

<b>Name of Guideline</b>	<b>ACU Laboratory Safety Guidelines - Interim</b>	
<b>Description of Guideline</b>	The purpose of these guidelines is to provide for a safe working environment when persons are in ACU Laboratories as well as providing practical OHS guidance for all who may be required to visit, work or learn in any laboratory that is under the control of ACU.	
<input type="checkbox"/> New Guideline	<input checked="" type="checkbox"/> Revision	
<b>Description of Revision</b>		

### Human Resources Directorate

<b>Policy and Revision Number</b>	
<b>Original Effective Date</b>	April 2009
<b>Review Due Date</b>	
<b>Revision Effective Date</b>	27 October 2010
<b>Senate Approval Date</b>	
<b>Vice Chancellor's Approval Date</b>	27 October 2010

## Table of Contents

1	Background Information	1
1.1	Key Definitions	1
1.2	Statutory Requirements	3
2	Policy Statement	3
3	Guideline Purpose	4
4	Application of the Guidelines	4
4.1	Responsibilities	4
5	Approvals	8
6	Laboratory Safety Procedures	8
6.1	Manual Handling	8
6.2	Medical/Other Conditions	8
6.2.1	Administration of Medical Disclosure Documents	9
6.3	Mouth Pipetting	9
6.4	Housekeeping	9
6.5	Laboratory Security	10
6.6	Laboratory Emergency Management	10
6.6.1	Accident Reporting	11
6.6.2	Dangerous Goods Emergencies	11
6.6.3	Spills Management	12
6.6.3.1	Chemical spills	13
6.6.3.2	Biological Spills	13
6.6.3.3	Mercury Spills	13
6.6.4	Needle-stick/Sharps/Biological Exposure	14
6.6.5	First Aid	14
6.7	Safety Equipment	15
6.8	Risk Management and Assessment	15
6.9	Laboratory Safety Inductions	16
6.10	General Laboratory Safety	17
6.10.1	General Equipment	17
6.10.2	Fume Cupboards	17
6.10.3	Autoclaves	18
6.10.4	Bio-Safety Cabinets	18
6.10.5	Refrigeration	19
6.10.6	Electrical Equipment	19
6.10.7	Glassware	19
6.10.8	Gas Cylinders	20
6.11	Chemical Safety	20
6.12	Biological Safety	21
6.13	Disposal of Laboratory Waste	22
7	Policy Review	22
8	Further Assistance	22
9	Attachments	23
	<i>Appendix 1 - References and Publications (Laboratory Safety)</i>	24
	<i>Appendix 2 – Types of Fire Extinguishers</i>	27
	<i>Appendix 3 – Classification of Dangerous Goods</i>	28
	<i>Appendix 4 – Suggested Medical Disclosure Form</i>	31
	<i>Appendix 5 - Laboratory Safety Induction Checklist</i>	32
	<i>Appendix 6 - Laboratory Safety Assessment Form</i>	34
	<i>Appendix 7- Laboratory Risk Assessment Checklist</i>	40
	<i>Appendix 8 – Risk Assessment Tool for Practical Activities/Experiments</i>	46
	<i>Appendix 9 – Chemical Risk Assessment Worksheet</i>	50
	<i>Appendix 10 - Guidelines for Developing Safe Laboratory Practices in ACU Anatomy Laboratories</i>	53

## 1 Background Information

The Australian Catholic University (ACU) aspires to continuously improve the management and standards of Occupational Health and Safety. This extends to minimising where practicable, the risks associated with access to, and use of, laboratories by restricting access to competent persons or to those who are supervised by them.

The teaching and research activities undertaken in laboratories are complex, and may include the use of hazardous substances and materials (e.g. corrosive, flammable and poisonous chemicals, sharp objects, biological hazards, electricity and compressed gases). Any of these activities can be potentially hazardous unless conducted in a safe manner using, where possible, best practice.

Accordingly, the process/procedures described in this guideline should be seen as the first step in implementing safe systems of work for the management of risks within a laboratory and/or workshop, and to assist the University in meeting its legal obligations under the various State and Federal OHS Legislative and regulatory jurisdictions.

### 1.1 Key Definitions

<b>Term</b>	<b>Definition</b>
<b><i>Accident</i></b>	An unplanned event which causes injury, death and/or damage to equipment or property.
<b><i>Aerosol</i></b>	is a suspension of solid or liquid particles in a gas. Particles in suspension must, of course, be small, or they would settle out under the influence of gravity; typical diameters range from about 0.001 micrometres to about 100 micrometres, and the density of the suspended particles may range from extremely small values up to around 10 grams per cubic metre of gas.
<b><i>Bio-hazardous Waste</i></b>	This can include infectious material, contaminated agar plates, live cultures, human cells and blood, and disposables.
<b><i>Biological Hazard (Biohazard)</i></b>	Can be defined as any micro-organism, cell culture, or human endoparasite, which may cause any infection, allergy, toxicity or otherwise create a hazard to human health. These include viruses and bacteria which can cause infection and disease, dangerous plants and animals (for example parasites or insects), biologically contaminated dusts, or wastes from humans and animals.
<b><i>Biological Spill</i></b>	Spills of biologically hazardous materials can be divided into two distinct types - minor and major spills. Several factors determine whether a spill is minor or major, these include: <ul style="list-style-type: none"> <li>• how infectious the material is;</li> <li>• the volume of the spill; and</li> <li>• most importantly how much aerosol was produced when the spill occurred.</li> </ul> <p style="text-align: center;">Minor Spills (including "spot" spills) include:</p> <ul style="list-style-type: none"> <li>• a minimally hazardous material that is spilled without generating infectious aerosols; and</li> <li>• where the spill is up to 10 cm in diameter.</li> </ul> <p style="text-align: center;">Major spills include:</p>

	<ul style="list-style-type: none"> <li>• where a known or suspected/potentially infectious material is spilled;</li> <li>• a spill of material which generates infectious aerosols; or</li> <li>• any spills greater than 10cm in diameter.</li> </ul>
<b>Biological Waste</b>	Any material potentially contaminated with microorganisms including human tissues, blood, body fluids and animal carcasses. Biological materials of animal, human, plant or microbial origin.
<b>Carcinogens</b>	Are substances which have the ability to cause cancer.
<b>Chemical Spill</b>	Is taken to have occurred when any quantity of chemical drops, leaks, overflows or, by any other means, touches any place other than the place intended for the chemical.
<b>Chemical Waste</b>	<p>Includes solvents, acids, alkalis, toxic materials, photographic chemicals, paints, contaminated glassware and consumables, and laboratory chemicals that are no longer required or have deteriorated with age. The majority of chemical waste generated is:</p> <ul style="list-style-type: none"> <li>• Class 3 – Flammable Liquids (e.g. acetone, ethanol, ether, hexanes, xylene).</li> <li>• Class 6.1 – Toxic Substances (e.g., dichloromethane, chloroform, phenol).</li> <li>• Class 8 – Corrosives Substances (e.g. acids, alkalis).</li> </ul> <p>Waste products derived from hazardous substances often have similar hazard characteristics to the hazardous substance from which they were derived, so appropriate consideration must be given to the packaging, labelling, handling and storage of waste products, just as for other hazardous substances. The requirements for the storage of chemical waste are similar to the requirements for the storage of hazardous substances and dangerous goods.</p>
<b>Dangerous Goods</b>	Are substances or articles that pose a risk to people, property or the environment, due to their chemical or physical properties. Dangerous goods are usually classified with reference to the immediate hazard they pose rather than the long-term health effects.
<b>Hazard</b>	<p>A source or a situation with a potential for harm in terms of human injury or ill health, damage to property, damage to the environment, or a combination of these. (AS4804)</p> <p>This can include chemical substances, plant, machinery, work processes, manual handling and/or other aspects of the work environment.</p>
<b>Hazardous Substances</b>	Are substances which have the potential to harm the health of people and the effects are generally over long-term use.
<b>Injury</b>	Any physical or mental damage to the body caused by exposure to a hazard.
<b>Laboratory</b>	<p>"Means any building or portion of a building used, or intended to be used, for any practical scientific work which may be hazardous, including research or the teaching of sciences. Such work may involve the use of chemicals, flammable liquids, pathogens, other harmful substances, harmful radiation, or processes including electrical or mechanical work which would be hazardous unless carried out in a specifically designed area. The laboratory area includes support areas such as instrument and preparation areas, laboratory offices, and laboratory stores (AS2243.1-1990)."</p> <p>Laboratory space for the purposes of this guideline includes:</p>

	<ul style="list-style-type: none"> <li>• Anatomy/Science Laboratories;</li> <li>• Photographic and Visual Arts Studios;</li> <li>• Technology and Textile Workshops;</li> <li>• Bio-mechanical Laboratories;</li> <li>• Computer Laboratories; and</li> <li>• Clinical Nursing Laboratories.</li> </ul>
<b>Material Data Safety Sheets (MSDS)</b>	A document provided by the manufacturers and suppliers describing the properties and uses of a substance including its chemical and physical properties, potential hazards to health, precautions for use, first aid requirements and emergency procedures.
<b>Needle-stick Injury</b>	An injury caused by a sharp object, such as a needle or scalpel blade, penetrating the skin. If the sharp object is contaminated by blood, blood products or body fluids of human origin, there is a risk of transmission of blood-borne infections such as Hepatitis B and HIV.
<b>Personal Protective Equipment (PPE)</b>	Equipment that must be worn by persons who enter, work or learn in laboratories and associated facilities. The type of PPE required (e.g. safety glasses) will be determined by the nature of the work and the risk management process.
<b>Poisons</b>	Includes those substances listed as Scheduled Poisons under the Poisons and Therapeutic Goods Act.
<b>Risk Management</b>	The process of identifying, quantifying and prioritising potential risks and their associated losses, and developing cost-effective management strategies to assume control of or eliminate these costs or losses.

## 1.2 Statutory Requirements

ACU Laboratory Safety Policy and Guideline has been developed to meet as far as practicable, the Australian OHS statutory requirements listed below, the associated State OHS regulations, various State-based Codes of Practice, National OHS Standards and Australian/New Zealand Standards including AS 2243 – *Safety in Laboratories, Parts 1-10*:

- Australian Capital Territory      Occupational Health and Safety Act 1989
- New South Wales:                    Occupational Health and Safety Act 2000
- Queensland:                            Workplace Health and Safety Act 1995
- Victoria:                                 Occupational Health and Safety Act 2004

The University is also required to meet Federal and State legislative requirements relating to dangerous goods and hazardous materials. [Appendix 1](#) lists a number of references relating to Australian statutory and regulatory requirements for Laboratory Safety.

## 2 Policy Statement

The University acknowledges its responsibility to protect the safety and health of staff, students, contractors and visitors in laboratories and undertakes to comply, as far as is practicable, with the provisions of *Australian Standard 2243 – Safety in Laboratories*. Consistent with this, ACU will endeavour to ensure that all reasonably foreseeable risks to health and safety in laboratory work are identified, and management strategies put into place to eliminate or minimise such risks.

ACU will work as far as is practicable towards compliance with all relevant legislation and standards so that exposure of persons to health and safety risks arising from laboratory activities is avoided or minimised. This is to be achieved by effective control of hazards related to laboratory work.

The principles of risk management should be applied to all laboratory work, namely:

- Hazard identification, through inspection of the laboratory and associated project proposals;
- Risk assessment, through the review of health and safety information; and
- Risk control, through providing appropriate facilities, induction and training.

This Policy and Guideline should be provided to all persons working in research and teaching laboratories across ACU. Before they begin work in a laboratory or a laboratory area new to them, staff and students should be made familiar with the contents of the relevant laboratory safety manual

A Laboratory and Bio-Safety Focus Group, comprising a nominated representative<sup>1</sup> from each campus and the OHS and Wellbeing Coordinator, acting as the Executive Officer, will be established to oversee and monitor, via quarterly meetings, the implementation and review of the ACU Laboratory Safety Guidelines. The Focus Group will provide specialist advice in relation to laboratory safety and will also report, as required, on strategic laboratory safety matters to Heads of School, Campus OHS Committees and the ACU Staff Consultative Committee.

Individual Campus OHS Committees are encouraged to establish campus-specific Laboratory Safety Focus Groups to assist Faculties/Schools in developing campus/laboratory-specific safety procedures and in the conduct of laboratory risk assessments and laboratory safety inspections/audits and also to provide advice and information to the National Laboratory and Bio-safety Focus Group.

### **3 Guideline Purpose**

The purpose of these guidelines is to provide for a safe working environment when persons are working in ACU Laboratories as well as providing practical OHS guidance for all who may be required to visit, work or learn in any laboratory that is under the control of ACU.

### **4 Application of the Guidelines**

The approach described in these guidelines applies to laboratory safety at all the Australian campuses of the Australian Catholic University and to all the University's controlled entities.

The Guidelines have particular relevance for managers, supervisors and staff members who have responsibility for overseeing the activities of other staff, visitors, contractors and/or students in University laboratories. University staff members with supervisory authority are required to ensure that these guidelines are effectively implemented in their designated areas of responsibility.

Furthermore, as these Guidelines provide overall guidance on laboratory safety, it is expected that individual Faculties and Schools will develop and implement local laboratory safety guides and instructions that are designed to meet their specific needs but remain compatible with these guidelines.

#### **4.1 Responsibilities**

---

<sup>1</sup> The Campus Representative may be either an academic with laboratory teaching responsibilities or a laboratory technical staff member. Observers and/or specialists would be invited to assist the Focus Group as required. Terms of Reference will be prepared and the Focus Group will be a sub-committee of the ACU Staff Consultative Committee.

The University recognises that the effective provision of safe work environments and safe systems of work place reciprocal responsibilities on staff, management, students, visitors and contractors. Those responsibilities are outlined below:

Stakeholder	Responsibilities/Roles
<b>ACU</b>	<ul style="list-style-type: none"> <li>✓ Fulfil its legal obligations under State and Territory OHS legislation and Australian standards.</li> <li>✓ Ensure that OHS safety standards and practices are implemented and maintained in laboratories across ACU in a consistent manner.</li> <li>✓ Ensure the sufficient allocation of resources to develop, implement and monitor the strategies, systems and procedures required for laboratory safety.</li> </ul>
<b>Managers/Supervisors/Deans/ Heads of Schools</b>	<ul style="list-style-type: none"> <li>✓ Implement these guidelines equitably and fairly and ensure that all staff and students are aware of its content.</li> <li>✓ Develop a laboratory safety induction package for staff and students. Schools are encouraged to develop on-line induction packages.</li> <li>✓ Ensure that all staff and students receive induction training regarding safe laboratory practice that also includes information pertaining to emergency response procedures and personnel.</li> <li>✓ Ensure that a laboratory safety manual is maintained for each laboratory and is as up to date as possible.</li> <li>✓ Ensure that adequate financial resources are made available for OHS and safety equipment and materials and the maintenance of OHS standards.</li> <li>✓ Ensure that hazard identification and risk assessment procedures are developed, documented and maintained for the safe use, handling, storage, transport and disposal of hazardous equipment, materials and substances and that appropriate risk controls are implemented and maintained.</li> <li>✓ Ensure that accidents/incidents within their area of responsibility are reported to Campus Operations using the <a href="#">Accident and Incident Report Form</a>.</li> </ul>
<b>Laboratory Managers/Laboratory Technical Staff</b>	<ul style="list-style-type: none"> <li>✓ Monitor compliance with these guidelines and report instances of non-compliance. In conjunction with the local Campus Operations unit, develop, implement and regularly test appropriate laboratory specific emergency plans.</li> <li>✓ Ensure that staff and students have access to and are advised/instructed to wear the appropriate personal protective equipment whilst in the laboratory.</li> <li>✓ Ensure that effective protocols are developed, implemented and monitored for the safe handling, storage, transport and disposal of hazardous equipment, materials, substances and wastes.</li> <li>✓ In conjunction with academic staff, conduct risk assessments on work (including all experiments and practicals) performed in the laboratory.</li> <li>✓ Liaise with Campus Operations and outside contractors (where necessary) to ensure that all</li> </ul>

Stakeholder	Responsibilities/Roles
	<p>laboratory and safety equipment is tested and properly maintained in accordance with legislative and manufacturers' requirements.</p> <ul style="list-style-type: none"> <li>✓ Arrange for laboratories to be secured at the end of a laboratory session.</li> <li>✓ Ensure that all accidents/incidents within their area of responsibility are reported to Campus Operations using the <a href="#">Accident and Incident Report Form</a>.</li> </ul>
<b>Academic Staff</b>	<ul style="list-style-type: none"> <li>✓ Monitor compliance with these guidelines and report instances of non-compliance.</li> <li>✓ Ensure that students receive the appropriate information, instruction and supervision to carry out laboratory practicals safely.</li> <li>✓ Ensure that safe work practices are developed, implemented and monitored.</li> <li>✓ Ensure students follow laboratory rules (including being appropriately dressed and wearing appropriate protective clothing/equipment). Students who do not meet dress requirements should be excluded from the laboratory.</li> <li>✓ Actively practice and develop in students, proper attitudes towards health and safety matters.</li> <li>✓ Ensure that a suitably qualified and/or experienced person is present in all practical classes at all times.</li> <li>✓ Ensure that risk assessments of all practical classes are undertaken, particularly if new equipment and/or process are being introduced into practical sessions. See <a href="#">Appendix 8</a> for a copy of a suggested risk assessment form for use.</li> <li>✓ Arrange for laboratories to be secured at the end of a laboratory session.</li> <li>✓ Ensure that accidents/incidents within their area of responsibility are reported to Campus Operations using the <a href="#">Accident and Incident Report Form</a>.</li> </ul>
<b>Contractors</b>	<ul style="list-style-type: none"> <li>✓ Consult with laboratory managers/technical staff and/or responsible academic staff prior to the commencement of work in University laboratories to ensure that the area is rendered safe to undertake the contracted/scheduled works.</li> <li>✓ Employ safe work practices while on University premises.</li> </ul>
<b>Undergraduate/Postgraduate Students and Visitors</b>	<ul style="list-style-type: none"> <li>✓ Take reasonable care of their health and safety and acknowledge that they have a responsibility for the health and safety of others.</li> <li>✓ Follow laboratory rules (including being appropriately dressed and wearing appropriate protective clothing/equipment). Students who do not meet dress requirements must be excluded from the laboratory.</li> <li>✓ Are conversant with the laboratory safety guideline for their particular laboratory as well as emergency and evacuation procedures for the laboratory.</li> <li>✓ Are conversant with the procedures for correct use of safety facilities and equipment and always use the appropriate safety equipment in the correct manner.</li> <li>✓ Adhere to acceptable housekeeping standards.</li> <li>✓ Understand the risk assessments that are relevant</li> </ul>

Stakeholder	Responsibilities/Roles
	<p>to their practicum or research work and are able to implement appropriate risk controls.</p> <ul style="list-style-type: none"> <li>✓ Comply with the instructions given by emergency response personnel such as floor wardens and first-aid officers to ensure that they do not endanger themselves or others.</li> <li>✓ Report all incidents, hazards and 'near miss' incidents to their supervising lecturer or laboratory technical staff.</li> <li>✓ Seek information or advice where necessary before carrying out new or unfamiliar work.</li> </ul>
<b>Campus Operations</b>	<ul style="list-style-type: none"> <li>✓ Liaise with laboratory and academic staff to ensure that all laboratory and safety equipment is regularly tested and maintained in accordance with legislative and manufacturers' requirements.</li> <li>✓ Inform laboratory managers and/or responsible academic staff of the nature of any scheduled works.</li> <li>✓ Ensure that contractors strictly adhere to OHS legislative and regulatory requirements and that they and their sub-contractors hold the appropriate licences, permits, certificates of competency and accreditations to under-take the work.</li> </ul>
<b>OHS and Wellbeing Coordinator</b>	<ul style="list-style-type: none"> <li>✓ Take responsibility for overall coordination and monitoring of the ACU Laboratory Safety Guidelines including the identification of training in hazard and risk management processes.</li> <li>✓ Act in an advisory capacity as required.</li> <li>✓ Work with the Laboratory and Bio-safety Focus Group.</li> </ul>
<b>OHS Committees, Health and Safety Representatives, Laboratory and Bio-Safety Focus Group</b>	<ul style="list-style-type: none"> <li>✓ Monitor and ensure that these guidelines are implemented consistently across ACU by including laboratory inspections in their annual program of workplace inspections.</li> <li>✓ Ensure that Faculties and Schools conduct appropriate risk assessments and identify hazards, including regular inspections of laboratory facilities and the development, implementation and testing of emergency procedures for laboratories through the receipt, tabling and discussion of laboratory inspection report summaries at Local OHS Committee meetings. Health and Safety Representatives have the right to be consulted, so far as reasonably practicable, on the risk assessment of new and existing materials, equipment, work practices and procedures that may affect the health and safety of staff.</li> <li>✓ Laboratory and Bio-safety Focus Group (contact details listed for Focus Group on HR Directorate website) will: <ul style="list-style-type: none"> <li>○ regularly review and recommend updates to the Laboratory Safety Guidelines based on the latest developments in the field;</li> <li>○ provide advice and guidance on all safety matters as they relate to laboratory and bio-safety;</li> <li>○ provide advice and guidance on the handling</li> </ul> </li> </ul>

Stakeholder	Responsibilities/Roles
	and storage of hazardous substances; and <ul style="list-style-type: none"> <li>○ monitor risk assessment and hazard identification including the hazardous substances register.</li> </ul>

## 5 Approvals

All approvals of decisions made in relation to the reporting and notification of hazards, the documentation and analysis of risk assessments and the implementation of risk control measures to eliminate or mitigate risks and hazards within ACU laboratory's which have cost implications, must be made in accordance with the University's Staffing Delegations Register.

## 6 Laboratory Safety Procedures

There is a significant level of risk associated with staff, students and visitors being given general access to laboratories if they are not sufficiently familiar with the correct operating procedures and safety requirements for laboratory machinery/equipment processes. The following safety procedures outline the requirements for operating within University laboratories. The procedures outlined below should be incorporated into laboratory specific safety manuals developed by Faculties and Schools and also used in conjunction with all other relevant University policies and procedures (e.g. [ACU Accident Reporting Guideline](#)) available on the Human Resources Directorate OH&S Website.

### 6.1 Manual Handling

Heads of School and laboratory managers should take all reasonable steps to ensure workplace compliance with the *National Standards for Manual Handling and Code of Practice for Manual Handling*, WorkSafe Australia, Australian Government Publishing Service, Canberra, February 1990. Staff and, where necessary, students should, therefore, be familiar with manual handling techniques, the correct use of mechanical aids and team lifting procedures appropriate to the activities undertaken in laboratories.

### 6.2 Medical/Other Conditions

In order to assist the University assess the capacity of staff, students, contractors and visitors to participate safely in activities in the University's laboratories and workshops all such individuals are required to disclose any medical condition or disability, which may affect their capacity to so participate by completing the Medical Disclosure Form shown at [Appendix 4](#).

If staff, students, contractors or visitors become aware of any medical condition or disability which may affect their capacity to participate safely in laboratory or workshop activities (including operating laboratory equipment as may be required from time to time) they should immediately advise the relevant Course Coordinator or Laboratory Supervisor as soon as practicable, the individual should also complete an updated Medical Disclosure Form.

Staff, students, contractors and visitors also have an obligation to ensure their own health and safety and that of others. In order to meet these obligations (and to assist the University to meet any obligations it has), individuals should also speak with the Course Coordinator or Laboratory Supervisor if they:

- **are pregnant** - hazardous materials used in a laboratory/workshop can potentially harm the foetus.

- **have any temporary or permanent medical condition or disability or impairment** which may impact their capacity to safely participate in laboratory or workshop activities (including operating laboratory equipment as may be required from time to time).
- **are taking any medication (whether prescribed or not)** which may affect their capacity to safely participate in laboratory or workshop activities (including operating laboratory equipment as may be required from time to time) – e.g. by affecting mental alertness and/or coordination (such as medication which includes a warning label related to operating equipment or driving a motor vehicle).

If a student has a medical condition, impairment or disability which may affect their capacity to safely participate in laboratory or workshop activities, and the student wishes to participate in such activities, the student should discuss the situation with their local Campus Disability Advisor. Alternatively, if a staff member has a medical condition, impairment or disability which may affect their capacity to participate in laboratory or workshop activities and if they wish to participate in such activities, the staff member should contact their local Campus HR Consultant.

In conjunction with the student, the Disability Adviser will work to see what reasonable accommodations (if any) can be made to allow the student to safely participate in the laboratory or workshop activity. Depending on the circumstances, the Disability Adviser may develop an Education Inclusion Plan (EIP) in conjunction with the student which sets out any reasonable adjustments which may be made to accommodate the disability or condition in the circumstances. EIPs may be updated from time to time.

### 6.2.1 Administration of Medical Disclosure Forms

Heads of School are to ensure that all completed Medical Disclosure Forms for both staff and students are placed in a sealed envelope marked **Private & Confidential**. The completed forms in their sealed and privacy-marked envelopes are to be managed as follows:

- **Students** – The sealed envelopes may, if necessary, be marked for the attention of course coordinator/laboratory supervisor. All completed student forms in their sealed envelopes should be forwarded to the local campus student centre for placement on the student's file. If a student discloses a disability, then a copy should be provided to the local campus Disability Adviser (unless the student objects to such disclosure as indicated in the Medical Disclosure Form).
- **Staff** – The sealed envelopes may, if necessary, be marked for the attention of the course coordinator. All completed forms in their sealed envelopes should be forwarded to the Human Resources (HR) Directorate, Strathfield Campus for placement on the staff member's personnel file.

A copy of the completed Medical Disclosure Form is also to be retained by the Head of School.

All medical information disclosed will be used only for the purpose for which it was collected and will not be disclosed to other parties (other than ACU Disability Advisors, in accordance with ACU's Privacy Policy or unless permitted by law) without the consent of the person making the disclosure.

The Medical Disclosure Form is shown at [Appendix 4](#).

### 6.3 Mouth Pipetting

Mouth pipetting of any substances is prohibited at all times in all laboratories.

### 6.4 Housekeeping

Housekeeping is an important component in laboratory safety to ensure that the risk of injury from potential hazards in a laboratory environment is controlled. It is highly recommended that the following precautions are included in Faculty/School laboratory manuals to ensure the safety of staff, students and visitors within laboratories:

- Floors are kept tidy and dry.
- Benches are kept clean and free from chemicals and apparatus that are not being used;
- Aisles and exits are kept free from obstructions.
- Bottles and glassware are kept off the floor.
- Access to all emergency equipment (fire extinguishers, first aid kits, chemical spill kits, emergency showers and eye washes) is kept free from obstruction.
- Work areas and equipment are thoroughly cleaned after use.
- For the last person to leave the laboratory equipment is turned off, flames are extinguished etc.
- The interior of fume cupboards and nearby areas are kept clean.
- All apparatus left running overnight is shielded and labelled with name and telephone number of person to be contacted if required.
- If contractors are working in a laboratory, any hazards which may exist are made known to them, e.g. flammable liquids.

## 6.5 Laboratory Security

Laboratory security plays an important role in ensuring unauthorised persons cannot readily access hazardous equipment, materials and substances. Accordingly, access to laboratories should be restricted to staff and students who have been trained and are proficient in the operations of the laboratory's machinery/equipment processes and who have a sound knowledge of the required safety procedures. Other staff or students wishing to undertake routine tasks in a laboratory are also permitted access provided they are working under the direct supervision of a fully competent person. People who are behaving in a manner that could compromise security or safety within a laboratory or associated facility should be requested to leave.

Children are not generally permitted in University laboratories. Please refer to [ACU Interim Policy - Children on University Premises for more detail](#).

The windows and doors of all laboratories must be kept locked and secure at all times when the laboratory is not in use. Under no circumstances should security, fire or self-locking doors be propped open.

Particular areas of a laboratory, e.g. store rooms, fridges, freezers and steel cages, have been designed, constructed and installed to improve the storage and security of hazardous equipment, substances and materials. These storage facilities should therefore be locked at all times when not in use. Staff must ensure that hazardous substances, equipment and materials are handled and stored correctly so that at all times the risk of injury to persons and/or their theft from a laboratory is minimised. Up-to-date inventories of hazardous substances, materials and equipment should be maintained and regularly audited by laboratory technical staff.

## 6.6 Laboratory Emergency Management

Staff and students should be aware that there are risks involved in taking any laboratory class - e.g. risks of personal injury through accidents, manual handling, exposure to chemicals, radiation or bio-hazardous materials. Consequently, they should be familiar with

the emergency procedures for their particular campus. Also, they should refer to [ACU's Emergency and Critical Incident Policy](#) (readily accessible on the HR website) for information on how to handle certain emergency situations.

Heads of School should ensure that laboratory inductions<sup>2</sup> inform participants of the location and the correct use of safety equipment. As such, staff and students should be aware of:

- All emergency exits and nearest telephone (emergency phone number list should be prominently displayed);
- Fire alarms, fire extinguishers (type and their use – see [Appendix 2](#) for more information), fire blankets and sand buckets;
- Safety showers and eyewash facilities;
- First Aid Officers and kits;
- Floor Wardens; and
- Material Safety Data Sheets (MSDS).

In the event of an emergency, staff and students should cooperate fully with key emergency personnel such as First Aid Officers, Floor Wardens and emergency services personnel.

Laboratory managers, academics in charge of practical classes and Heads of School are responsible for ensuring that measures are taken to assess the nature and extent of risks posed by hazards and processes carried out in their laboratory and/or ensure that an effective emergency management plan is developed, implemented and tested. The emergency plan should be compatible with their local campus Emergency and Evacuation Procedures. Laboratory Emergency Plans should also include procedures for handling dangerous goods emergencies.

### **6.6.1 Accident Reporting**

All persons at a workplace are responsible for recording and reporting incidents involving students, staff and visitors. All incidents/accidents/near misses should be reported using the [Accident and Incident Report Form](#). Students should report any incident in the first instance to staff, who then should report the incident using the [Accident and Incident Report Form](#). Where required, First Aid assistance should be provided by a designated Campus First Aid Officer or by an appropriately trained staff member and, where necessary, emergency services called.

If the injury is serious or fatal or the incident is considered dangerous, then State OHS Statutory Authorities may need to be informed. Please refer to the [ACU Accident Reporting Guidelines](#) for further information on the statutory reporting requirements of accidents.

### **6.6.2 Dangerous Goods Emergencies**

Dangerous goods emergencies (see [Appendix 3](#) for details relating to the classification of Dangerous Goods) usually involve the spill, leakage or escape of a dangerous substance thereby creating additional risks for persons in the immediate area.

All laboratories must make arrangements for emergencies, regardless of the quantity of dangerous goods held. Emergency procedures should be developed on the basis of needs as indicated by a risk assessment. This may include the assessment of:

- the nature and quantity of dangerous good stored or handled;
- the type(s) and likelihood of emergencies;
- the fire protection and other emergency equipment provided;
- the physical features of the laboratory and its facilities;
- ease of access to the laboratory by emergency services; and
- the number of people likely to be on the premises or adjoining premises.

---

<sup>2</sup> Schools have the option of conducting face-to-face or on-line inductions.

Laboratory managers are responsible for ensuring that appropriate emergency management information is readily available and prominently displayed.

Faculties and Schools are strongly encouraged to base their dangerous goods emergency protocols on the Australian Standards Handbook HB 76-2004 "*Dangerous Goods – Initial Emergency Response Guide*" which recommends a six-step approach to dangerous goods incidents as per the table below:

Approach	Comments/Considerations
<b>1. Raise the alarm</b>	Always advise someone including emergency services of the emergency before attempting to control situation.
<b>2. Secure the area</b>	Especially if unable to identify the nature of the material(s) and its hazards and contact emergency services.
<b>3. Approach with care</b>	Minimise exposure to the hazards by wearing the appropriate personal protective equipment and avoiding inhalation of gases, fumes and smoke. Work upwind if the emergency is in a ventilated or outdoor area.
<b>4. Identify products</b>	Use storage containers, dangerous goods class labels, Material Safety Data Sheets and placards to gather information.
<b>5. Assess the situation</b>	Knowledge of physical and chemical properties will help determine the appropriate response and evacuation procedures. Remember that some harmful gases are colourless and odourless.
<b>6. Respond accordingly</b>	If safe to do so, decontaminate equipment, clothing and persons, including victims, Safely dispose of contaminated materials or seek advice from manufacturer or government agency, e.g. EPA. If human exposure occurred seek medical assistance immediately and provide details. Report incident using <a href="#">Accident and Incident Report Form</a> .

### 6.6.3 Spills Management

Spills in the laboratory may range from a minor incident to a significant hazardous event that may result in a person(s) and/or the environment being harmed. Spills emergency plans must be developed, where applicable, for all laboratories and personnel trained in how to implement the plan(s) and specific procedures that must be followed. MSDS must be readily accessible for all chemicals used in the laboratory. Information regarding how to manage spills should be read and understood by all staff and students who work or learn in a laboratory.

The method(s) and material(s) used for spill containment will be dependent upon a number of key factors which may include but are not limited to:

- the toxicity of the substance;
- nature and type of substance;
- size of the spill;
- location of the spill;
- consequences of the spill;
- compatibility with other goods that could be spilt; and
- the availability or otherwise of emergency services.

All laboratories should be provided with a spill kit appropriate to control the risk associated with a spill of the type of hazardous material(s) (e.g. chemical, biological or mercury) being used in the laboratory. Notwithstanding the outcome of a laboratory risk assessment, spill kits must (as a minimum) contain appropriate personal protective equipment, absorbents and neutralisers. To ensure serviceability, all spill kits should be checked on a regular basis by laboratory technical staff. Commercially available kits may be purchased or may be prepared by laboratory/academic staff after referring to appropriate MSDS or other manufacturer or supplier specifications/materials associated with the hazardous material(s).

If a spill does occur students should immediately notify their supervising staff member or laboratory technician. An [Accident and Incident Report Form](#) should be completed.

#### **6.6.3.1 Chemical Spills**

Any person(s) in control of premises where chemicals are stored or handled must ensure that provisions are made for the containment of potential spills or leaks. This includes the provision of appropriate spill kits, spill clean up teams, emergency spill procedures etc.

All chemical spills and leaks must be contained safely within a limited area of the premises as far as is reasonably practicable. Any area or receptacle intended to contain spills or leaks must not be shared with any other substance(s) that are not compatible with the chemical to be contained.

Immediate action is to be taken (by the person(s) noticing the spill) to implement an effective clean up protocol as detailed in the laboratory's safety manual.

In the event of a spill or leak:

- any risk associated with the spill or leak must be immediately reduced; and
- the chemicals and resulting effluent must be cleaned up and disposed of or made safe as far as is reasonably practicable.

All spill incidents must be reported to laboratory staff so that the circumstances that led to the spill can be determined and remedial measures implemented to prevent a recurrence.

#### **6.6.3.2 Biological Spills**

Biological spills may contain potentially pathogenic microorganisms and/or other bio-hazardous materials such as specimens of human origin (e.g. blood, tissues), and/or other potentially infectious or hazardous biological material (e.g. animal blood or tissues).

Biological spills must be dealt with immediately to minimise the risk of infection and contamination. Appropriate personal protective equipment should be worn when cleaning such spillage.

#### **6.6.3.3 Mercury Spills**

All laboratory facilities using mercury or mercury-filled equipment should ensure that appropriate spill kits are readily accessible and staff/students trained in the proper procedure to follow in the event of a mercury spill. Commercial mercury spill kits are available for purchase and should be considered in laboratories where mercury or mercury filled equipment are used. It is highly recommended that the clean-up procedures (depending on the size of the spill) include actions such as the:

- isolation of the of the immediate area;
- consideration of evacuating the area if a large area is contaminated or ventilation is inadequate;

- use of appropriate personal protective equipment by all personnel involved in the clean up;
- use of a wet towelling, adhesive, pasteur pipette or vacuum pump if the spill is only a few droplets; and/or
- collection of large droplets using a scraper for larger spills, with the resulting pool collected using a vacuum pump or industrial vacuum cleaner fitted with a charcoal filter trap;and
- the placement of the mercury waste in approved and labelled containers and disposed of appropriately.

#### 6.6.4 Needle-stick/Sharps/Biological Exposure

Laboratories may contain a number of biological hazards that have the potential to cause harm. These include specimens of human origin (e.g. blood, blood products, other body fluids). Specific protocols should be developed and implemented by laboratory managers to manage injuries and biological exposure such as those caused by needle-stick, sharps, or mucous membrane exposure to human blood or other body fluids.

Typically, a needle-stick or sharps injury response plan would set out procedures to be employed:

- *For the exposed person:*
  - ✓ Anyone injured by a sharp should see a doctor if there is any possibility of contamination with someone else's blood or other body fluid. Usually, the doctor will:
    - assess the likely exposure based on what has happened;
    - record any current medications, underlying medical conditions and circumstances;
    - test for HIV, HBV and HCV (baseline testing) and assess the tetanus risk;
    - ascertain whether the person affected has been immunised against HBV and/or tetanus, and if so when;
- for the person who was the source of the blood or other body fluid (if known);
- to assess the infection risk, and
- to record the incident and follow-up actions to make similar incidents less likely.

The plan should be clear as to who will do what, and should make sure that anyone who will counsel the exposed person has relevant knowledge and experience. Counselling, treatment (to prevent or treat disease) and follow-up as appropriate should be offered.

All needle-stick, sharps and biological exposure incidents should be reported using the [Accident and Incident Report Form](#). In every case, the injury, immediate response and follow-up should all be properly documented.

#### 6.6.5 First Aid

Heads of School, supervising academic staff, laboratory staff and designated campus First Aid Officers should be familiar with their responsibilities for providing first aid services and facilities (e.g. First aid kits) as outlined in the [ACU First Aid Procedures](#). Each ACU campus has appointed designated First Aid Officers (FAO) who are on call. However, Heads of School are encouraged to make known to their staff and students those laboratory or academic staff, other than designated FAO, who may hold appropriate Advanced First Aid qualifications.

Injuries of any type should be reported immediately to the academic or laboratory staff member for assessment and, if required, treatment. An [Accident and Incident Report Form](#) should be completed and submitted to the local Campus Operations unit as soon as possible.

Should a serious incident occur e.g. an explosion which destroys the laboratory, all staff and students involved should attend a debriefing session. If students require post-incident counselling, they should be referred in the first instance to the University Counselling Service. Staff are able to seek appropriate counselling services through the University's Employment Assistance Provider, [ACCESS Programs Australia \(1800 81 87 28\)](http://ACCESS Programs Australia (1800 81 87 28)).

## 6.7 Safety Equipment

Safety equipment requirements should be identified for each laboratory through risk assessment and, as such, all laboratories are required to have safety equipment installed and/or available to manage the identified residual risks. Risk assessments should be used to identify the type of safety equipment required for the laboratory, e.g. safety showers are unlikely to be required for a computer laboratory.

Safety equipment generally falls into three key categories as summarised below:

1. **Fixed** may include but is not limited to safety showers with or without eye wash facilities, eye wash stations, emergency isolation valves and switches, bench mounted fume extraction systems, fume cupboards, drainage pits and approved storage cabinets.
2. **Portable** may include fire extinguishers ([Appendix 2](#) provides information in relation to extinguisher types), fire blankets, first aid kits, sharps and broken glass disposal bins, spill kits, trolleys and protective shields.
3. **Personal Protective Equipment (PPE)** can include items such as coats, eye protection (safety glasses, goggles), respiratory protection (masks, respirators), hearing protection and shoes.

Please refer to [Appendix 1](#) for a list of references as they relate to the requirements concerning laboratory safety equipment.

## 6.8 Risk Management and Assessment

ACU campuses are all covered by [State/Territory OHS legislation](#) and its subordinate regulations and codes of practice. An inherent part of Australian OHS legislation is the requirement for workplaces to undertake risk assessments on all of their activities which may impact the health and safety of staff, students, visitors and contractors.

As such, laboratories may be deemed to be relatively high risk areas due to the hazardous activities undertaken therein when compared to other work areas within the University. Schools should develop and implement a laboratory risk assessment protocol based upon the *ACU Occupational Health and Safety Risk Management Program Guidelines*. The guidelines will assist laboratory risk assessment teams to follow the standard risk assessment process of **Identification, Assessment and Control** for all of the major hazard groups that are likely to be present in ACU laboratories.

The major hazard groups most likely to be identified include:

- Manual Handling Hazards
- Equipment and Process Hazards
- Chemical Exposure Hazards
- Biological Exposure Hazards

By reviewing the various laboratory work areas and activities against each of the major hazard groups, a comprehensive assessment will be produced that incorporates all of the OHS legislative requirements and University standards.

The risk assessment forms provided at [Appendices 6, 7, 8 and 9](#) have been designed to allow assessment teams to quickly and comprehensively identify and assess the hazards in the laboratory, rank them in terms of priority and provide guidance for the development of appropriate control measures.

Laboratory inspections are an important part of the risk management process, serving to both identify hazards and to review the adequacy of risk control measures. The inspections undertaken may vary in formality but generally would take the form of:

- **Walk-throughs** – walking around to check for things which may be out of the ordinary; these would most likely be completed by laboratory staff on a daily basis;
- **Safety inspections** – may be performed by the local OHS Committee and/or laboratory/academic staff using a checklist similar in nature to [Appendix 6](#); and
- **Safety audits** – these are more formal and may focus on the risk management systems. [Appendix 7](#) may be of use during such an audit.

In relation to risk, time and expertise should be invested on selecting an appropriate control measure and instigating it. Supervising academics and laboratory managers are responsible for following through and ensuring the controls are put in place by the work area or support services as appropriate. Risk assessments should relate to any work or learning activity that is to be undertaken in a laboratory or associated facility. Please refer to [Appendices 8 and 9](#)

The assessment and management of risk is an ongoing process and must be continually evaluated to reflect changes in the quantity or type of hazardous substances present in the laboratory, types of procedures to be performed, and current regulations and recommendations from statutory OHS authorities regarding safe laboratory practices.

## 6.9 Laboratory Safety Inductions

ACU academic and laboratory technical staff, students, support services staff, contractors and visitors entering laboratories or laboratory support rooms are required to receive safety induction training commensurate with their level of participation in laboratory activities and the duties they are to perform. The safety inductions should be completed prior to the commencement of laboratory work. Schools are encouraged to develop on-line induction packages utilising programs such as Blackboard or, alternatively, may choose to conduct the inductions face-to-face.

Induction involves learning about safety procedures and being prepared for emergencies. The recommended levels of induction training appropriate to all staff and students, visitors and contractors are outlined below:

- **Undergraduate Students** – must complete laboratory safety inductions prior to commencing laboratory practicum and therefore, the induction should be specific to each laboratory and also include site specific emergency information. The induction should be conducted by an academic responsible for the teaching the laboratory practicum in conjunction with laboratory technical staff.
- **Staff and Postgraduate Students** – New staff and postgraduate students should complete appropriate site-specific laboratory safety induction training prior to commencing their work or research. The induction should be conducted by the supervisor or research supervisor in conjunction with laboratory technical staff.
- **Casual Staff** – The requirements for safety induction training are as detailed above for other staff.
- **Contractors** – All contractors who are required to work within a laboratory facility should undergo laboratory-specific safety induction, prior to the contractor commencing any work. Laboratory managers, in consultation with relevant stakeholders, should determine the nature, timing and content of the induction. Laboratory staff would need to be informed by Campus Operations as to when any work was scheduled and would need to have a time organised to meet with the contractor. Any contractors organised directly by laboratory staff directly are generally briefed already.

- **Visitors** – Should be provided with an appropriate laboratory-specific safety brief and, for their own safety, must be supervised at all times during their visit.

Schools are responsible for:

- developing the safety induction course(s) (on-line or face-to-face) for each laboratory type for which they are respectable;
- appointing the person(s) responsible for conducting the safety induction training, and
- maintaining records of person(s) who have completed the training (please refer to [Appendix 5](#) for a suggested induction checklist containing a declaration and sign-off section that may be used for record keeping purposes).

## 6.10 General Laboratory Safety

Given that a laboratory is a potentially hazardous place to work, strict adherence to laboratory safety rules and regulations can greatly reduce the risk associated with potential hazards. Person(s) who act contrary to established laboratory rules may be asked to leave and/or denied access to the laboratory.

Individual Schools should develop and implement local laboratory safety instructions that are designed to meet their specific needs but remain compatible with these guidelines, Australian standards and OHS legislation and regulations. For instance, individual Schools may need to develop laboratory specific rules and regulations covering:

- access to laboratories and associated facilities;
- conduct of staff/students;
- use of safety equipment;
- requirements for the wearing and use of personal protective equipment;
- personal hygiene;
- After-hours work;
- Working alone or in isolation which should only be undertaken when adequate risk control measures are implemented taking into consideration:
  - the individual's experience and training,
  - nature and degree of hazard(s) associated with the work;
  - availability and effectiveness of control measures;
  - criticality of work to be undertaken; and
  - the likely harm that may result if an accident occurs.
- unattended or overnight work in progress; and
- housekeeping checklists.

### 6.10.1 General Equipment

All general equipment falls within the definition of plant and equipment and as such is subject to ACU policies on purchasing, installation, training, maintenance and risk assessment. Schools are urged to contact their local Campus Operations unit for further information.

Furthermore, there are certain types of equipment that are specific to laboratory environments and, as such, should be operated and managed as outlined below.

### 6.10.2 Fume Cupboards

Fume cupboards are a safety device used within a laboratory to ensure that persons are not exposed to toxic fumes during experimentation and/or other related work such as decanting. They should be used for all operations that have the potential to generate fumes, mists or dusts of a hazardous nature. Fume cupboards should not be used for work involving microorganisms, specimens of human and animal origin, and recombinant DNA. Biological safety cabinets should be used for such work.

Fume cupboards are classified as hazardous areas (refer to AS 2430.3.6:2004). [AS/NZS 2243.8:2006 Safety In Laboratories - Fume Cupboards](#) provides guidance on:

- design and location;
- procurement;
- maintenance and testing of fume cupboards;
- the effective operation of fume cupboards;
- work involving the use of perchloric and hydrofluoric acids; and
- risks assessments relating to the volume of liquids and flammable liquids when using fume cupboards.

### 6.10.3 Autoclaves

Autoclaves, by their very nature, present a considerable hazard. The hazard is mostly from heat and hot liquid under pressure; subsidiary risks are manual handling. The instruction manual must be followed and all users must be trained and a record of their training must be kept by the Head of School/laboratory manager responsible for the laboratory.

When using autoclaves the minimum safety precautions are:

- When loading an autoclave that is already hot, gloves and a lab coats;
- Prior to unloading the autoclave, making sure that the:
  - autoclave cycle is finished
  - temperature is below 100°C, and
  - pressure is 0.
- When unloading the autoclave, gloves, lab coat and face/eye protection.

Autoclaves should be operated and maintained in accordance with:

- *AS.NZS 2182:1998 Sterilizers – Steam – Bench Top*
- *AS.NZS 2192:1991 Sterilizers – Steam – Downward Displacement*
- *AS.NZS 2243.3.:2002 Safety in Laboratories Part 3: Microbiological Aspects and Containment Facilities*
- *Operators manuals and maintenance schedules*

### 6.10.4 Bio-Safety Cabinets

*AS/NZ 2647 "Biological Safety Cabinets - Installation and Use"* provides guidance on the use, decontamination and testing of bio-safety cabinets. Any procedure which is likely to produce infectious aerosols, such as blenders, shakers and sonicators involving highly infectious organisms, must be handled in a bio-safety (HEPA) cabinet in which highly contaminated air is passed through a High Efficiency Particulate Air filter.

There are three classes of biological safety cabinet.

- **Class I** - inward flow of air away from the operator. The air is passed through a HEPA filter before being discharged from the cabinet;
- **Class II** - an air barrier protects the operator and a flow of filtered air is passed over the work to prevent it becoming contaminated. The air is passed through a HEPA filter before being discharged from the cabinet;
- **Class III** - completely enclosed unit with built-in air locks for introducing and removing materials. Both incoming and outgoing air passes through HEPA filters.

Class I and Class II cabinets are completely free standing and must not be directly connected to ducting which has outside vents as wind may interfere with operator protection.

Class III cabinets are intended for use with highly hazardous micro-organisms.

### 6.10.5 Refrigeration

Refrigeration is commonly used in laboratories and a number of safety precautions should be implemented as necessary:

- 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.
- Domestic refrigerators in laboratories must have signage indicating no food, drink and/or flammable material are to be stored and whether hazardous substances are being stored.
- Flammable liquids requiring refrigeration should be stored in refrigerators that have spark-proof wiring.
- Cold rooms must have door fittings that enable the doors to be opened from the inside. An emergency light or luminous sign indicating the position of the door should be fitted to the inside of the cold room.

### 6.10.6 Electrical Equipment

Electricity has a great potential to injure or kill people. In order to reduce the likelihood of incidents, laboratories should develop and implement processes which include:

- Close liaison with their local Campus Operations unit with respect to the purchase, installation, testing and maintenance of electrical equipment;
- Consulting State and Territory OHS and electrical safety legislation, regulations, codes of practice and Australian standards including *AS 2243.7:1991 Safety in Laboratories – Electrical Aspects* and *AS/NZS 3670:2003 In-service safety inspection and testing of electrical equipment*;
- Ensuring that plugs and cords are in good condition;
- Ensuring that equipment is repaired or replaced if unsafe;
- Not using equipment in a condition likely to give rise to electrical hazards;
- Ensuring that laboratory personnel are aware of the "Tag Out" system for unsafe equipment;
- Not locating electrical equipment near water outlets;
- No double using adapters or piggy-back plugs;
- Not storing flammables in refrigerators and freezers;
- Labeling equipment left on overnight;
- Ensuring procedures for minimising power usage are known and practiced;
- Testing and tagging electrical equipment in accordance with State and Territory legislation and AS/NZS 3670:2003; and
- Establishing records of inspection, testing and maintenance for electrical equipment and having these maintained by Schools in charge of laboratories in conjunction with their local Campus Operations unit

### 6.10.7 Glassware

Broken glassware has the potential to cause a number of injuries. As such, it is highly recommended that the following precautions are taken:

- All glassware is securely stored so as to minimise the risk of breakage.
- All glass tubing should have the ends flame-polished.
- Broken or chipped glassware is not used.
- 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.

### 6.10.8 Gas Cylinders

ACU uses a range of products that are delivered in gas cylinders. Gas cylinders are designed and constructed to Australian standards and can provide many years of safe and reliable service. Gas cylinders, however can be a significant hazard if mistreated or misused. All persons working with gas cylinders should familiarize themselves with *AS 4332-2004/Amdt 1-2005 – The Storage and Handling of Gases in Cylinders*.

ACU is legally obliged to ensure that any facility used for storing gas cylinders or for venting off cylinder contents is specifically designed, approved, located and built to legislative requirements as detailed in AS 4332 and State/Territory legislation. Such storage facilities must also be placarded/signed correctly, secured and maintained to ensure that the substance can be used in a manner that minimises the risk of accident or injury.

Laboratories should observe the following general precautions for the storage and handling of gas cylinders:

- Gas cylinders are to be kept away from artificial sources of heat, i.e. radiators, boilers or steam pipes, and unobstructed ;
- Gas cylinders are to be provided with adequate ventilation at all times;
- Classes of gas cylinders are to be segregated within the store, but need not be separated by physical barriers;
- Outdoor storage of Class 2 cylinders are to be separated from other dangerous goods by 3 metres;
- gas cylinders are not to be stored less than 1 m from any door, window, air vent or duct;
- all gas cylinders are to be secured in the upright position by chain or other means to prevent falling.
- Gas cylinders are moved by properly trained personnel using an appropriate trolley.

### 6.11 Chemical Safety

ACU has certain legal and regulatory obligations under State/Territory OHS and dangerous goods legislation and Australian standards relating to chemical management and in particular, the management of hazardous substances and dangerous goods in the workplace. Please refer to [Appendix 1](#) for a list of references as it applies to chemicals, dangerous goods and hazardous substances.

The legal obligations include the need for persons in control of the workplace, and, for the purposes of these guidelines, those staff responsible for laboratories, workshops and studios to produce and make available up-to-date (a schedule for checking currency of registers, MSDS, etc needs to be developed and resourced) information to all persons the following information:

- **A register of hazardous substances and dangerous goods** used in the laboratory, workshop or studio – see [Appendix 1](#) for references;
- **Material Safety Data Sheets (MSDS)** for each hazardous substance and dangerous good used which is a MANDATORY requirement. The MSDS provides critical information required for the safe handling of chemicals including chemical and physical properties, health hazard information, safe storage, use, handling and disposal procedures and procedures for an emergency. The [National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition \[NOHSC:2011 \(2003\)\]](#) refers;
- **Risk assessments reports** (refer to [Appendix 9](#)) for each hazardous substance and dangerous good detailing appropriate risk control measures. Any risk assessment reports

for dangerous goods in a designated work area must be readily accessible to all persons storing and handling the dangerous goods. See [Appendix 1](#) for a list of references in relation to dangerous goods;

- **Appropriate labels on containers** – all containers used for storage of chemicals and reagents must be labelled in accordance with [National Code of Practice for the Labelling of Workplace Substances \[NOHSC:2012 \(1994\)\]](#);
- **Appropriate emergency procedures** including procedures for cleaning up spills;
- **Appropriate induction and training** for all staff/students who work with chemicals, dangerous goods and hazardous materials;
- **Training records** for staff and students;
- **Dangerous Goods** – information covering classification ([Appendix 3](#) refers), packing groups and their use with plant and equipment;
- **Hazardous Substances** – criteria for identifying hazardous substances as per *the NOHSC Hazardous Substances Information System (HSIS)*, risk assessments, identifying if health surveillance is required, and prohibited use provisions for substances including:
  - Arsenic or its compounds
  - Asbestos
  - Benzene
  - Carbon disulphide
  - Crystalline silicone dioxide
  - Methanol
  - Tetrachloroethane
  - Tetrachloromethane (carbon tetrachloride)
- **Carcinogenic substances** – identification of carcinogens (*Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008 (2004)]* refers), the identification of scheduled carcinogens (*National Model Regulations for the Control of Scheduled Carcinogenic Substances [NOHSC: 1011 (1995)]* and the *National Code of Practice of Schedules Carcinogenic Substances [NOHSC: 2014 (1995)]* refer.), risk assessments involving the use of carcinogens, the storage and labelling of carcinogens, and their monitoring and disposal.
- **Poisons and Drugs** – information relating to toxicity, danger to life, potential for abuse, safety as per State/Territory poisons and therapeutic drugs legislation and regulations.

## 6.12 Biological Safety

The University recognises that staff, students, contractors and visitors working and studying at ACU may handle or be exposed to biological materials, including human blood and body fluids that put them at risk of contracting infection from HIV, the hepatitis viruses or other blood-borne pathogens. In addition, in the clinical setting, patients, students and supervising staff may be exposed to other potentially infectious materials.

All ACU laboratories which handle biological materials are expected to develop, implement and monitor procedures and guidelines for biological safety. The bio-safety procedures and guidelines will be overseen and reviewed by the Laboratory and Bio-safety Focus Group. Procedures should be developed, documented and implemented for:

- **Risk Assessments** – Heads of School are to ensure that risk assessments are carried out, health surveillance records are maintained where necessary, and if considered necessary, a School Bio-safety Officer appointed;
- **Induction of students and staff;**
- **Hazard and Accident/Incident Reporting** – reporting accidents/incidents and hazards to laboratory staff and completion of the [Accident and Incident Report Form](#);
- **First Aid** – in particular, procedures should be developed for handling a possible exposure to a communicable disease and/or exposure to blood and body fluids;
- **Handling and disposal of sharps and needles;**
- **Emergency Response** – ensuring that all laboratories have emergency equipment and procedures, and also have procedures **for handling biological and/or chemical spills.**

- **Personal Protective Equipment (PPE)** – ensuring that:
  - laboratory coats are worn at all times and are laundered on a regular basis,
  - covered shoes are worn at all times,
  - protective safety glasses and eye shields are provided, and
  - Latex or nitrile gloves are available and used.
- **Safe work practices/safe handling instructions are developed for:**
  - fume cupboards, biological safety cabinets and autoclaves (refer to [Sections 6.10.2, 6.10.3](#) and [6.10.4](#)),
  - liquid nitrogen and laser equipment,
  - refrigerators, electrical equipment and plant and equipment,
  - spills,
  - waste disposal, e.g. biological, chemical, broken glass, sharps waste
  - hazards, e.g. animals and biological (bacterial and animal cell) cultures,
  - infection control, particularly where blood and body fluids are handled,
  - manual handling.
- **Immunisation** – The University strongly recommends that staff and students are immunised as a protective measure where there is a risk of exposure to infectious diseases such as hepatitis.

### 6.13 Disposal of Laboratory Waste

Heads of School, supervising academic staff and laboratory managers should in consultation with their local Campus Operations unit develop procedures for the disposal of waste generated by laboratories under their control. The procedures should protect the health and safety of persons in control of, or exposed to hazardous waste in the workplace, and community in general. The appropriate controls adopted should be environmentally responsible and comply with State/Territory OHS and environmental protection legislation and regulations as well as the AS/NZS 2243 and AS 4031 series.

Depending on the laboratory's use, procedures should be in place for:

- segregation of all waste (AS/ZNS 2243.1, AS/NZS 2243.3, AS/NZS 2243.4 refer);
- segregation, storage and disposal of chemical and solvent waste;
- segregation, storage and disposal of clinical and biological waste (please note that all clinical and biological waste should be classified as contaminated);
- segregation, storage and disposal of mixed waste;
- storage and disposal of broken glass and sharps; and
- training of staff and students in waste management and spills clean-up procedures.

All staff, researchers and students must maintain a high standard of housekeeping and follow all local waste disposal processes.

## 7 Policy Review

The University may make changes to these guidelines from time to time. In this regard, any staff member who wishes to make any comments about these guidelines may forward their suggestions to the Director, Human Resources.

## 8 Further Assistance

Any staff member or student who requires assistance in understanding the University's Laboratory Safety Guidelines should first consult their nominated supervisor. Should further

policy advice be needed, staff members should contact the Human Resources Consultant responsible for their campus.

## **9 Attachments**

[Appendix 1 - References and Publications – Laboratory Safety](#)

[Appendix 2 - Types of Fire Extinguishers](#)

[Appendix 3 - Classification of Dangerous Goods](#)

[Appendix 4 – Suggested Medical Disclosure Form](#)

[Appendix 5 - Laboratory Safety Induction Checklist](#)

[Appendix 6 - Laboratory Safety Assessment Form](#)

[Appendix 7- Laboratory Risk Assessment Checklist/Form](#)

[Appendix 8 – Risk Assessment Tool for Practical Activities/Experiments](#)

[Appendix 9 – Chemical Risk Assessment Worksheet](#)

## Appendix 1 - References and Publications (Laboratory Safety)

Further advice and information to supplement these guidelines can be found in the following documentation.

### Legislation

The list below is not exhaustive, and it is highly recommended that you visit the relevant State/Territory WorkCover website.

Jurisdiction	Legislation/Regulation/Codes of Practice
<b>Australian Safety and Compensation Commission</b>	<ul style="list-style-type: none"> <li>• <a href="#">National Standard for the Storage and Handling of Workplace Dangerous Goods [NOHSC:1015(2001)]</a></li> <li>• <a href="#">National Code of Practice for the Storage and Handling of Dangerous Goods [NOHSC:2017(2001)]</a></li> <li>• <a href="#">National Model Regulation for the Control of Workplace Hazardous Substances</a></li> <li>• <a href="#">National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC:2007(1994)]</a></li> <li>• <a href="#">Guidance Note for the Assessment of Health Risks Arising from Hazardous Substances in the Workplace [NOHSC:3017(1994)]</a></li> <li>• <a href="#">Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)]</a></li> <li>• <a href="#">National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC:2011(2003)]</a></li> <li>• <a href="#">National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012 (1994)]</a></li> </ul>
<b>Commonwealth Government</b>	<ul style="list-style-type: none"> <li>• <a href="#">Road Transport Reform (Dangerous Goods) Act 1995 (Commonwealth)</a></li> <li>• <a href="#">Road Transport Reform (Dangerous Goods) Regulations 1997 (Commonwealth)</a></li> </ul>
<b>Australian Capital Territory</b>	<ul style="list-style-type: none"> <li>• <a href="#">Occupational Health and Safety Act 1989</a></li> <li>• <a href="#">Dangerous Substances Act 2004</a></li> <li>• <a href="#">Dangerous Substances (Explosives) Regulation 2004</a></li> <li>• <a href="#">Dangerous Substances (General) Regulation 2004</a></li> </ul>
<b>New South Wales</b>	<ul style="list-style-type: none"> <li>• <a href="#">Occupational Health and Safety Act 2000 No 40</a></li> <li>• <a href="#">Occupational Health and Safety Regulation 2001</a></li> <li>• <a href="#">Occupational Health and Safety Amendment (Dangerous Goods) Act 2003 No 38</a></li> <li>• <a href="#">Occupational Health and Safety Act 2000 - Occupational Health and Safety Amendment (Dangerous Goods) Regulation 2005 (2005-531)</a></li> <li>• <a href="#">Control of Workplace Hazardous Substances.</a></li> <li>• <a href="#">Preparation of Material Safety Data Sheets: Code of Practice (based on NOHSC:2011 (2003)).</a></li> </ul>
<b>Queensland</b>	<ul style="list-style-type: none"> <li>• <a href="#">Workplace Health and Safety Act 1995</a></li> <li>• <a href="#">Workplace Health and Safety Regulation 2008</a></li> <li>• <a href="#">Hazardous Substances Code of Practice 2003</a></li> </ul>
<b>Victoria</b>	<ul style="list-style-type: none"> <li>• <a href="#">Occupational Health and Safety Act 2004 Dangerous Goods Act 1985</a></li> <li>• <a href="#">Occupational Health and Safety Regulations 2007</a></li> <li>• <a href="#">Road Transport (Dangerous Goods) Act 1995</a></li> <li>• <a href="#">Dangerous Goods (Storage and Handling) Regulations 2000</a></li> </ul>

## Australian Standard 2243 – Safety in Laboratories

This standard comprises ten separate parts part dealing with different aspects of Laboratory safety (see list below).

<b><u>AS/NZS 2243.1:2005</u></b>	Safety in Laboratories—Planning and operational aspects
<b><u>AS/NZS 2243.2:2006</u></b>	Safety in Laboratories—Chemical aspects
<b><u>AS/NZS 2243.3:2002</u></b>	Safety in Laboratories—Microbiological aspects and containment facilities
<b><u>AS 2243.4—1998</u></b>	Safety in Laboratories—Ionizing radiations
<b><u>AS/NZS 2243.5:2004</u></b>	Safety in Laboratories—Non-ionizing radiations - Electromagnetic, sound and ultrasound
<b><u>AS 2243.6—1990</u></b>	Safety in Laboratories—Mechanical aspects
<b><u>AS 2243.7—1991</u></b>	Safety in Laboratories—Electrical aspects
<b><u>AS/NZS 2243.8:2006</u></b>	Safety in Laboratories—Fume cupboards
<b><u>AS/NZS 2243.9:2003</u></b>	Safety in Laboratories—Recirculating fume cabinets
<b><u>AS/NZS 2243.10:2004</u></b>	Safety in Laboratories—Storage of chemicals

### Other Relevant Australian Standards

A number of other Australian Standards have further information on Laboratory safety – some of which are listed below.

<b>AS 1319</b>	Safety Signs for the Occupational Environment
<b>AS/NZS 2647</b>	Biological Safety Cabinets – Installation and Use
<b>AS/NZS 2211.1</b>	Laser Safety Part 1: Equipment Classifications, Requirements AND User's Guide
<b>AS/NZS 3838</b>	The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers
<b>AS 3780</b>	The Storage and Handling of Corrosive Substances
<b>AS/NZS 3670:2003</b>	In-service safety inspection and testing of electrical equipment
<b>AS 1940</b>	The Storage and Handling of Flammable and Combustible Liquids
<b>AS 4326</b>	The Storage and Handling of Oxidizing Agents
<b>AS 2714</b>	The storage and handling of hazardous chemical materials - Class 5.2 substances (organic peroxides)
<b>AS 4332</b>	The Storage and Handling of Gases in Cylinders
<b>AS 4267</b>	Pressure Regulators for use with Industrial Gas Cylinders
<b>AS 4452</b>	The Storage and Handling of Toxic Substances

### Biological Hazards

- [AQIS](#)
- [AQIS checklist for importing biological materials](#)
- [AQIS guide to importing biological products](#)
- [AQIS in vivo approval for use of imported biologicals](#)
- [AQIS Quarantine Approved Premises](#)
- [AS/NZS 2243.3:\(2002\) – Safety in Laboratories – Microbiological Aspects and containment facilities](#)
- [Gene Technology Act 2000](#)

- [Gene Technology Regulations 2001](#)
- [Handbook on the Regulation of Gene Technology in Australia](#)
- [ICON \(AQIS Import Conditions Database\)](#)
- [National Code of Practice for the Control of Work-related Exposure to Hepatitis and HIV \(Blood-borne\) Viruses \[NOHSC:2010\(2003\)\]](#)
- [OGTR guidelines](#)
- 'Infection Control in the Health Care Setting' by ANCA (Australia National Council on Aids)
- NHMRC (National Health and Medical Research Council), ANCA Bulletin No. 16: Needlestick and blood accidents.
- State and Commonwealth Departments of Health

### Safety Equipment

- [AS/NZS 2982.1:\(1997\) - Laboratory design and construction – General Requirements](#)
- [ANSI Z358.1: Emergency eyewash and shower equipment \(American Standard\)](#)
- [AS/NZS 2243.1:2005 - Safety in laboratories – Planning and operational aspects](#)
- [AS/NZS 1336: 1997 - Recommended practices for occupational eye protection](#)
- [AS/NZS 1337:1992 - Eye protectors for industrial applications](#)
- [AS/NZS 1715:1994 - Selection, use and maintenance of respiratory protection devices](#)
- [AS/NZS 1716:2003 - Respiratory protective devices](#)
- [AS/NZS 2161:1-10 - Occupationally protective gloves \(parts 1-10\)](#)
- [AS/NZS 1270:2002 - Acoustics – Hearing protectors](#)
- [AS/NZS 2210:1&2:1994&2000 - Occupational Protective Footwear](#)

### CCH Laboratory Safety Manual, CCH Australia Ltd

This text provides clear safety advice and interprets relevant sections from the Australian Standards and legislation.

**Material Safety Data Sheets (MSDS)** *The National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]* states that manufacturers and importers are responsible for the preparation and provision of MSDS. Suppliers of hazardous substances are responsible for provision of the MSDS which the manufacturer or importer has prepared. Suppliers are not required to provide a MSDS on the first supply to retailers and retail warehouse operators for consumer packages which hold less than 30 kilograms or 30 litres and which are not intended to be opened on their premises.

A retailer or retail warehouse operator does not need to supply MSDS to purchasers of hazardous substances where those substances are contained in consumer packages holding less than 30 kilograms or 30 litres, intended for retail sale and which will not be opened on the retailer's or operator's premises.

MSDS are used internationally to provide the information required to allow the safe handling of substances at work. Website links include:

- <http://msdssolutions.com/>
- <http://www.msdonline.com/>
- [Chemical manufacturers and suppliers](#)
- [Pesticides \(herbicides, insecticides etc.\)](#)

## Appendix 2 – Types of Fire Extinguishers

Before using a fire extinguisher read the instructions ensuring that it is appropriate to the type of fire. The four types of fire extinguishers most likely located in or near Campus Laboratories are:

- Carbon Dioxide Extinguisher;
- Foam Extinguisher;
- Water Extinguisher, and
- Wet-Chemical Extinguisher.

Please refer to the table below extracted from AS2444-2001 and Chubb.

		Class of Fire					NOTES
		A	B	C	E	F	
		Wood, paper and plastics	Flammable and combustible liquids	Flammable gases	Energised electrical equipment	Cooking oils and fats	<b>LIMITED</b> indicates that the extinguishant is the agent of choice for the class of fire, but that it will have limited extinguishing capability.
							<b>Class D</b> fires (involving combustible metals) use only special purpose extinguishers and seek expert advice.
		YES					<b>COMMENTS</b> Refer to Appendix A of AS 2444
		NO					
Colour scheme - AS2444							
Pre 1999 Post 1999							
Type of Fire Extinguisher	Water	✓	✗	✗	✗	✗	Dangerous if used on flammable liquid, live electrical equipment and cooking oil/fat fires.
	Wet Chemical	✓	✗	✗	✗	✓	Dangerous if used on electrical fires.
	Foam	✓	✓	✗	✗	LIMITED ✓	Dangerous if used on electrical fires.
	Powder AB(E)	✓	✓	✓	✓	✗	Special powders are available specifically for various types of metal fires (seek expert advice).
	Powder B(E)	✗	✓	✓	✓	✓	Special powders are available specifically for various types of metal fires (seek expert advice).
	Carbon Dioxide	LIMITED ✓	LIMITED ✓	✗	✓	✗	Generally not suitable for outdoor use. Suitable only for small fires.
	Vaporising Liquid	✓	LIMITED ✓	LIMITED ✓	✓	✗	Check the characteristics of the specific extinguishant.
FIRE HOSE REEL		<b>'A' TYPE FIRES ONLY</b> Paper, wood and plastics.					<b>NOTE:</b> Ensure you maintain a path of egress between you and the nearest exit.
FIRE BLANKET		<b>'F' TYPE FIRES ONLY</b> Cooking Oils and Fats					<b>NOTE:</b> Use as a blanket to wrap around a human torch (ensure you replace after every use).

Extract - AS.2444-2001

## Appendix 3 – Classification of Dangerous Goods

Dangerous goods are usually chemicals which have the potential to present an immediate threat to people, property or the environment if not properly contained or controlled. They are classified according to the nature of the hazard into nine classes, some of which are divided into sub-classes. These classes are denoted by specific labels (or diamonds) which are illustrated below. For further information consult the *Australian Dangerous Goods Code* (6<sup>th</sup> Edition).

### Class 1 - EXPLOSIVES



Explosive substances and articles used to produce explosions or pyrotechnic effect. This class is sub-divided into

- Class 1.1 (TNT, ANFO);
- Class 1.2 (bombs, grenades);
- Class 1.3 (display fireworks);
- Class 1.4 (toy fireworks);
- Class 1.5 (proprietary explosives)

### Class 2 - GASES



Gases which are compressed, liquefied or dissolved under pressure. This class is sub-divided into:

- Class 2.1 Flammable gases (acetylene, hydrogen, LPG);
- Class 2.2 Non-Flammable Non-Toxic gases (nitrogen, carbon dioxide, liquid oxygen, medical air);
- Class 2.3 Toxic gases (ammonia, chlorine)

### Class 3 - FLAMMABLE LIQUIDS



Liquids which ignite on contact with ignition sources. This class is sub-divided by:

- Packaging Group I (greatest danger - ether);
- PG II (medium danger - petrol, alcohol, acetone, thinners);
- PG III (minor danger - kerosene, turpentine)

### Class 4 - FLAMMABLE SOLIDS



Gases which are combustible or emit a flammable gas when wet. This class is sub-divided into:

- Class 4.1 Flammable solids (nitrocellulose, magnesium, sulphur, activated charcoal, phosphorus, matches);
- Class 4.2 Spontaneously Combustible (sodium sulphide);
- Class 4.3 Dangerous When Wet (calcium carbide, zinc, alkali metals)

### Class 5 - OXIDISING AGENTS and ORGANIC PEROXIDES



This class is sub-divided into:

- Class 5.1 Oxidising agents (pool chlorine, hydrogen peroxide, ammonium nitrate);
- Class 5.2 Organic peroxides (benzoyl peroxides, cumene hydroperoxide)

### Class 6 - TOXIC SUBSTANCES



This class is sub-divided into:

- Packaging Group I (sodium cyanide, lead compounds);
- PG II (aniline, arsenic, phenol, some pesticides);
- PG III (lead acetate, trichloroethylene, some pesticides)

### Class 7 - RADIOACTIVE SUBSTANCES



Radioactive substances comprise substances or a combination of substances which emit radiation. Examples are uranium and radioisotopes.

### Class 8 - CORROSIVE SUBSTANCES



This class is sub-divided into:

- Packaging Group I (hydroflouric acid, nitric acid);
- PG II (hydrochloric acid, caustic soda);
- PG III (phosphoric acid, liquid chlorine)

### Class 9 - MISCELLANEOUS DANGEROUS GOODS



Substances which present relatively low hazards. Examples are aerosols, polyester beads.

### A Typical Emergency Information Panel

<b>ANHYDROUS AMMONIA</b> UN No. <b>1005</b> HAZCHEM <b>2RE</b> IN EMERGENCY DIAL <b>000 POLICE or FIRE BRIGADE</b>		 	<b>Interpretation of 2RE</b>  Water fog is the suggested agent. There is no risk of violent reaction. Full protection required. Dilute. Consider evacuation. (Also, check HB76 for each material.) See HAZCHEM Codes next page.
		SPECIALIST ADVICE ORGANISATION NAME AND PHONE NUMBER	

### The HAZCHEM Code

<table border="1"> <tr> <td>1 WATER JETS</td> <td rowspan="2">In the absence of fog, a fine spray may be used.</td> </tr> <tr> <td>2 WATER FOG</td> </tr> <tr> <td>3 FOAM</td> <td rowspan="2">Water must be allowed to come in contact with the material.</td> </tr> <tr> <td>4 DRY AGENT</td> </tr> </table>	1 WATER JETS	In the absence of fog, a fine spray may be used.	2 WATER FOG	3 FOAM	Water must be allowed to come in contact with the material.	4 DRY AGENT	It is an <b>initial</b> emergency response code, with up to three symbols, e.g. 2 R E, which indicate the fire fighting and dispersion agents ( <b>1,2,3 and 4</b> ) the risks, personal protection and other measures ( <b>P,R,S,T,W,X,Y and Z</b> ), and whether or not to consider evacuation ( <b>E</b> ).
1 WATER JETS	In the absence of fog, a fine spray may be used.						
2 WATER FOG							
3 FOAM	Water must be allowed to come in contact with the material.						
4 DRY AGENT							
	<b>Other terms:</b>  <b>V</b> - risk of violent reaction or explosion. <b>FULL</b> - minimum of a chemical splash suit, breathing apparatus and impervious gloves						

<b>P</b>	V	FULL	<b>DILUTE</b>
<b>R</b>			
<b>S</b>	V	BA	
<b>S</b>		BA for FIRE only	
<b>T</b>		BA	<b>CONTAIN</b>
<b>T</b>	V	BA for FIRE only	
<b>W</b>	V	FULL	
<b>X</b>			
<b>Y</b>	V	BA	
<b>Y</b>		BA for FIRE only	
<b>Z</b>		BA	
<b>Z</b>	V	BA for FIRE only	
<b>E</b>	CONSIDER EVACUATION		

and boots. In some cases, a fully sealed gas suit will be required (see Dangerous Goods - Initial Response Guide - HB76).

**BA** - breathing apparatus and impervious gloves.

**DILUTE** - may be washed away with large quantities of water, and, wherever practicable, should be contained and prevented from entering drains and watercourses.

**CONTAIN** - prevent any spillage from entering drains and watercourses.

## Appendix 4 – Suggested Medical Disclosure Form

<b>MEDICAL DISCLOSURE FORM – LABORATORY/WORKSHOP ACTIVITIES</b>			
<ol style="list-style-type: none"> <li>1. In order to assist the University assess the capacity for all staff (including employees and contractors), students and any other persons who participate in activities in ACU laboratories or workshops to do so safely, you are required to complete this Form.</li> <li>2. If, after completing this Form, you become aware of any change in circumstances which may affect your capacity to participate safely in any laboratory or workshop activities, you should immediately advise your Laboratory Supervisor/Course Coordinator and, as soon as practicable, complete a further copy of this Form.</li> <li>3. If you have any doubts about your capacity to participate safely in laboratory or workshop activities, you should speak with your laboratory supervisor/course coordinator and you may also wish to obtain medical advice.</li> <li>4. If you have a disability or impairment which may affect your capacity to safely participate in laboratory or workshop activities, and you still wish to participate in such activities, you should contact your laboratory supervisor/course coordinator and/or your local campus Disability Advisor. Staff members should contact their local campus HR Consultant.</li> <li>5. <b>Note:</b> If you are pregnant, you should be aware that many of the hazardous materials used in the laboratory or workshop can potentially harm the foetus. If you have any questions, you should speak with your laboratory supervisor/course coordinator and you may also wish to obtain medical advice.</li> </ol>			
TO BE COMPLETED BY PARTICIPANT			
<b>Family Name:</b>		<b>Given Names:</b>	
<b>School:</b>		<b>Campus:</b>	
Are you aware of any medical condition or other condition (including pregnancy) which may affect your capacity to participate safely in laboratory or workshop activities? (If yes, please specify condition):		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are you currently taking medication or other substances (whether prescribed or not) which may affect your capacity to participate safely in laboratory or workshop activities (e.g. medication with a warning alerting the user is not to drive a motor vehicle or operate machinery whilst taking the medication)?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<p><b>If you answered YES to any questions, you should contact your laboratory supervisor/course coordinator.</b></p> <p><b>You may also be required to undergo a medical assessment to determine your capacity to participate safely PRIOR to undertaking any laboratory / workshop activities.</b></p> <p><b>Heads of School should retain a copy of this form and are also to ensure that all original forms are forwarded to the following administrative units:</b></p> <ul style="list-style-type: none"> <li>• <b>Students – local campus Student Centre, and for students with disabilities – the local campus Disability Advisor;</b></li> <li>• <b>Staff – Human Resources, Strathfield.</b></li> </ul> <p><b>PLEASE NOTE:</b></p> <p><b>All medical information will be used only for the purpose for which it was collected and will not be disclosed to other parties (other than ACU advisors, in accordance with ACU's Privacy Policy or unless permitted by law) without your consent.</b></p>			
<b>Personal Declaration:</b>			
<ol style="list-style-type: none"> <li>1. I declare that I have read and understand this form and that I have completed it to the best of my knowledge and ability, disclosing all relevant facts as they are known.</li> <li>2. I also undertake to immediately advise the laboratory supervisor/course coordinator of any change in my circumstances that may affect my ability to participate safely in any laboratory or workshop activities.</li> </ol>			
<b>Signature:</b>		<b>Date:</b>	

## Appendix 5 - Laboratory Safety Induction Checklist

<b>Laboratory Safety Induction Checklist Staff and Students</b>	
<b>Staff/Student Name</b>	
<b>Staff/Student ID</b>	
<b>School</b>	
<b>Campus</b>	
<b>Inducted by</b>	
<b>Date of Induction</b>	
<b>For Students Only:</b>	
<b>Course/Degree</b>	
<b>Academic Supervisor</b>	

**Staff or Student Supervisor:**

The checklist should be completed as soon as practicable after the staff or student commences and prior to commencement of work in laboratory environments. Tick off each action and sign when the induction is completed. Please retain the checklist and provide a photocopy to the staff member or student.

**Staff Member or Student:**

When you agree that the induction has been completed satisfactorily, sign the form where

	<b>Tick</b>
<b>1. Information</b>	
Location of ACU OHS website for details of ACU OHS Policy and Procedures	
Copy of General Laboratory Safety Guidelines issued and discussed	
Name and contact number of OHS representative in your area (if applicable)	
<b>2. Emergency and First Aid Procedures</b>	
Emergency procedures and location of emergency phones	
Location of fire extinguishers and fire blankets in the area/building	
Action to be taken in the event of an emergency evacuation	
Emergency access and egress points in your building	
Names of emergency wardens in the area	
First aid procedure, including names of first aid officers in the area	
Security procedures on campus	
Additional Information:	

	Tick
<b>3. Reporting Procedures</b>	
Procedures for reporting accidents, incidents and potential hazards to area supervisor and local Campus Operations unit – refer them to HR website	
<b>4. Laboratory Safety</b>	
Location of eye wash stations and safety showers in the area	
Location of hand washing/disinfection facilities in the area	
Personal Protective Equipment (PPE) required while working in the laboratory – Lab coat <input type="checkbox"/> Safety Glasses <input type="checkbox"/> closed-in shoes <input type="checkbox"/> Gloves <input type="checkbox"/>	
Location of: Biological Spill Kit <input type="checkbox"/> Chemical Spill Kit <input type="checkbox"/> Mercury Spill Kit <input type="checkbox"/> Sharps Bin <input type="checkbox"/>	
Other required PPE (Please specify):	
<b>5. General Laboratory Rules</b>	
Broken or out-of-order equipment (danger/lock out tags)	
Procedures for spills/breakages	
Hand washing /decontamination procedures	
Cleaning of protective clothing	
Working in Isolation	
After-hours work	
Use of refrigerators, chillers and freezers	
<b>6 Safe Working Practices for the Laboratory</b>	
Labelling and storage of hazardous substances and dangerous goods (chemicals, reagents etc)	
Manual handling	
Waste disposal procedures for laboratory	
Standard operating procedures for relevant equipment, methods etc	
Location of manufacturers operation manuals for equipment	
Use of high pressure equipment (e.g. autoclaves)	
<b>7. Risk Assessments</b>	
Location of the laboratory's MSDS and hazardous substances registers	
Procedure for risk assessment to be completed prior to experiment/task	
<b>8. Area Specific Hazard Information</b>	
Training required on specific equipment and/or procedures (complete training form)	
Chemical handling procedures	
Biological material handling procedures	
Radioactive material handling procedures	
Use of recycled water	
Immunisation/vaccination requirements	
Licenses/certification requirements (specify)	
Other (Please specify):	
<b>Declaration</b>	
<p>1. <i>I have completed the Laboratory Safety Induction and have satisfactorily received the information in the checklist.</i></p> <p>2. <i>I have read, understood and agree to abide by the individual laboratory rules and the ACU Laboratory Safety Guidelines.</i></p>	
<p>Signed _____ (student/staff member):</p>	

Tick

Signed \_\_\_\_\_ (staff/student supervisor): \_\_\_\_\_  
Date: \_\_\_\_\_

Copies: 1. Laboratory/academic supervisor 2. Staff member/student

## Appendix 6 - Laboratory Safety Assessment Form

<b>OHS Workplace Inspection Checklist for Laboratory Environments</b>	
<b>Campus:</b>	<b>Faculty/School/Unit</b>

<b>Laboratory Type:</b>	
<b>Inspection Date:</b>	
<b>Workplace Inspection Team:</b>	
<b>Name:</b>	<b>Signature:</b>
1.	
2.	
3.	
4.	

✓ = Yes   X = No   NA = Not Applicable

Inspection Items	Y	N	N/A	Comments
<b>Administrative and Miscellaneous</b>				
Is there any evidence of unsafe behaviour outside of the organisational expectations?				
Are SOP's specific to the laboratory developed and implemented?				
Are all staff trained in SOP's and SOP development?				
Are all gas taps labelled?				
<b>Housekeeping</b>				
Are floors clean, dry, and free from slip/trip hazards?				
Is there any accumulation of equipment, redundant substances, contaminated waste or rubbish?				
Is shelving stable, free of extraneous material and not too high?				
Are walkways free of obstruction?				
Are chemical storage facilities in good condition?				
<b>Fire</b>				
Are all fire extinguishers/equipment suitable, appropriately located, mounted and identified?				
Are all fire extinguishers regularly checked?				
Are fire hose reels regularly checked?				
Are fire sprinklers and/or detector heads free from damage?				
Are there an adequate number of trained fire wardens?				
<b>Exits</b>				
Are exits and corridors free from obstruction?				
Are exit signs illuminated and clearly visible?				
Is there an adequate number of exits?				

<b>Inspection Items</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>Comments</b>
Are all exit doors unlocked?				
Is emergency lighting installed?				
<b>Environmental</b>				
Are written procedures available for disposal of chemicals and regular collection of chemical wastes?				
Are all staff members/students trained in environmentally sound waste disposal procedures?				
Are all waste containers appropriately labelled with Class Diamonds?				
Is waste segregated and stored correctly bundled away from drains?				
Are records of waste disposal kept in line with procedures?				
Is there evidence of tipping of waste down sink?				
Are all lights working and lighting levels appropriate for tasks?				
Is ventilation adequate?				
Are there acceptable atmospheric contamination levels (fumes, dust, vapours)?				
Are emergency spill and clean up kits/bins readily available and stocked appropriately.				
<b>Chemical Safety</b>				
Is there an inventory of chemicals available in the laboratory?				
Is the hazardous substance register complete and up to date?				
Are Material Safety Data Sheets available for all hazardous substances stored/used?				
Are all chemicals and containers correctly labelled in line with ACU procedures?				
Are chemicals stored in compatible containers?				
Are chemicals stored in compatible storage areas?				
Are stored chemicals bundled and not near drains?				
Are risk assessments completed for all procedures involving hazardous chemicals?				
Is there any leakage of chemicals evident?				
Is there any storage of chemicals in fume cupboards?				
<b>Flammable Liquids</b>				
Are solvents stored in appropriate containers?				
Are solvents separated from corrosives?				
Are flammables stored in small quantities flammable cabinet?				
Are appropriate warning signs on small quantities cabinet?				
Are dry powder fire extinguishers accessible?				
Are there any flammables stored in domestic refrigerators?				
<b>Compressed Gas Cylinders</b>				
Is the gas name/label on shoulder of each cylinder clearly legible?				
Are cylinders secured by brackets or chains?				
Are fuel cylinders separated from oxidising cylinders?				
Are empty cylinders separate from full cylinders and clearly identified?				
Are acetylene cylinders not in use, stored outside of building?				
Are cylinder valves closed when not in use?				
Are gas leak test procedures developed and implemented?				
Are all gas cylinders stored in a well ventilated area?				

Inspection Items	Y	N	N/A	Comments
<b>Fume Cupboards</b>				
Are electrical services located outside of the chamber?				
Are emergency isolators accessible for electrical and gas services and are they clearly marked?				
Are there warning signs indicating a maximum of 2.5 litres of flammable liquid is permitted in the chamber at any given time?				
Are fume scrubbers installed where appropriate?				
Are fire sprinklers/thermal detector heads fitted where applicable?				
Are fire extinguishers located within 4 metres of fume cupboard?				
Do fume cupboards have a face velocity of 0.5 metres per second?				
Are fume cupboards kept tidy?				
<b>Biological Safety</b>				
Are contaminated waste procedures developed and implemented?				
Are sharps (needles, syringes, pipettes, scalpels, razors, etc) stored appropriately?				
Are risk group category and containment procedures in place and adhered to?				
Are disposable gloves available and used when specimens are handled?				
Is appropriate decontamination of work surfaces in practice?				
Is recombinant DNA project work assessed and certified by the University's Biological and Laboratory and Bio-safety Focus Group and by the Human Research Ethics Committee?				
Are recombinant DNA laboratory areas inspected and certified by the University's Biological and Laboratory Focus Group?				
Is aerosol production minimised and contained?				
<b>Radiation Safety</b>				
Do laboratory designs comply with relevant Aust. Standard requirements and NHMRC guidelines?				
Are specific areas designated for radiation procedures?				
Is appropriate monitoring equipment readily available?				
Are personal monitoring procedures in place?				
Are absorbent materials available to contain spills?				
Is adequate and sufficient shielding provided?				
Is radioactive material securely stored?				
Are radioactive waste/storage procedures in place?				
<b>Electrical Installations</b>				
Is in-service inspection, testing and tagging of portable electrical equipment done in accordance with the procedure for Electrical Equipment Inspection and Testing?				
Are adequate power points available and unobstructed?				
Are switches and power points in good condition (no cracks, loose face plates)?				
Are power leads in good condition with no trip hazards?				
Are circuit breakers and main isolators clearly marked?				
Is there excessive use of extension cords?				

<b>Inspection Items</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>	<b>Comments</b>
Is there any temporary wiring?				
Are double adaptors or piggy back adaptors used?				
Are excessive power boards being used?				
Is a carbon dioxide fire extinguisher adjacent to the switch board?				
Have electrical ignition sources been controlled in flammable environments (e.g. intrinsically safe fittings/equipment)?				
<b>Machinery and Equipment</b>				
Are operating instructions/safety signs adequate and clear?				
Are emergency stop switches accessible and red in colour?				
Do interlocks on machine guards operate?				
Are safety glasses areas clearly sign posted?				
Are moving parts, belt drives, shafts, fans appropriately guarded?				
Are machines and equipment free from obstruction?				
Is there adequate distance between machines and equipment?				
<b>Personal Protective Equipment (PPE)</b>				
Is PPE readily available when required?				
Is PPE stored and maintained correctly?				
Have staff and students been trained in correct use, maintenance and storage of PPE?				
<b>First Aid</b>				
Are there trained first aid personnel?				
Are first aid personnel identifiable?				
Are there first aid kits available and adequately stocked for the level of risk e.g. chemical burns?				
<b>Emergency Procedures</b>				
Have emergency procedures been established for specific hazardous circumstances including spills?				
Are there spill kits relevant to the area available, stocked and identifiable (e.g. Laboratory Spill kit, 240 litre Wheelie Bin)				
Are there adequate staff appropriately trained to deal with low risk spills?				
Are staff and students aware of spill procedures?				
Are emergency plans and contact numbers displayed?				
Are regular evacuation drills carried out?				
Has an evacuation drill taken place in the last 12 months?				
Are emergency manifests established for the facility and available in an accessible area to emergency staff?				
<b>Additional Comments (if applicable):</b>				
_____				
_____				
_____				
_____				



## Appendix 7- Laboratory Risk Assessment Checklist

<b>Laboratory Risk Assessment Checklist</b>	
<b>Campus:</b>	<b>Faculty/School/Unit:</b>
<b>Laboratory Type:</b>	
<b>Assessment Date:</b>	
<b>Assessors Name:</b>	<b>Assessors Signature:</b>
<b>Approved by:</b>	<b>Signature:</b>
<b>Main Laboratory Functions:</b>	

### Part 1 - Hazard Identification

The table below will assist you in identifying hazards when completing the section entitled "*These Hazard Exist*"

<p><b>A Could people be injured or made sick by things such as:</b></p> <ul style="list-style-type: none"> <li>• Noise</li> <li>• Light</li> <li>• Radiation</li> <li>• Toxicity</li> <li>• Infection</li> <li>• High or low temperatures</li> <li>• Electricity</li> <li>• Moving or falling objects (or people)</li> <li>• Flammable or explosive materials</li> <li>• Malenals under tension or pressure (compressed gas or liquid; springs)</li> <li>• Any other energy sources or stresses</li> <li>• Bio-hazardous material</li> <li>• Laser</li> </ul>	<p><b>B What could go wrong?</b></p> <ul style="list-style-type: none"> <li>• What if equipment is misused?</li> <li>• What might people do that they should not</li> <li>• How could someone be killed?</li> <li>• How could people be injured?</li> <li>• What may make people ill?</li> <li>• Are there any special emergency procedures required?</li> </ul>
<p><b>C Can workplace practices cause injury or sickness?</b></p> <ul style="list-style-type: none"> <li>• Are there heavy or awkward lifting jobs?</li> <li>• Can people work in a comfortable posture?</li> <li>• If the work is repetitive, can people take breaks?</li> <li>• Are people properly trained?</li> <li>• Do people follow correct work practices?</li> <li>• Are there adequate facilities for the work being performed?</li> <li>• Are universal safety precautions for biohazards followed?</li> <li>• Is there poor housekeeping? Look out for clutter, torn or slippery flooring, sharp objects sticking out, obstacles etc</li> </ul>	<p><b>D How might these injuries happen to people?</b></p> <ul style="list-style-type: none"> <li>• Broken bones</li> <li>• Eye damage</li> <li>• Hearing problems</li> <li>• Strains or sprains</li> <li>• Cuts or abrasions</li> <li>• Bruises</li> <li>• Burns</li> <li>• Lung problems including inhalation injury/infection</li> <li>• Skin contact</li> <li>• Poisoning</li> <li>• Needle-stick injury</li> </ul>
<p><b>E Imagine that a child was to enter your work</b></p>	<p><b>F What are the special hazards?</b></p>

<p><b>area</b></p> <ul style="list-style-type: none"> <li>Of what, would you warn them to be extra careful?</li> <li>What would do to reduce the harm to them?</li> </ul>	<ul style="list-style-type: none"> <li>What occurs only occasionally - e.g. during maintenance and other irregular work?</li> </ul>
---	---

**These hazards exist: (Please ✓)**

Physical:	Chemical:	Biological:	Mechanical/Ergonomic:	Psycho-social:
Noise	Liquids	Human blood and saliva	Posture	Worry
Vibration	Dusts	Insects	Movement	Work pressure
UV	Fumes	Mites	Repetitive actions	Monotony
X-ray	Fibres	Moulds	Illumination and visibility	Unsocial hours
Laser	Mists	Yeasts		Shift work
Heat and cold	Vapours	Fungi		
Electricity	Gases	Bacteria		
Extremes of pressure	Compressed gases	Viruses		
Heavy weights	Acids	<b>Animals:</b>		
Sharps	Mercury	Rats		
Needles		Mice		
Physical activity, exertion		Rabbits		
		Sheep brain		
		Pig heart		
		Toads		

**Major Equipment:**

Autoclave	Fume hood	Vacuum	Compressed air	Trolleys/mechanical aids
Major sports equipment	Bio-safety cabinet			

**Minor Equipment:**

Bunsen burner	Water bath	Microscope				

**Materials:**


**Waste Generated:**

Biological	Chemical	Carcinogenic	Radioactive	Sharps
Gloves	Plastic apron			

**Waste disposed of by:**

General waste	Autoclaving	Freezing	Medical waste bin	Incineration
Disinfection	Flushing sink	Fume hood and water	Sharps bin	Glass bin

**To help me prepare for an emergency I may need:**

First Aid training	CPR training	Safety Signs	MSDS	Fire Extinguisher
Evacuation procedures	Spill kit	Australian Standards	Personal Protective Equipment	

<p><b>Emergency contact numbers could be needed for (List extension numbers below)</b></p> <p>Security - First aiders - Floor Warden -</p> <p><b>Emergency phone numbers are posted where?</b></p> <p>On notice board in laboratories and by all telephones (Yes/No)</p>
--

**Part 2 - How to Assess Risk – Explanatory Notes**

<b>ASSESSMENT OF RISK</b>						<b>Risk Score:</b>	
<b>LIKELIHOOD</b> How likely is it to happen?	<b>CONSEQUENCES:</b> How severely it hurts someone (if it happens)?					<b>Score and statement</b>	<b>Action</b>
	Insignificant (no injuries)	Minor (first aid treatment only; spillage contained at site)	Moderate (medical treatment; spillage contained but with outside help)	Major (extensive injuries; loss of production)	Catastrophic (death; toxic release of chemicals)		
<b>Almost certain</b> - expected in most circumstances	<b>3</b> High	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	<b>4</b> Acute	<b>4</b> A: Acute	<b>ACT NOW – Urgent - do something about the risks immediately. Requires immediate attention.</b>
<b>Likely</b> – will probably occur in most circumstances	<b>2</b> Moderate	<b>3</b> High	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	<b>3</b> H: High	<b>Senior management decision is required urgently.</b>
<b>Possible</b> – might occur at some time	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	<b>2</b> M: Moderate	<b>Follow management instructions e.g. policy/guidelines.</b>
<b>Unlikely</b> – could occur at some time	<b>1</b> Low	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>4</b> Acute	<b>1</b> L: Low	<b>OK for now. Record and review if any equipment/ people/ materials/ work processes or procedures change.</b>
<b>Rare</b> - may occur, only in exceptional circumstances	<b>1</b> Low	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>3</b> High		

  

<ol style="list-style-type: none"> <li>To use the matrix, first find the <b>CONSEQUENCES</b> column that best describes the risk. Then follow the <b>LIKELIHOOD</b> row to find the description that best suits the likelihood that the consequence will occur. The risk level is given in the box where the row and column meet.</li> <li>When considering the likelihood of injury or disease, the number of people exposed, the extent of the exposure to the hazard and the likelihood that exposure will result in harm, all to be taken into account.</li> <li>The estimate of likelihood will also depend on the effectiveness of the control in place. <b>It is important to indicate what assumptions are being made about the controls in place.</b></li> </ol>	<p><b>Note:</b></p> <p><b>ACUTE or HIGH Risk</b> must be reported to the School's Senior Management (HOS and/or Executive Dean) and require detailed treatment plans to reduce the risk, where possible, to <b>MODERATE or LOW.</b></p>
---	---

*Adapted from Standards Australia Risk Management AS/NZS 4360: 2004*

## Risk Control

Emphasis is on controlling hazard at source. For instance, for those risks that are assessed as "High", steps should be taken immediately to minimise risk of injury. Use the "hierarchy of controls" as listed below to determine the type of control measures that should be implemented:

Order No.	Control	Example
<i>Firstly</i>	<b>Eliminate</b>	Disposing of unwanted chemicals and out-of-service hazardous equipment, prompt repair of damaged equipment.
<i>Secondly</i>	<b>Substitute</b>	Using water-based instead of a solvent-based paint, using chemicals of lower concentration.
<i>Thirdly</i>	<b>Isolation</b>	barricades around trenches, fume cupboards, bio-safety cabinets.
<i>Fourthly</i>	<b>Engineering</b>	Ensure proper machine guarding, ventilation and extraction systems
<i>Fifthly</i>	<b>Administrative</b>	Appropriate training to all staff, provision of adequate warning signs
<i>Sixthly</i>	<b>Personal Protective Equipment</b>	Use of gloves, glasses, ear muffs, aprons, safety footwear, dust masks, etc.

## Part 3 – Completion of Laboratory Risk Assessment

Now that you have identified the hazards and using the information above, complete the following Risk Assessment Form. Once the risk assessment has been completed, copies should be provided to:

### Copies:

- 1. Laboratory/Academic Supervisor or their Representative**
- 2. Summary/ Report - Campus OHS Committee Chair** (for tabling at next OHS Committee Meeting)
- 3. Manager, Campus Operations**
- 4. Head of School**

HAZARD IDENTIFICATION		RISK ASSESSMENT		RISK CONTROL			REVIEW	
No.	What harm can happen to people or equipment? <small>(See page 3 for list of possible hazards)</small>	Risk Score* <small>(See Matrix)</small>	List any control measures already implemented	Describe what can be done to reduce the harm? <small>(see Risk Controls)</small>	Whom Responsible	By when	Are the Controls Effective?	Date Finalised

HAZARD IDENTIFICATION		RISK ASSESSMENT		RISK CONTROL			REVIEW	
No.	What harm can happen to people or equipment? <small>(See page 3 for list of possible hazards)</small>	Risk Score* <small>(See Matrix)</small>	List any control measures already implemented	Describe what can be done to reduce the harm? <small>(see Risk Controls)</small>	Whom Responsible	By when	Are the Controls Effective?	Date Finalised

## Appendix 8 – Risk Assessment Tool for Practical Activities/Experiments

Risk Assessment Tool for Practical Activities/Experiments					
Campus:	Faculty/School/Unit				
<p>1. A risk assessment must be carried out for each practical activity or experiment, particularly if they involve the use of a hazardous material. Certain sections of this tool may not be applicable for a particular activity. Only complete applicable sections.</p> <p>2. The Assessor and Course Coordinator should complete the assessment form.</p> <p>3. If the assessor is a student, then the supervising academic should sign the assessment form.</p>					
Assessor's Name:  Assessor's Signature: _____	Course: _____ Unit Code: _____  Lab/Room No: _____ Assessment Date: _____				
<b>Name of Task/Experiment/Process:</b>					
<b>Description of Task/Experiment/Process:</b>					
<b>Task/Experiment/Process to be performed by:-</b> (Please <input checked="" type="checkbox"/> )					
<input type="checkbox"/> Students <input type="checkbox"/> Teaching Staff <input type="checkbox"/> Trained Staff (Detail Specialty/Qualifications):					
HAZARD IDENTIFICATION					
HAZARD ( <input checked="" type="checkbox"/> the Hazard(s))	SAFETY INSTRUCTIONS/CONTROLS ( <input checked="" type="checkbox"/> the control measure(s) used)				
<p style="text-align: center; background-color: #e0e0e0;"><b>Chemical</b></p> <table style="width: 100%;"> <tr> <th style="width: 50%; text-align: center; background-color: #e0e0e0;">Substances</th> <th style="width: 50%; text-align: center; background-color: #e0e0e0;">Potential Hazards</th> </tr> <tr> <td> <input type="checkbox"/> Solids  <input type="checkbox"/> Gases  <input type="checkbox"/> Liquids  <input type="checkbox"/> Chemical Waste(s) /By-Products                             </td> <td> <input type="checkbox"/> Flammable  <input type="checkbox"/> Toxic  <input type="checkbox"/> Corrosive  <input type="checkbox"/> Oxidizing  <input type="checkbox"/> Harmful  <input type="checkbox"/> Irritant  <input type="checkbox"/> Radioactive                             </td> </tr> </table>	Substances	Potential Hazards	<input type="checkbox"/> Solids <input type="checkbox"/> Gases <input type="checkbox"/> Liquids <input type="checkbox"/> Chemical Waste(s) /By-Products	<input type="checkbox"/> Flammable <input type="checkbox"/> Toxic <input type="checkbox"/> Corrosive <input type="checkbox"/> Oxidizing <input type="checkbox"/> Harmful <input type="checkbox"/> Irritant <input type="checkbox"/> Radioactive	<input type="checkbox"/> Avoid known or suspected pregnancy/ allergic reaction(s) <input type="checkbox"/> Dry/Inert atmosphere <input type="checkbox"/> MSDS available <input type="checkbox"/> Spill kits <input type="checkbox"/> Storage facility <input type="checkbox"/> Fire-fighting equipment <input type="checkbox"/> Fume cabinets <input type="checkbox"/> Antidote available <input type="checkbox"/> Other:
Substances	Potential Hazards				
<input type="checkbox"/> Solids <input type="checkbox"/> Gases <input type="checkbox"/> Liquids <input type="checkbox"/> Chemical Waste(s) /By-Products	<input type="checkbox"/> Flammable <input type="checkbox"/> Toxic <input type="checkbox"/> Corrosive <input type="checkbox"/> Oxidizing <input type="checkbox"/> Harmful <input type="checkbox"/> Irritant <input type="checkbox"/> Radioactive				
<input type="checkbox"/> Static discharge protection <input type="checkbox"/> Placarding indicating use <input type="checkbox"/> MSDS information known <input type="checkbox"/> Safety Equipment <input type="checkbox"/> Emergency Procedures <input type="checkbox"/> PPE/Blast shield/Respirator <input type="checkbox"/> SOP's <input type="checkbox"/> Spill cleanup procedures <input type="checkbox"/> First Aid					
<b>Chemical Name(s):</b>					
<div style="background-color: #ccc; width: 20px; height: 15px; margin-left: 10px;"></div>					

HAZARD IDENTIFICATION			
HAZARD ( <input checked="" type="checkbox"/> the Hazard(s))		SAFETY INSTRUCTIONS/CONTROLS ( <input checked="" type="checkbox"/> the control measure(s) used)	
<b>Biological</b> <input type="checkbox"/> Bacteria <input type="checkbox"/> Viruses <input type="checkbox"/> Fungi <input type="checkbox"/> Human/Animal Body Fluids <input type="checkbox"/> Human/Animal Blood <input type="checkbox"/> Parasite <input type="checkbox"/> Cell lines <input type="checkbox"/> Poisonous substance(s) <input type="checkbox"/> GMO organism <input type="checkbox"/> Recombinant construct in live agents <input type="checkbox"/> Animal/Human Tissue		<b>Route of Infection:</b> <input type="checkbox"/> Inhalation <input type="checkbox"/> Needle Stick <input type="checkbox"/> Skin/eye contact <input type="checkbox"/> Ingestion <input type="checkbox"/> Bites/Scratches <input type="checkbox"/> Aerosol Transmission <input type="checkbox"/> Vaccination <input type="checkbox"/> Health Surveillance <input type="checkbox"/> Appropriate storage <input type="checkbox"/> Spill Kits <input type="checkbox"/> Decontamination protocol <input type="checkbox"/> Waste disposal systems <input type="checkbox"/> First Aid <input type="checkbox"/> PPE <input type="checkbox"/> Other: <input type="checkbox"/> SOP's <input type="checkbox"/> MSDS for chemical agents <input type="checkbox"/> Training – staff/students <input type="checkbox"/> Emergency procedures <input type="checkbox"/> Spill cleanup procedure <input type="checkbox"/> Safety Equipment	
<b>List Substance/Organism Name(s):</b>			
HAZARD ( <input checked="" type="checkbox"/> the Hazard(s))		SAFETY INSTRUCTIONS/CONTROLS ( <input checked="" type="checkbox"/> the control measure(s) used)	
<b>Sharps/Needles</b> <input type="checkbox"/> Pipette <input type="checkbox"/> Scissors <input type="checkbox"/> Scalpels/Blades <input type="checkbox"/> Glassware <input type="checkbox"/> Syringes <input type="checkbox"/> Other:		<input type="checkbox"/> First Aid <input type="checkbox"/> PPE <input type="checkbox"/> Disposal Bins <input type="checkbox"/> Other: <input type="checkbox"/> Training <input type="checkbox"/> Sterilisation procedures <input type="checkbox"/> Clean up procedures	
<b>Electrical</b> <input type="checkbox"/> 240 volt <input type="checkbox"/> High voltage <input type="checkbox"/> Power loss <input type="checkbox"/> Other:		<b>Potential Consequences:</b> <input type="checkbox"/> Electrical shock <input type="checkbox"/> Fire <input type="checkbox"/> Burns <input type="checkbox"/> Fatality <input type="checkbox"/> Other:	
<b>Electrical</b> <input type="checkbox"/> Live electrical equipment is grounded <input type="checkbox"/> Circuit Protection devices <input type="checkbox"/> Regular servicing/testing <input type="checkbox"/> First Aid <input type="checkbox"/> Safe work practices <input type="checkbox"/> Other:		<input type="checkbox"/> Circuit Breaker <input type="checkbox"/> Shut-off switches <input type="checkbox"/> Inspect cords/tags <input type="checkbox"/> Non-sparking induction motors/air motors	
<b>Radiation</b> <input type="checkbox"/> Laser <input type="checkbox"/> Ionising (e.g. gamma) <input type="checkbox"/> Non-ionising (e.g. infrared, microwave) <input type="checkbox"/> Other:		<input type="checkbox"/> Spill Kits <input type="checkbox"/> First Aid <input type="checkbox"/> Appropriate storage <input type="checkbox"/> Appropriate signage <input type="checkbox"/> Other: <input type="checkbox"/> Decontamination protocol <input type="checkbox"/> Codes of Practice followed <input type="checkbox"/> Training of staff/students <input type="checkbox"/> Waste disposal procedures	
<b>Field Trips</b> <input type="checkbox"/> Unserviceable vehicles <input type="checkbox"/> Noise <input type="checkbox"/> Road/Traffic conditions <input type="checkbox"/> Climatic Conditions (e.g. hot, dry, wet, cold) <input type="checkbox"/> Terrain (rivers, desert, rough, mountainous, forest, jungle) <input type="checkbox"/> Remote locality <input type="checkbox"/> Bites/stings <input type="checkbox"/> Working Alone <input type="checkbox"/> Wildlife (e.g. poisonous snakes) <input type="checkbox"/> Fencing (barbed wire, electric)		<input type="checkbox"/> Contaminated soil/water <input type="checkbox"/> Poisonous plants <input type="checkbox"/> Weather conditions <input type="checkbox"/> Hypothermia/Frostbite <input type="checkbox"/> Fatigue <input type="checkbox"/> Manual handling <input type="checkbox"/> Hazardous chemicals <input type="checkbox"/> Firearms/explosives <input type="checkbox"/> Faulty equipment <input type="checkbox"/> Bush fires <input type="checkbox"/> Floods <input type="checkbox"/> Falls (e.g. from heights, into mine shafts) <input type="checkbox"/> Working in water <input type="checkbox"/> Other:	
<input type="checkbox"/> Survival training <input type="checkbox"/> Training - equipment <input type="checkbox"/> PPE & suitable clothing <input type="checkbox"/> Students/staff briefed <input type="checkbox"/> First Aid Kit <input type="checkbox"/> Mobile phone <input type="checkbox"/> Communication & check-in procedures <input type="checkbox"/> Staff/student medical Information checked <input type="checkbox"/> Maps/compass <input type="checkbox"/> Adequate water/food supplies <input type="checkbox"/> Serviceable vehicles <input type="checkbox"/> Other:		<input type="checkbox"/> Driver safety briefings <input type="checkbox"/> Servicing and testing of equipment <input type="checkbox"/> Back-up batteries <input type="checkbox"/> Instructions and safety materials for experiments and activities <input type="checkbox"/> Contact overhead and/or underground power lines <input type="checkbox"/> Staff/student ratio – duty of care <input type="checkbox"/> Emergency procedures <input type="checkbox"/> Fire extinguishers <input type="checkbox"/> Safe work practices	

<b>Thermal</b> <input type="checkbox"/> Hot <input type="checkbox"/> Cold <input type="checkbox"/> Cryogenic <input type="checkbox"/> Other:		<input type="checkbox"/> Heat Mats <input type="checkbox"/> Emergency Procedures <input type="checkbox"/> Insulated gloves <input type="checkbox"/> Tongs <input type="checkbox"/> PPE <input type="checkbox"/> First Aid <input type="checkbox"/> Other: _____	
<b>Machinery/Equipment</b> <input type="checkbox"/> Rotational motion <input type="checkbox"/> Moving parts <input type="checkbox"/> Linear motion <input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Fumes <input type="checkbox"/> Other:		<input type="checkbox"/> Manufacturers' manuals <input type="checkbox"/> SOP's <input type="checkbox"/> Regular servicing <input type="checkbox"/> Training in equipment use <input type="checkbox"/> Guarding <input type="checkbox"/> Appropriate licenses <input type="checkbox"/> Emergency shutdown <input type="checkbox"/> First Aid <input type="checkbox"/> PPE <input type="checkbox"/> Fire extinguishers <input type="checkbox"/> Other:	
<b>Notes:</b> PPE = Personal protective equipment		Safety Equipment = e.g. eye wash/shower, ventilation, fume cupboards	
<b>FURTHER DETAILS: (Must be completed)</b>			
<p>Using the information from the HAZARDS SECTION ticked above. please give details to describe the <b>Risk Priorities</b> or <b>Potential Consequences of this Activity/Experiment</b> (e.g. likelihood and severity of injuries/damage to equipment etc).</p>			
<p>Using the information from the SAFETY INSTRUCTIONS/CONTROLS SECTION ticked above, please give details to describe the <b>Safety Procedures used for this Activity/Experiment:</b></p>			

### ASSESSMENT OF RISK

LIKELIHOOD How likely is it to happen?	CONSEQUENCES: How severely it hurts someone (if it happens)?				
	Insignificant (no injuries)	Minor (first aid treatment only; spillage contained at site)	Moderate (medical treatment; spillage contained but with outside help)	Major (extensive injuries; loss of production)	Catastrophic (death; toxic release of chemicals)
<b>Almost certain</b> - expected in most circumstances	3 High	3 High	4 Acute	4 Acute	4 Acute
<b>Likely</b> – will probably occur in most circumstances	2 Moderate	3 High	3 High	4 Acute	4 Acute
<b>Possible</b> – might occur at some time	1 Low	2 Moderate	3 High	4 Acute	4 Acute
<b>Unlikely</b> – could occur at some time	1 Low	1 Low	2 Moderate	3 High	4 Acute
<b>Rare</b> - may occur, only in exceptional circumstances	1 Low	1 Low	2 Moderate	3 High	3 High

### Risk Score:

Score and statement	Action
<b>4</b> A: Acute	<b>ACT NOW – Urgent</b> - do something about the risks immediately. Requires immediate attention.
<b>3</b> H: High	Senior management decision is required urgently.
<b>2</b> M: Moderate	Follow management instructions.
<b>1</b> L: Low	OK for now. Record and review if any equipment/ people/ materials/ work processes or procedures change.

- 4. ACUTE** (Urgent/Immediate action required, report to senior management detailed action plan required)
- 3. HIGH** (Needs senior management's attention)
- 2. MODERATE** (Follow management instructions)
- 1. LOW** (OK for now, continue activity)

➤ **Note:** ACUTE or HIGH Risk must be reported to the School's Senior Management (HOS and/or Executive Dean) and require detailed treatment plans to reduce the risk to MODERATE or LOW

I am satisfied that the risks are low/moderate and/or adequately controlled and that the resources required will be provided.

Course Coordinator's Name:

Course Coordinator's Signature: \_\_\_\_\_

Date:

- **High Risk Assessment** – HOS's Signature is required. A detailed action plan to reduce or control the risk needs to be developed.
- **Acute Risk Assessment** – Refer to Executive Dean. Executive Dean's Signature is required and detailed action plans are required to reduce or minimise risk before activity can proceed.

HOS/Executive Dean's Name :

HOS/Executive Dean's Signature: \_\_\_\_\_

Date:



**ASSESSMENT OF RISK**

<b>LIKELIHOOD</b> How likely is it to happen?	<b>CONSEQUENCES:</b> How severely it hurts someone (if it happens)?					<b>Risk Score:</b> _____	<b>Details of Required Control Measures</b>												
	Insignificant (no injuries)	Minor (first aid treatment only; spillage contained at site)	Moderate (medical treatment; spillage contained but with outside help)	Major (extensive injuries; loss of production)	Catas-trophic (death; toxic release of chemicals)		Elimination, Substitution or Reduction of Quantities of hazardous chemical(s) should be considered:												
<b>Almost certain</b> - expected in most circumstances	<b>3</b> High	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	<b>4</b> Acute	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;">Score and statement</th> <th style="width:85%;">Action</th> </tr> </thead> <tbody> <tr style="background-color: red; color: white;"> <td style="text-align:center;"><b>4</b> A: Acute</td> <td><b>ACT NOW – Urgent - do something about the risks immediately. Requires immediate attention.</b></td> </tr> <tr style="background-color: orange;"> <td style="text-align:center;"><b>3</b> H: High</td> <td><b>Highest management decision is required urgently.</b></td> </tr> <tr style="background-color: lightblue;"> <td style="text-align:center;"><b>2</b> M: Moderate</td> <td><b>Follow management instructions.</b></td> </tr> <tr style="background-color: green;"> <td style="text-align:center;"><b>1</b> L: Low</td> <td><b>OK for now. Record and review if any equipment/ people/ materials/ work processes or procedures change.</b></td> </tr> </tbody> </table>	Score and statement	Action	<b>4</b> A: Acute	<b>ACT NOW – Urgent - do something about the risks immediately. Requires immediate attention.</b>	<b>3</b> H: High	<b>Highest management decision is required urgently.</b>	<b>2</b> M: Moderate	<b>Follow management instructions.</b>	<b>1</b> L: Low	<b>OK for now. Record and review if any equipment/ people/ materials/ work processes or procedures change.</b>	<b>Required Engineering Control</b> Isolation <input type="checkbox"/> Ventilation <input type="checkbox"/> Inert Atmosphere <input type="checkbox"/> Containment <input type="checkbox"/> Local Exhaust <input type="checkbox"/> Remove Ignition <input type="checkbox"/> Blast Protection <input type="checkbox"/> Fume Cupboard <input type="checkbox"/> Other <input type="checkbox"/>		
Score and statement	Action																		
<b>4</b> A: Acute	<b>ACT NOW – Urgent - do something about the risks immediately. Requires immediate attention.</b>																		
<b>3</b> H: High	<b>Highest management decision is required urgently.</b>																		
<b>2</b> M: Moderate	<b>Follow management instructions.</b>																		
<b>1</b> L: Low	<b>OK for now. Record and review if any equipment/ people/ materials/ work processes or procedures change.</b>																		
<b>Likely</b> – will probably occur in most circumstances	<b>2</b> Moderate	<b>3</b> High	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	Use of Administrative measures to reduce duration of exposure:													
<b>Possible</b> – might occur at some time	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>4</b> Acute	<b>4</b> Acute	<b>Required Personal Protective Clothing/Equipment to be used (record type)</b> Gloves: _____    Coat/Apron: _____ Eye Protection: _____    Boots: _____ Respirator: _____    Other: _____													
<b>Unlikely</b> – could occur at some time	<b>1</b> Low	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>4</b> Acute	Level of Training/Supervision required:													
<b>Rare</b> - may occur, only in exceptional circumstances	<b>1</b> Low	<b>1</b> Low	<b>2</b> Moderate	<b>3</b> High	<b>3</b> High														

**CONCLUSION OF RISK ASSESSMENT (Based on Risk Score)**

<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>4. ACUTE</b> (Urgent/Immediate action required)</li> <li><input type="checkbox"/> <b>3. HIGH</b> (Highest management decision is required)</li> <li><input type="checkbox"/> <b>2. MODERATE</b> (Follow management instructions)</li> <li><input type="checkbox"/> <b>1. LOW</b> (OK for now, continue activity)</li> </ul> <p>I am satisfied that the risks are low/moderate and/or adequately controlled and that the resources required will be provided.</p> <p>Course Coordinator's Name: _____</p> <p>Course Coordinator's Signature: _____ Date: _____</p>	<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. If you are unable to tick moderate or low risk with adequate controls, then <b>FURTHER ASSESSMENT</b> is needed and the practical/experiment should not proceed.</li> <li>2. <b>High/Acute Risk</b> – <b>FURTHER ASSESSMENT</b> and detailed action plans are needed. HOS or Executive Dean's approval is required for practical/experiment to proceed.</li> </ol> <ul style="list-style-type: none"> <li>• <b>High Risk Assessment</b> – HOS's Signature is required.</li> <li>• <b>Acute Risk Assessment</b> – Refer to Executive Dean. Executive Dean's Signature is required and detailed action plans are required to reduce or minimise risk before activity can proceed.</li> </ul> <p>HOS/Executive Dean's Name : _____</p> <p>HOS/Executive Dean's Signature: _____ Date: _____</p>
--	---

## Appendix 10 – Guidelines for Developing Safe Laboratory Practices in ACU Anatomy Laboratories

### Background

The Australian Catholic University's (ACU) School of Physiotherapy's Anatomy Laboratories located at its Banyo and MacKillop Campuses are provided for the teaching, learning and research of anatomy.

Staff, students, visitors and contractors accessing the anatomy facility should understand that legislation exists that places an obligation on the University to manage the anatomy facility in a judicious manner and demands the appropriate conduct of users. The University recognises the enormity and solemnity of the contribution that is made by those who donate their bodies for the purpose of providing learning resources to health practitioners, and by the loved ones of donors. The University is committed to treating the human remains entrusted to its care with the utmost respect and professionalism, and requires its employees and students to obey and uphold all legal, public health and ethical standards associated with the handling of bodies and human tissues.

### Statutory Requirements

ACU has a legal responsibility for the licensing and safe operation of Anatomy Laboratories, as outlined in several areas of Australian law including but not limited to:

National Standards	New South Wales	Queensland
<ul style="list-style-type: none"> <li>• AS 2243 – Safety in Laboratories, Parts 1-10 (access is possible via the ACU Library electronic publications)</li> <li>• <a href="#">National Standard for the Storage and Handling of Workplace Dangerous Goods [NOHSC:1015(2001)]</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Occupational Health and Safety Act 2000 and Regulations (2001)</a></li> <li>• <a href="#">Anatomy Act, 1977</a></li> <li>• Human Tissue Act, 1983</li> <li>• Public Health (Disposal of Bodies) Regulation, 2002</li> <li>• Human Tissue and Anatomy Amendment Legislation Act (2003)</li> <li>• New South Wales Department of Health relevant policies and guidelines</li> <li>• Local Government Regulation</li> <li>• Anatomy Facilities, Standards, Maintenance and Operation</li> <li>• Management of Hazardous Materials as per the OHS Regulations 2001.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Workplace Health and Safety Act 1995 and Regulations (2008)</a></li> <li>• <a href="#">The Transplantation and Anatomy Act (1979), Regulations (2004) and Amendment (2006);</a></li> <li>• The Queensland Criminal Code.</li> <li>• Queensland Department of Health's relevant policies</li> <li>• Local Government Regulation</li> <li>• Anatomy Facilities, Standards, Maintenance and Operation</li> <li>• Dangerous Goods Act and Regulations 2001</li> </ul>

This appendix should also be read in conjunction with the following School of Physiotherapy and ACU policy documents:

- [Interim ACU Laboratory Safety Guidelines](#)
- *General Summary of Anatomy Laboratory Procedures*
- *ACU Anatomy Laboratory Code of Conduct*
- *ACU Anatomy Laboratory Rules*
- *ACU Anatomy Policy*

## Key Definitions

For the purposes of this document, the key definitions are as per the definitions provided in *the ACU Anatomy Policy*.

## Policy Statement

ACU acknowledges its responsibility to protect the health and safety of all staff, students, contractors and visitors to the Anatomy Laboratories and undertakes to comply as far as it is reasonably practicable to do so with the Australian Standard AS 2243 – *Safety in Laboratories, Parts 1-10* and the relevant State/Territory Occupational Health and Safety (OHS), Anatomy and Hazardous Materials/Dangerous Goods legislation and regulations.

ACU will also as far as it is reasonably practicable to do so, minimise the risks associated with Anatomy Laboratory activities by providing a safe and healthy environment for all staff, students, contractors and visitors.

## Application

The ACU Anatomy Facilities Safety Guideline applies to all University staff, students, contractors and visitors.

## Roles and Responsibilities Key Stakeholders

The University recognises that the effective provision of safe work environments and safe systems of work place reciprocal responsibilities on staff, management, students, visitors and contractors. Those responsibilities are described in detail in [Section 4.1 of the Interim ACU Safety Laboratory Guidelines](#).

In addition to the general health and safety responsibilities; the following additional responsibilities must be implemented to meet the individual State Health Department Licensing requirements for the conduct of anatomical examinations within the University's Anatomy Facilities:

- University anatomy facilities covered by a license to conduct anatomical examinations (e.g. mortuaries, laboratories, museums) must comply with the standards set out in the NSW and Queensland Acts and Regulations described above.
- The Licensee (by nomination the Assistant Head, School of Physiotherapy) is responsible for monitoring the University's compliance with these licensing provisions and ensuring that the University retains or, where necessary, updates its license to conduct anatomical examinations. In fulfilling this responsibility the Licensee may seek whatever advice or assistance they deem necessary.
- The Director, Properties and local Campus Manager, are expected to support the Licensee in meeting compliance requirements with respect to the maintenance of the University's anatomy facilities. In this respect the Director, Properties and local Campus Operations Unit are responsible for:
  - Ensuring all the University's anatomy facilities are maintained in a state that is compliant with the mortuary standards set out in the Acts and Regulations;
  - Reporting anatomy facility compliance issues, including potential issues, to the Licensee as soon as practicable to enable any necessary remedial action to be taken; and
  - Assisting the Licensee in addressing any anatomy facility non-compliance issues
- The Australian Catholic University expects employees, students and visitors to cooperate with any reasonable request or instruction issued by the Licensee, or their nominees, to enable the University to fulfil its obligations with respect to these licensing requirements.

## ACU's Duty of Care Responsibilities

The Queensland, NSW and the impending National OHS Model legislation (due for implementation January 2012) are based on the principles of duty of care and due diligence within all workplaces. Therefore, implementing the duty of care principle at ACU workplaces requires attention to the planning for the prevention of workplace accidents, injuries and illnesses. There is a general duty of care on the University to ensure the health, safety and welfare at work of all employees and others who come on to the workplace, especially potentially hazardous work areas such as the Anatomy Laboratory. It is the University's responsibility to ensure that all reasonably practicable measures have been taken to control risks against all possible injuries arising from the workplace. The employer's duty of care applies to all people in the workplace, including visitors and contractors.

Furthermore, given the unique nature and the type of activities carried out in the University's anatomy facilities, the duty of care will also include the following considerations:

- Students and authorised lab users may feel distressed when first encountering human bodies, sections or tissues, and/or they may raise issues of grief. There is also a slight possibility that a student may recognise a body as a person they may have known prior to that person's death (e.g. a relative, friend or neighbour). School staff members are aware of these potential problems and are expected to respond sympathetically and appropriately.
- Students and authorised lab users will have access to University Counsellors to help resolve these issues.
- To enable staff to provide assistance and take steps to rectify the situation, students and authorised lab users are encouraged to inform staff as soon as possible if they feel there may be a potential problem, they are experiencing any anxiety or grief or they may have known a donor
- All concerns of student and authorised lab users will be treated confidentially.

## Safety and Risk Management Procedures

The procedures outlined below should be seen as an essential step in preventing injuries and accidents in the University's anatomy facilities, and in meeting the University's legislative, regulatory and licensing obligations.

### 1. General Laboratory Safety

The Head of School is responsible for developing Anatomy Laboratory Safety Rules which should be distributed to all staff and students. Prior to entry to an anatomy laboratory, all visitors and contractors should be made aware of the general safety rules.

The *ACU Anatomy Laboratory Rules* has been developed by the School of Physiotherapy and documents the general safety rules for anatomy facilities on ACU campuses. The document provides guidance on:

- **Workplace Health and Safety including**
  - Notification of medical conditions, especially those staff and students who may be pregnant, as exposure to certain chemicals may harm the foetus,
  - The requirement for all staff and students to be vaccinated against Hepatitis A & B, measles, mumps, pertussis, rubella and tetanus.
  - Following emergency procedures in the event of an emergency
  - Reporting all incidents and accidents to their supervising staff member
  - No eating or drinking in the lab
  - Hands to be washed before leaving the facility
- **Security and Access to the facility including:**
  - Restriction of access to those staff and anatomy students, appropriately approved Campus Operations and contract cleaning staff.

- Visitors and contractors should only be admitted if approval from the Head of School has been obtained and they should be escorted at all times.
  - Student ID to be carried and students are to be supervised at all times
  - Bags and backpacks must be kept in the bag racks provided
  - Use of mobile phones and pagers is prohibited
  - Recording of images is not permitted without the approval of the Head of School
  - Labs should be secured when not in use.
- **Lab Attire including:**
    - Lab coats and enclosed footwear must be worn at all times
    - Gloves and eye protection must be worn whenever human specimens are in use
    - Long hair tied back, with sunglasses and hats removed before entering the lab
    - Contact lenses should not be worn due to the risk of exposing eyes to harmful chemicals.
- **General Housekeeping**
    - Personal Hygiene including washing hands and removal of gloves
    - Care of wet specimens
    - Ensuring anatomy models do not come into contact with wet specimens and contaminated gloves
    - Keeping floors, fire exits and aisles tidy, clean and free of obstruction
    - Thorough cleaning of work areas and equipment after use
    - Cleaning up spills immediately and informing lab staff

Staff and students are also required to read the *Anatomy Laboratory Staff and Student Code of Conduct*. The *ACU Anatomy Policy* provides further details in relation to the receipt, handling, storage and disposal of donated human bodies and tissue.

The University will not tolerate any activity that devalues the contribution of those who donated their remains for medical or scientific purposes. Furthermore, those staff and students who do not comply with these safety guidelines, who do not show the donated bodies due respect and dignity and who do not comply with the *Anatomy Laboratory Staff and Student Code of Conduct* may be excluded from the facility and may also be subject to prosecution under National and State legislation.

## 2. Hazard Identification & Risk Assessment

An inherent part of Australian OHS legislation is the requirement for workplaces to undertake risk assessments on all of their activities which may impact the health and safety of staff, students, visitors and contractors. Given the nature of the activities carried out and the type of materials stored in an anatomy laboratory there are certain hazards that have the potential to cause harm to the health and safety of staff and students. The Head of School (or nominee) and/or Lab Manager must use a risk management process to help manage any risks or identified hazards:

- Step 1: Identify the hazard
- Step 2: Assess risk
- Step 3: Controlling the risk

The School of Physiotherapy is required by Australian OHS law to develop and implement in consultation with laboratory and academic staff and/or local Health and Safety Representative/Committee Member, a laboratory risk assessment protocol based upon the [ACU Occupational Health and Safety Risk Management Program Guidelines](#). The guidelines will assist laboratory risk assessment teams to follow the standard risk assessment process of **Identification, Assessment and Control** for all of the major hazard groups that are likely to be present in anatomy laboratories, which may include but are not limited to:

- Manual Handling Hazards
- Sharps, Equipment and Process Hazards
- Chemical Exposure Hazards
- Biological Exposure Hazards

By reviewing the various laboratory work areas and activities against each of the major hazard groups, a comprehensive assessment will be produced that incorporates all of the OHS and Anatomy legislative requirements and University standards. The risk assessment forms provided at [Appendices 6, 7, 8 and 9](#) of the *Interim ACU Safety Laboratory Guidelines*. have been designed to allow assessment teams to quickly and comprehensively identify and assess the hazards in the laboratory, rank them in terms of priority and provide guidance for the development of appropriate control measures. The forms are generic in nature and therefore, can be adapted to meet the School's needs.

- Laboratory inspections are an important part of the risk management process, serving to both identify hazards and to review the adequacy of risk control measures. The inspections undertaken may vary in formality but generally would take the form of:
- **Walk-throughs** – walking around to check for things which may be out of the ordinary; these would most likely be completed by laboratory staff on a daily basis;
- **Safety inspections** – may be performed by the local OHS Committee and/or laboratory/academic staff using a checklist similar in nature to [Appendix 6](#); and
- **Safety audits** – these are more formal and may focus on the risk management systems. [Appendix 7](#) may be of use during such an audit. The audit team may include for instance, the Lab Manager, an OHS Committee Member//HSR and the local Campus Manager.
- **Records** should be kept of all safety inspections and audits in accordance with OHS and Anatomy Legislative requirements.

The Laboratory and Bio-safety Focus Group has oversight of safety inspections and audits and would receive reports of the inspections/audits outcomes. Additionally, copies of inspection reports and audits should also be provided to the Campus Operations Unit, Head of School with a summary provided to the local Campus OHS Committee.

In relation to risk, time and expertise should be invested on selecting an appropriate control measure and instigating it. Supervising academics and laboratory managers are responsible for following through and ensuring the controls are put in place by the work area or support services as appropriate. Risk assessments should relate to any work or learning activity that is to be undertaken in a laboratory or associated facility. Please refer to [Appendices 8 and 9](#)

The assessment and management of risk is an ongoing process and must be continually evaluated to reflect changes in the quantity or type of hazardous substances present in the laboratory, types of procedures to be performed, and current regulations and recommendations from statutory OHS and Health authorities regarding safe laboratory practices in an anatomy laboratory.

### 3. Reporting of Accidents and Incidents

All persons at a workplace are responsible for recording and reporting incidents involving students, staff and visitors. All incidents/accidents/near misses should be reported using the [Accident and Incident Report Form](#). Students should report any incident in the first instance to staff, who then should report the incident using the [Accident and Incident Report Form](#). Where required, First Aid assistance should be provided by a designated Campus First Aid Officer or by an appropriately trained staff member and where deemed necessary, Emergency Services called.

If the injury is serious or fatal or the incident is considered dangerous, then State OHS Statutory Authorities may need to be informed. Please refer to the [ACU Accident Reporting Guidelines](#) for further information on the statutory reporting requirements of accidents/incidents.

### 4. First Aid

Supervising academic staff, laboratory staff and designated Campus First Aid Officers should be familiar with their responsibilities for providing first aid services and facilities (e.g. First aid kits) as outlined in the [ACU First Aid Procedures](#). Each ACU campus has a number of appointed designated First Aid Officers (FAO) who are on call. However, The Head of School is encouraged to make known to their staff and students those laboratory or

academic staff, other than a designated FAO, who may hold appropriate Advanced or Senior First Aid qualifications.

Injuries of any type should be reported immediately to the academic or laboratory staff member for assessment and, if required, treatment. An [Accident and Incident Report Form](#) should be completed and submitted to the local Campus Operations unit as soon as possible.

Should a serious incident occur at some time, e.g. an explosion, all staff and students involved should attend a debriefing session. If students require post-incident counselling, they should be referred in the first instance to the University Counselling Service. Staff are able to seek appropriate counselling services through the University's Employment Assistance Provider, [ACCESS Programs Australia \(1800 81 87 28\)](#).

## 5. Induction and Training

The Head of School and/or their nominee shall ensure that all laboratory and academic staff, students, visitors and contractors that are required to use the Anatomy Laboratories or have responsibility for biological, chemical and human remains/tissue and/or lab equipment receive induction and refresher training which includes sufficient information and instruction to enable staff, visitors, contractors and students to handle these substances and equipment safely.

A generic **Safety Induction Form** checklist is included as Appendix 5 of the [Interim ACU Safety Laboratory Guidelines](#). It is recommended that the School tailors this form to suit an induction for the Anatomy Laboratories. The School of Physiotherapy is also required to keep records of all induction and training programs implemented within the School.

## 6. Chemical and Biological Safety

In order to better manage the biological and chemical safety within all ACU Laboratories including the Anatomy Laboratories, a National Laboratory and Bio-Safety Focus Group, comprising a nominated representative from each campus and the OHS and Wellbeing Coordinator, acting as the Executive Officer, will be established to oversee and monitor, via quarterly meetings, the implementation and review of the ACU Laboratory Safety Guidelines including the Anatomy Laboratory Safety Guidelines.

ACU has certain legal and regulatory obligations under State/Territory OHS and dangerous goods legislation and Australian standards relating to chemical management and in particular, the management of hazardous substances and dangerous goods in the workplace. Please refer to [Appendix 1 of the Interim ACU Safety Laboratory Guidelines](#) for a list of references as they apply to chemicals, dangerous goods and hazardous substances. The School will develop procedures for the management of chemicals, including the conduct of [chemical risk assessments](#), maintenance of risk registers and Material Data Safety Sheets (MSDS), the labelling of containers and the storage/disposal of chemicals in accordance with the legislative and regulatory requirements detailed in Appendix 1.

The University also recognises that staff, students, contractors and visitors working and studying at ACU may handle or be exposed to biological materials, including human blood and body fluids that put them at risk of contracting infection from HIV, the hepatitis viruses or other blood-borne pathogens. In addition, in the clinical setting, students and supervising staff may be exposed to other potentially infectious materials.

As Anatomy Laboratories handle biological materials including human remains, the School is expected to develop, implement and monitor procedures and guidelines for biological safety. In particular, most of the procedures for the receipt, handling, storage and disposal of human remains are detailed in *ACU Anatomy Policy*. The bio-safety and chemical management procedures and guidelines will be overseen and reviewed by the Laboratory and Bio-safety Focus Group.

## 7. Spills Management

Spills emergency plans must be developed, where applicable, for all anatomy laboratories and personnel trained in how to implement the plan(s) and specific procedures that must be followed. MSDS must be readily accessible for all chemicals used in the laboratory. Information regarding how to manage spills should be read

and understood by all staff and students who work or learn in the laboratory. **Sections 6.6.3.1 – 6.6.3.3** in the [Interim ACU Safety Laboratory Guidelines](#) outlines the procedures for the handling and management of spills

All anatomy laboratories should be provided with a spill kit appropriate to control the risk associated with a spill of the type of hazardous material(s) (e.g. chemical, biological) being used in the laboratory. Notwithstanding the outcome of a laboratory risk assessment, spill kits must (as a minimum) contain appropriate personal protective equipment, absorbents and neutralisers. To ensure serviceability, all spill kits should be checked on a regular basis by laboratory technical staff. Commercially available kits may be purchased or may be prepared by laboratory/academic staff after referring to appropriate MSDS or other manufacturer or supplier specifications/materials associated with the hazardous material(s).

If a spill does occur students should immediately notify their supervising staff member or laboratory technician and an [Accident and Incident Report Form](#) should be completed as soon as possible.

## **8. Needle Stick/Sharps/Biological Exposure**

Specific protocols should be developed and implemented by the School of Physiotherapy's Laboratory Manager to manage injuries and biological exposure such as those caused by needle-stick, sharps, or mucous membrane exposure to human blood or other body fluids.

The plan should be clear as to who will do what, and should make sure that anyone who will counsel the exposed person has relevant knowledge and experience. Counselling, treatment (to prevent or treat disease) and follow-up as appropriate should be offered. As with all incidents, all needle-stick, sharps and biological exposure incidents should be reported using the ACU [Accident and Incident Report Form](#). In every case, the injury, immediate response and follow-up should all be properly documented.

## **9. Emergency Procedures**

The Head of School is to ensure that all staff, students, visitors and contractors are familiar with the emergency procedures for their particular campus. The [ACU Emergency and Critical Incident Policy](#) does provide further information on how to handle certain emergency situations. The School should also ensure that laboratory inductions inform participants of the location and the correct use of safety equipment. As such, staff and students should be aware of:

- All emergency exits and nearest telephone (emergency phone number list should be prominently displayed);
- Fire alarms, fire extinguishers (type and their use), fire blankets and sand buckets;
- Safety showers and eyewash facilities;
- First Aid Officers and kits, Floor Wardens; and
- Material Safety Data Sheets (MSDS).

In the event of an emergency, staff and students should cooperate fully with key emergency personnel such as First Aid Officers, Floor Wardens and emergency services personnel.

Laboratory managers and/or academics in charge of practical classes are responsible for ensuring that measures are taken to assess the nature and extent of risks posed by hazards and processes in the anatomy laboratory and/or ensure that an effective emergency management plan is developed, implemented and tested for their anatomy laboratory. To ensure compatibility with local Campus Emergency and Evacuation Procedures, the School will need to closely liaise with the local Campus Operations Unit. Individual Laboratory Emergency Plans should also include procedures for handling dangerous goods emergencies.

## **10. Safety & General Equipment**

Safety equipment requirements should be identified for each laboratory through risk assessment and, as such, all laboratories are required to have safety equipment installed and/or available to manage the identified residual risks. Risks assessments should be used to identify the type of safety equipment required for the laboratory, e.g. eye wash stations.

Safety equipment generally falls into three key categories as summarised below:

1. **Fixed** may include but is not limited to safety showers with or without eye wash facilities, eye wash stations, emergency isolation valves and switches, bench mounted fume extraction systems, fume cupboards, drainage pits and approved storage cabinets.
2. **Portable** may include fire extinguishes, fire blankets, first aid kits, sharps and broken glass disposal bins, spill kits, trolleys, electric lifters and protective shields.
3. **Personal Protective Equipment (PPE)** can include items such as lab coats, eye protection (safety glasses, goggles), respiratory protection (masks, respirators), hearing protection and shoes.

Please refer to Appendix 1 of the [Interim ACU Safety Laboratory Guidelines](#), which lists references as they relate to the requirements for laboratory safety equipment.

All general equipment falls within the definition of plant and equipment and as such is subject to ACU's policies on purchasing, installation, training, maintenance and risk assessment. The School is advised to contact their local Campus Operations unit for further information. Safe work practices/safe handling instructions are developed for:

- *The Standards, Maintenance and Operation of Anatomy Facilities in accordance with State legislation;*
- fume cupboards, biological safety cabinets and autoclaves (refer to [Sections 6.10.2, 6.10.3 and 6.10.4](#)),
- liquid nitrogen and laser equipment,
- refrigerators, electrical equipment and plant and equipment,
- spills,
- waste disposal, e.g. biological, chemical, broken glass, sharps waste
- hazards, e.g. human, animal and biological (bacterial and animal cell) cultures,
- infection control, particularly where blood and body fluids are handled, and
- manual handling - in particular, approved anatomy laboratory staff should receive training in the correct use of the electric lifter.

## 11. Disposal of Laboratory Waste

The Head of School, supervising academic staff and laboratory managers should in consultation with their local Campus Operations unit develop procedures for the disposal of waste generated by laboratories under their control. The procedures should protect the health and safety of persons in control of, or exposed to hazardous waste in the workplace, and community in general. The appropriate controls adopted should be environmentally responsible and comply with State/Territory OHS and environmental protection legislation and regulations as well as the *AS/NZS 2243 and AS 4031 series*.

Procedures should be in place for:

- segregation of all waste (*AS/NZS 2243.1, AS/NZS 2243.3, AS/NZS 2243.4 refer*);
- segregation, storage and disposal of chemical and solvent waste;
- segregation, storage and disposal of clinical and biological waste (please note that all clinical and biological waste should be classified as contaminated);
- segregation, storage and disposal of mixed waste;
- storage and disposal of broken glass, needles and sharps;
- training of staff and students in waste management and spills clean-up procedures, and the
- disposal of donated bodies and human tissue in accordance with State Anatomy legislative and Health Department regulatory requirements.

All staff, researchers and students must maintain a high standard of housekeeping and follow all local waste disposal processes.

## **12. Review**

The Anatomy Laboratory Safety Guideline should be reviewed from time to time to ensure continuing licensing and legislative compliance. Any feedback should be provided to the Head of School, School of Physiotherapy.