects the samples	Protects the worker, the samples and the environment
Commonly used for hazardous chemical work	Commonly used for seed germination studies / tissue culture	Commonly used for work with Biological / GM materials





Common Laboratory Equipment

Centrifuges

Every step is critical in preparing a centrifuge run.

Every time you use a centrifuge, you make a series of choices:

- Which centrifuge?
- Which rotor?
- Which tubes and adapters?
- What speed?
- How long?
- What level of containment?



If you are unsure ask your Supervisor, consult the operating manual, and/or call the manufacturer's representative.

Remember: Special requirements apply if you are centrifuging infectious materials.

You must fill out rotor log books, keep records of training and read and understand the risk assessment.



Common Laboratory Equipment

Microwaves

The use of microwave ovens for simple heating or defrosting in laboratories can pose a number of hazards.

To minimise the risk of these potential hazards, these rules apply:

- Never attempt to heat flammable liquids or solids, hazardous substances or radioactive materials in any type of microwave oven, whether domestic or laboratory-grade.
- Microwaves must be inspected at least annually to ensure door fit, no corrosion, no scorch marks, no burns.
- Ensure that the microwave oven cavity is adequately ventilated.
- No metal objects of any kind should be placed in microwave.
- Defects in equipment or difficulties in operation with a microwave oven should be reported promptly to the laboratory manager or supervisor.





Common Laboratory Equipment

Autoclaves

- In sterilisation facilities the hazards of heat, steam and pressure are combined in one piece of equipment - the autoclave.
- You need to be trained to operate an autoclave properly and safely.
- Autoclaving liquids require careful attention.
- All users must read and understand the relevant risk assessment, and have a training record maintained locally.
- Sterilisation of glassware requires that you load the autoclave properly. Follow the loading instructions carefully.
- Be sure to clean the drain strainer before loading the autoclave.

NOTE: You should not autoclave 10 or 20L schott bottles full of liquid





Gas Cylinder Safety

If you will be working with Gas Cylinders, you must:

- Complete the UQ online [OHS-Compressed Gases Safety](#) training module.

General Safety Considerations:

- All Gas cylinders must be **restrained** with a suitable chain.
- When moving gas cylinders, always use a **trolley** that has been made for cylinders.
- Always use a **regulator** that is suitable for the gas being used.
- Never move a gas cylinder with the regulator attached.
- Close the **valves** of any cylinders that are not in use.

For additional information, refer to the UQ PPL:

[2.70.08 Storage and Handling of Gas Cylinders](#)





Cryogenic Materials and Cold Traps

Cryogenic liquids present significant risks to the health and safety of persons who may be exposed to them.

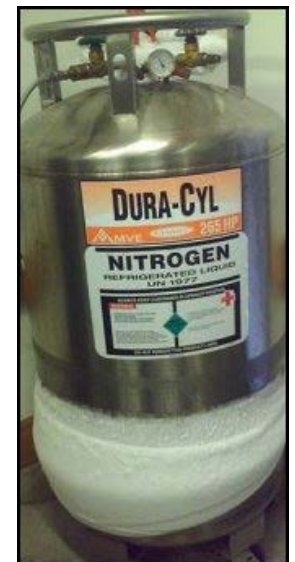
Before working with cryogenics you must complete the online [Cryogen Safety](#) module and receive training from supervisors/managers.

The hazards that may arise from the use of cryogenic materials include:

- Asphyxiation in oxygen deficient atmospheres
- Cold burns, frostbite and hypothermia
- Over pressurisation
- Combustion and explosion hazard from oxygen enrichment of atmosphere
- Catastrophic embrittlement failure

For additional information, refer to the UQ Guideline:

[Working safely with liquid nitrogen and dry Ice](#)





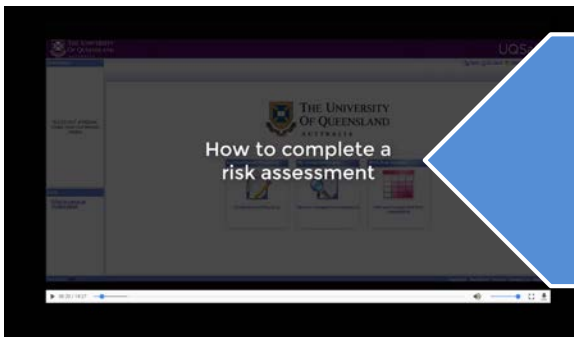
Risk Management → *completing a Risk Assessment*

A risk assessments should be completed:

- Before commencing your laboratory work tasks / activities or planning new work
- During research ethics and OGTR* approval processes
- Whenever a significant change occurs
- After an incident or an accident

** OGTR: The Office of the Gene Technology Regulator*

UQ provides an online system (UQSafe – Risk) for staff and students to complete an [OHS Risk Assessment](#) for a task, activity or project you are performing.



RECOMMENDED

[Tutorial videos](#) demonstrate the process for completing a risk assessment with step by step visual and verbal instruction.

Click here for more information about [‘When to do a risk assessment’](#).



UQ Occupational Health and Safety Division

UQ Laboratory Safety Training


OHS Specialist Advisors


UQ employs special advisors who are part of the OHS Division. OHS Advisors are available to all staff at all UQ campuses, although initial inquiry should be made to your supervisor, workplace health and safety coordinator or local manager.

They provide services to assist workers and supervisors to ensure lab safety this includes:

 **BioSafety Advisors:** To provide advice on genetically modified, quarantine and infectious materials

 **Ergonomic Advisor:** To assist with task modification or equipment to improve worker comfort.

 **Occupational Health Nurse Advisor:** to arrange health surveillance for chemical exposure and audiometry. Provision of occupational nursing services and medical treatment through the UQ Health Service.

 **Occupational Hygiene Advisors:** To provide advice on hazardous chemicals and assess/measure workplace exposure.

 **Radiation Protection Advisor:** To provide advice on all matters of radiation safety as well as assess workplace radiation exposure.



Incident Reporting

If you are injured or involved in an incident at UQ you must complete an Incident Report.

All incidents must be reported using the online Incident Reporting Database:

[UQSafe – Incident](#)



UQSafe – Incident is accessible to all staff and students.

Information regarding the incident is automatically forwarded within the UQSafe system to your nominated supervisor.



UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

Reporting Hazards → *what to do*

If you see a hazard that you can fix – then fix it!

If you cannot fix a hazard yourself, ensure that the hazard is isolated or made safe in some way until it can be rectified.

If the situation is an emergency, call UQ Security 336-53333

Report the hazard using the online Incident Reporting Database.

[UQSafe – Incident](#)



UQSafe – Incident, provides staff, students, contractors and visitors with a user-friendly way to report occupational health and safety (OHS) related hazards and incidents.

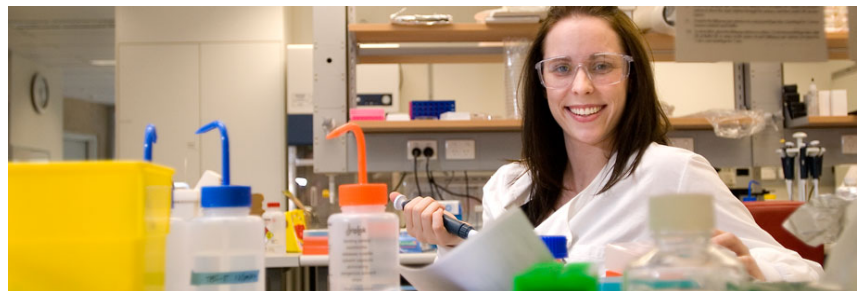
Click here for more information about reporting a hazard [What should be reported](#)



Chemical Safety Questions / Information

If you have any questions or concerns about the chemicals you are working with, you should:

- Talk to your Supervisor / Lab Manager / Work Health and Safety Co-ordinator (WHSC).
- Read the safety data sheet (SDS) and product label for the chemical/s you are working with.
- Refer to the relevant risk assessment/s for working with your chemicals.
- Attend OHS training run locally in your work area or via the UQ Staff Development.
- Complete online OHS training modules relevant to your work.
- Contact the [OHS Division](#).





Assessment

- You have now completed the University of Queensland Laboratory Safety Training module
- If you would like to revise any of the topics covered before you begin the competency assessment, please use the quick find index to navigate to a particular topic
- You will be asked a set of 20 randomly selected questions. The pass mark is 80%. You may repeat the test as many times as you require. Each time you attempt the assessment, you will be presented with a different set of questions



UQ Occupational Health and Safety Division

UQ Laboratory Safety Training

Assessment Location

You can return to eLearning@UQ (Blackboard) at any time to complete the assessment.

Or,

You can complete the assessment now by selecting this link:

[[Start Assessment](#)]

The screenshot shows a web browser window displaying the Blackboard Learn interface. The browser's address bar shows the URL: https://learn.uq.edu.au/webapps/portal/frameset.jsp?tab_tab_group_id=_2_1&url=%2Fwebapps%2Fblackbo. The page header includes the University of Queensland logo and the text 'eLearning@UQ'. The main content area is titled '** Assessments **' and lists five assessments, each with a '20 questions - pass mark is 80%' note. The assessments are: General Workplace Safety Assessment, Annual Fire Safety Assessment, Biosafety Assessment, Laboratory Safety Assessment, and Chemical Safety Assessment. In the left sidebar, the 'Assessments' link is circled in red.