

UNIVERSITY *of*
TASMANIA

A

SCHOOL OF HEALTH SCIENCES

**LABORATORY
HEALTH AND SAFETY
RULES**

**STUDENT EDITION
(2015 Version 18)**

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1. ABOUT THIS MANUAL

The rules set out in this document apply to the conduct of staff and students working in the laboratories at the School of Human Life Sciences in the Newnham campus of the University of Tasmania.

This manual is designed to assist staff and students in achieving safe work practices and maintaining a safe working environment with regard to chemical and biological substances. However, no finite set of rules will fit all circumstances and the exercise of common sense is essential. If situations occur where doubt exists about safety issues, then senior staff should be consulted.

General laboratory safety practices, the chemical and the biological aspects of safety are detailed in the relevant reference safety document published by the Australian Standards Association:

- “Safety in Laboratories” Australian Standards;
- AS 2243.1 Safety in Laboratories – General
- AS 2243.2 Safety in Laboratories – Chemical
- AS 2243.3 Safety in Laboratories - Microbiology

as well as University policies on Laboratory Safety. Copies of these documents can be obtained from the WHS Website, on-line via the UTAS library site or in the Prep. Room (C222).

Under the Model Workplace Health and Safety Act (2012) section 28, an employee (worker under the terms of the Act) has the following obligations at the workplace –

While at work, workers must:

- take reasonable care for their own health and safety and
- take reasonable care that their own acts or omissions do not adversely affect the health and safety of other persons
- comply, so far as they are reasonably able, with any reasonable instruction given by the PCBU (person conducting a business or undertaking) to allow the PCBU to comply with WHS laws, and
- cooperate with any reasonable policy or procedure of the PCBU relating to health or safety at the workplace that has been notified to workers.

A breach of this Act is punishable by a fine of up to \$300,000 or 5 years imprisonment or both.

Note – a person is a **worker** if the person carries out work in any capacity for a person conducting a business or undertaking, including work as: an employee, a contractor or subcontractor, an employee of a contractor or subcontractor, an employee of a labour hire company assigned to work in the person’s business or undertaking, an outworker, an apprentice or trainee, a student gaining experience, a volunteer or a person of a prescribed class (WHS Act 2012, section 7).

2. GENERAL RULES

1. GENERAL RULES - BUILDING

- b) In the event of an emergency or fire drill, move quickly and carefully from the laboratory to the external stairwell. Never run in the laboratory or along corridors.
- c) Be aware of the position of the exits from all work areas and from all levels of the building.
- d) The procedure to be followed in the event of **fire** in the building is detailed in Appendix 1 and 4. It is important to remain calm and proceed quickly and carefully to the appropriate exit.
- e) The procedure to be followed in evacuation of the building is detailed in Appendix 2. It is important to note the assembly point for evacuees from the building.
- f) Smoking is prohibited in all UTAS buildings at all times.
- g) Footwear should be worn **at all times** in all School buildings. In laboratories it is mandatory that covered footwear be worn.

2. GENERAL RULES – LABORATORIES

- a) All students can access a copy of the *School of Human Life Sciences Laboratory Health and Safety Rules (Student Edition)*. Available on the School website under Student Resources, go to Policies, Guidelines and Forms.
- b) **Students are NOT permitted to enter ANY preparatory laboratory without the permission of the laboratory supervisor/demonstrator or technical staff.**
- c) **Eating and drinking are prohibited in all laboratories.**
- d) Frivolous behaviour, unauthorised experiments and working in the laboratory outside normally assigned hours without permission, are strictly forbidden. Laboratories are open to students only during the times set down for practical work and only in the presence of an academic staff member or assigned demonstrator.
- e) Permission may be granted for students to use a laboratory outside the scheduled practical session subject to the student being under the supervision of a member of the School of Human Life Sciences.
- f) All students must be aware of the conditions required for the safe handling of the substances being used. If in any doubt, seek guidance from your laboratory supervisor/demonstrator.
- g) Be aware of safety facilities of the laboratory, ie location of safety showers, eyewash stations, fire extinguishers, fire blankets, first aid stations and emergency exits.
- h) Working spaces are to be kept clean. Broken glass, sharps, laboratory waste and domestic waste must be placed in the appropriate waste receptacle in the laboratory. No waste is to be left or placed in the sinks, or left at the work area.
- i) All spillages must be cleaned up immediately after they occur. Spills should be reported to the supervisor immediately.
- j) No reagent, solution or apparatus is to be removed from the laboratory without approval from the appropriate academic or technical staff member.
- k) Correct use of Bunsen burners is essential. Never leave a lit Bunsen burner unattended. Avoid “burning back” of your Bunsen burner ie the flame burns back down the barrel of the burner and is visible in the air hole. Usually accompanied by a hollow burning sound and/or the absence of a blue cone. If this happens, turn the bunsen off, wait till it cools, then close the air hole via the sleeve on the barrel, and relight.
- l) In order to protect bench tops, fibre cement pads should be placed under Bunsen burners and hot glassware.
- m) Take care when raising lids on boiling water baths, the steam may cause scalding.
- n) Disconnect power supplies from outlets whilst assembling/disassembling electrophoresis equipment.

3. GENERAL RULES - PERSONAL SAFETY

- a) **All students** are to wear covered footwear during practical classes. **Thongs, open weave shoes, sandals, ballet slippers**, etc. are **NOT** appropriate footwear. Students will **NOT** be permitted to work unless wearing suitable footwear.
- b) All students with long hair must tie up or confine their hair by use of a suitable tie/clip or hair net. A hat or a cap is not suitable and must not be worn.
- c) A **clean** laboratory coat/gown is to be worn at all times during laboratory work. Always remove the laboratory coat/gown when leaving the laboratory after completing work for that session (beware that contaminated laboratory coats are potentially infectious). Gowns that are soiled should be removed for laundering and replaced with a clean gown.
- d) In all laboratories and designated work areas where **eye protection** is required, safety glasses (selected and used in accordance with AS1336, AS1337 and AS1338) must be worn at all times during the course of the laboratory work. For other laboratories and work areas students will be required to wear safety glasses when directed to. **Students who fail to bring safety glasses to laboratory sessions may not be granted access to that session.**
- e) Bags are not permitted in laboratories – students are encouraged to use lockers to store bags and personal belongings. Bags may be left at the owner's risk, in the gowning rooms of some laboratories. Do not block passage ways or fire exits. **Do not** place bags on laboratory benches.
- f) Never develop a casual attitude in the laboratory. Be conscious of potential hazards. **Sitting on laboratory benches is a dangerous practice** and is not permitted. **Never run** in the laboratory or along corridors. Be conscious of **sitting safely on laboratory stools**. Keep all four legs on the floor. Do not lean backwards.
- g) Exercise care in opening and closing doors on entering or leaving the laboratory.
- h) Assume all substances and biological specimens are hazardous and handle accordingly.
- i) In the event of spills on skin, thoroughly wash the affected area with copious quantities of water. Report all injuries, however trivial, to the supervisor or demonstrator in charge of the laboratory session.
- j) Fingers, pens, pencils and work utensils must not be placed in the mouth.
- k) Always wash hands thoroughly before leaving the laboratory. Appropriate hand cleanser is available at all hand wash areas.
- l) Eye injuries, whether caused by chemicals or mechanical injury or splash with biological material are always serious. The treatment is **IMMEDIATE AND PROLONGED FLUSHING WITH WATER** (20 minutes minimum) at the eye wash station. Medical advice should be obtained for any eye injury.
- m) Report all injuries to the laboratory supervisor/demonstrator. First aid will be administered by trained first-aid officers. See First aid signage for names and contact details of First Aid Officers.

3. WASTE DISPOSAL

CATEGORIES OF LABORATORY WASTE

All laboratories will contain the following types of waste:

Type	Description	Example
Clean	Paper towel and other non contaminated waste	Paper towel used to dry hands after washing ONLY .
Sharps	Material capable of causing cuts or injury	All disposable glassware including microscope slides and capillary tubes. Needles.
Biohazard	All other laboratory waste	

Sharps

- Dispose of sharps in designated sharps containers. Always move the sharps container to your work place to dispose of such items. Do not in any circumstances wander around the laboratory carrying sharps.
- The Clicksmart Blade removers are for the removal of disposable scalpel blades only. Read the instructions on the container carefully to avoid damage to the system.
- Full sharps bins are stored with lids securely sealed, in the undercroft for specialist disposal.

Biohazard Bags

These bins are to be used for the disposal of contaminated waste such as gloves and paper towel. **They are not to be used for sharps or any non-contaminated paper waste.** They are labelled with the biohazard symbol. Do not overfill bags. Full bags are to be placed in the yellow wheelie bins for autoclaving.

General Purpose Bins

General-purpose bins are located at the hand-wash sink and in the laboratory and they are to be used for **non-contaminated waste only**.

Chemical waste

Read the SDS for the correct disposal procedure for each chemical and include this information in your risk assessment. Residue bottles are provided in the Prep. room for the storage of waste phenol, waste organics (both halogenated and un-halogenated.). Full containers are stored in the waste cupboard in the under-croft for specialist disposal.

4. CLEANING

Cleaning of General Work Areas

General work areas are to be kept tidy and free of unnecessary equipment. Any equipment used for general work should be returned to its appropriate place. Chemicals should be returned to storage. Benches should be cleaned with the appropriate cleaner.

Bench Cleaners

‘Diversol’ is available. It should be used at a concentration of 5000ppm of available chlorine. It has a limited shelf life and should be freshly made up (pink) in the squirt bottle on the bench. Diversol packets are stored in the cupboard. Diversol is suitable for cleaning biological contamination e.g. blood, serum, urine. A concentration of 5000ppm applied for a period of ten minutes inactivates a biological spill. This concentration is active against hepatitis viruses and HIV

‘Biogram’ may be used at a dilution of 1:150 for bench wiping. A stock solution of undiluted ‘Biogram’ is available in the Prep. Room. ‘Biogram’ is suitable for cleaning microbiological contamination.

‘Viraclean’ – is also available for cleaning and should be used for equipment such as centrifuges. Do NOT use Diversol as it is too corrosive.

‘70% Ethanol’ – is suitable as bench disinfectant where microorganisms have been used.

Spill Clean Up

Any liquid spilt on the floor must be cleaned up immediately to avoid slipping hazards. Refer to the document ‘Laboratory Spill Clean-up’ for detailed procedures in cleaning up chemical or biological spills. They must be dealt with immediately. **Always wear suitable protective clothing before starting a spill clean-up.**

5. CHEMICAL SAFETY

- a) Special care should be exercised in handling strong acids, alkalis, cyanides, phenols etc. If you have any doubts about handling chemical substances you should consult the laboratory supervisor/demonstrator.
- b) Safety Data Sheets (SDS) (previously called Material Safety Data Sheets or MSDS) are available for all chemicals used in the laboratory. SDS's contain comprehensive information about the chemical concerned including information on how spills and contamination events are to be dealt with. Students should familiarise themselves with the content and location of SDS's.
- c) **NEVER PIPETTE BY MOUTH.** Use an appropriate alternative such as a pipette filler or measuring cylinder, whichever is appropriate.
- d) Many organic solvents such as alcohols, ether, acetone, hydrocarbons etc. are highly flammable and require cautious handling. **DO NOT** open bottles of flammable liquids near open flames. Remember that electric motors, hot-plates, pilot lights etc. may ignite flammable vapours.
- e) If a person's clothing catches fire, they should be thrown to the floor and rolled to extinguish the flames quickly. If a fire blanket or laboratory coat is available, it should be used. The victim should **NEVER BE ALLOWED TO STAND UP**, as in the upright position, the natural rise of flames and hot gases will envelop the head and cause injury to respiratory passages and eyes. **NEVER** use an extinguisher of any type on a person. The soda-acid type may damage the eyes whilst the carbon dioxide type may cause severe frostbite.
- f) Report all spillages to the supervisor/demonstrator in charge of the laboratory session. All spillages must be cleaned up immediately after they occur. The procedure used should be suitable for the treatment of the spilt substance, due consideration being given to corrosiveness, fumes, reactivity, toxicity and flammability. Some guidance for the treatment of spills is as follows:
 1. **Acids:** For small spillages of acids, the area should be flushed with water but not to the extent that the spillage is spread unnecessarily. The spillage should be contained with earth or sand and neutralised carefully with sodium bicarbonate.
 2. **Alkalis:** For spillages of alkalis, the spillage should be contained using sand or earth. Citric acid or dilute acetic acid may be used to neutralise the alkali before clean-up. Residual alkali should be washed with water ensuring no contact occurs between washings and any aluminium or zinc containers.
 3. **Organic solvents:** Spillages of organic solvents should be absorbed using sand, diatomaceous earth or a proprietary product suitable for the absorption of the liquid.
- g) Absorption granulate is available in preparation areas. When absorption is complete the material is collected in a polyethylene bag and disposed of by Technical staff.

6. BIOLOGICAL SAFETY

- a) Assume all biological specimens (eg blood, serum, plasma, urine, microbiological cultures) are infectious and handle accordingly. This is known as **Universal Precautions**.
- b) The handling of biological material poses many specific problems in addition to those encountered in chemical laboratories, for example: possibility of infection resulting from ingestion, inhalation or skin penetration.
- c) Airborne infections – aerosols of infectious materials may be formed when removing the stopper or plug from samples, accidental dropping of solutions onto hard surfaces, by centrifuging unstoppered tubes and heating liquids too rapidly, during pipetting (expelling from pipettes creates aerosols), use of an inoculation loop or exploding ampoules of frozen cultures.
- d) Ingestion infection – May occur by mouth via mouth pipetting or eating or by direct hand-to-mouth spread resulting from failure to wash hands thoroughly. **Mouth pipetting is STRICTLY FORBIDDEN.**
- e) Direct inoculation – small scratches or paper cuts on fingers or broken cuticles may be easily contaminated or needle stick injury from contaminated needles. Ensure that cuts and abrasions are covered by bandages at all times in the laboratory. Skin conditions such as eczema, psoriasis or burns also pose additional risk as the integrity of the skin barrier is compromised - these conditions need to be covered with a physical barrier such as a glove or bandage at all times. **NEVER RE-CAP A NEEDLE.**
- f) Any spillages must be immediately reported to the laboratory supervisor /demonstrator. Action must be taken immediately to clean up the contaminated work space. Spills of blood or serum are inactivated by using a solution of hypochlorite that provides 5000-10000 ppm of available chlorine (0.5-1.0 %) for a period of 10 minutes. This concentration is active against hepatitis viruses and HIV.
- g) Hand disinfection facilities are provided in each laboratory. You are advised to make use of them, not only when leaving the laboratory, but also when necessary during classes involving live cultures. Hypochlorite or phenol-based solutions are provided for bench disinfection.

7. ELECTRICAL SAFETY

The University has an 'Electrical Safety in the Workplace Policy' available on the web at <http://www.utas.edu.au/commercial-services-development/work-health-and-safety>

Electricity is dangerous and should always be treated with respect. Be alert to electric shock from exposed wires, damaged insulation on equipment or extension leads, wet conditions in the area where equipment is being used. There is also a risk of fire from overheating of equipment, overloaded circuits etc. You have a responsibility to check for damaged equipment or insulation and report it to the ESR.

Avoid using double adaptors and power boards.

Do not attempt to rewire plugs or sockets. Have all repair work carried out by a qualified person.

There is a testing and tagging procedure in place to check the safety of equipment. Do not operate equipment that does not have an 'in-date' tag.

Heating mantles provide little insulation between live wires and glassware, so make sure the glassware is dry when handling.

Electrocution

A person coming into contact with a live wire may receive an electric shock causing muscular contraction and/ or severe burns. If the heart muscle is affected, this can be fatal or cause the heart to go into ventricular fibrillation. A small current is all it takes to cause cardiac arrest. If you come across someone who has been electrocuted, be aware that the person or the immediate area may be 'live' (conducting electricity). Isolate the power by switching off at the mains or remove the person with an insulated item such as a broom handle or plastic pipe before applying first aid treatment.

Defibrillators are available on campus if needed. Locations near Human Life Science buildings are in the foyer of the library, at Human Movement Reception in G block, in the foyer to Exercise Clinic E016 and there is one inside room G128.

8. REPORTING OF INCIDENTS

Accidents or Incident Report

All accidents and major spills should be documented on an “Incident Report Form”.

Official reporting of incidents is to be done on-line. The form is available on-line at the Workplace Health and Safety site:

<http://www.human-resources.utas.edu.au/health-and-safety>.

The Health and Safety representative for the School of Human Life Sciences is currently Laura Maddock (ext 5463). She can assist with reporting of incidents.

Notification of a Safety Hazard

Staff are encouraged to communicate “near misses” or safety hazards that they have identified, to the Health and Safety Representative, in order to identify “risky practices” and prevent future incidents (or fill in the on-line form at the site above).

The Safety Representative should discuss such episodes with the Occupational Health and Safety Officer and if deemed necessary, complete a “Notification of a Safety Hazard”.

9. APPENDICES

APPENDIX 1

EMERGENCY INFORMATION FOR STAFF AND STUDENTS

Emergency Campus Contacts

Security is available 24 hours. In an emergency phone:

- Hobart: 6226 **7600**
- Launceston and Burnie: 6324 **3336**

Defibrillators are available on campus. Locations close to Human Life Sciences are: the library, the Human Movement Reception in G block and there is one inside room G128.

What to do in case of:

- [Armed holdup](#)
- [Bomb threat](#)
- [Fire](#)
- [Infectious disease](#)
- [Medical emergency](#)
- [Power failure](#)
- [Suspicious mail/package](#)
- [Threatening phone call](#)
- [Violent/threatening person](#)

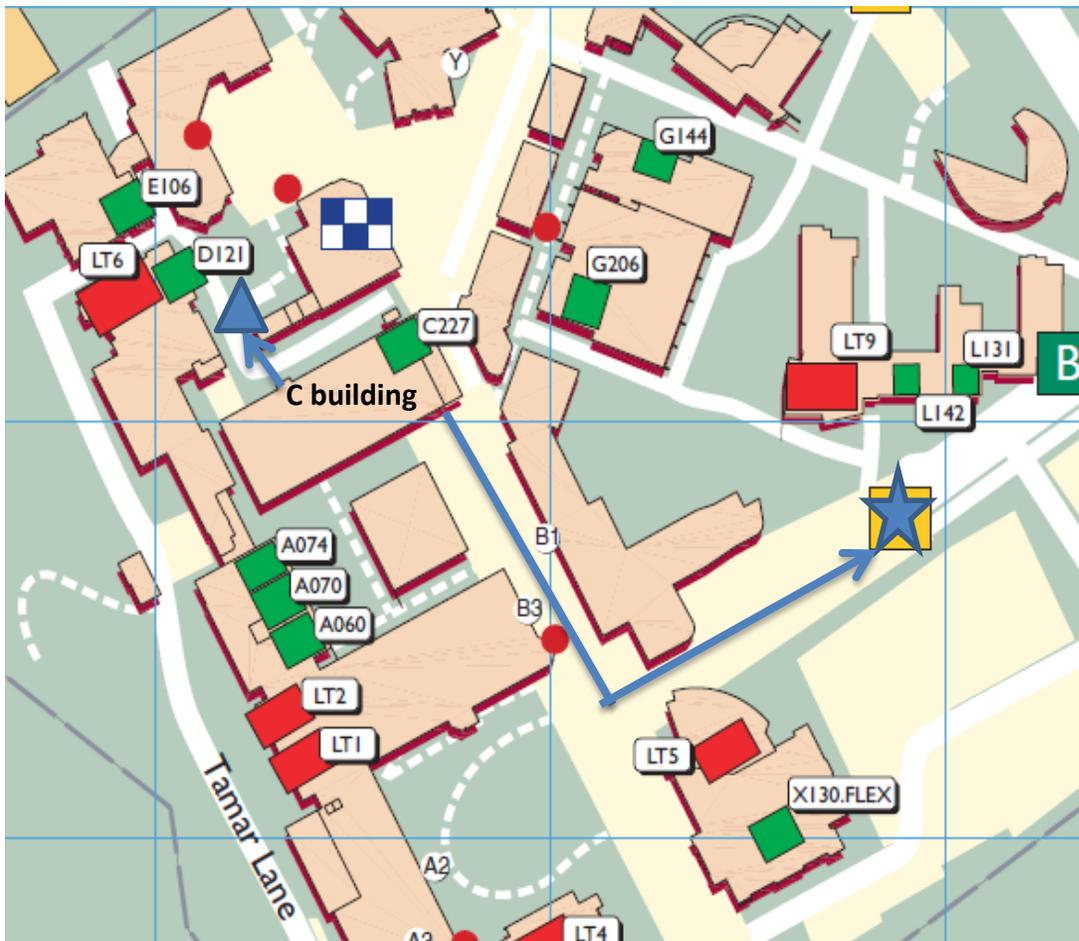
Also see: <http://www.utas.edu.au/commercial-services-development/emergency-management>

APPENDIX 2

Evacuation Assembly Areas

C Building

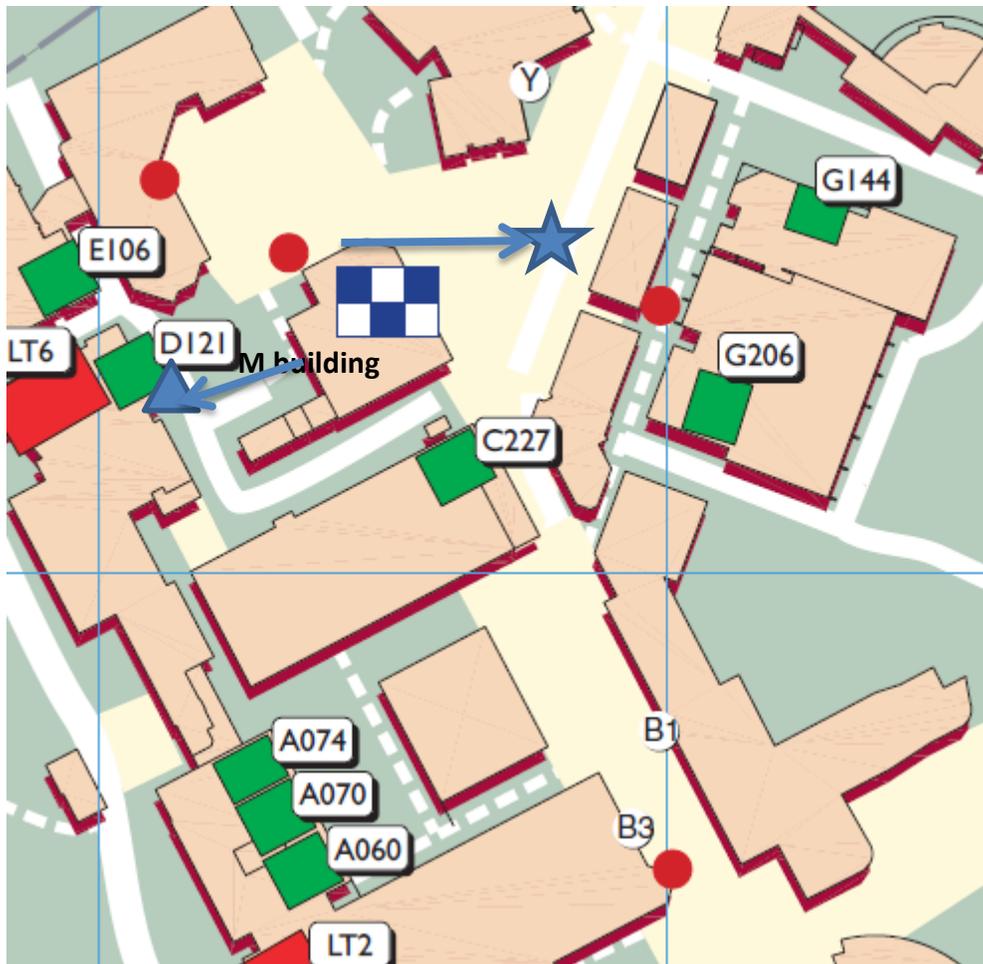
For people on levels 1 and 2, unless otherwise instructed by the person supervising your class or directing the evacuation, proceed from C Building to the turning circle (marked with a star).
For people on level 0, the usual evacuation point is in Tamar Lane, on the grass area behind M building (marked with a triangle).



M Building

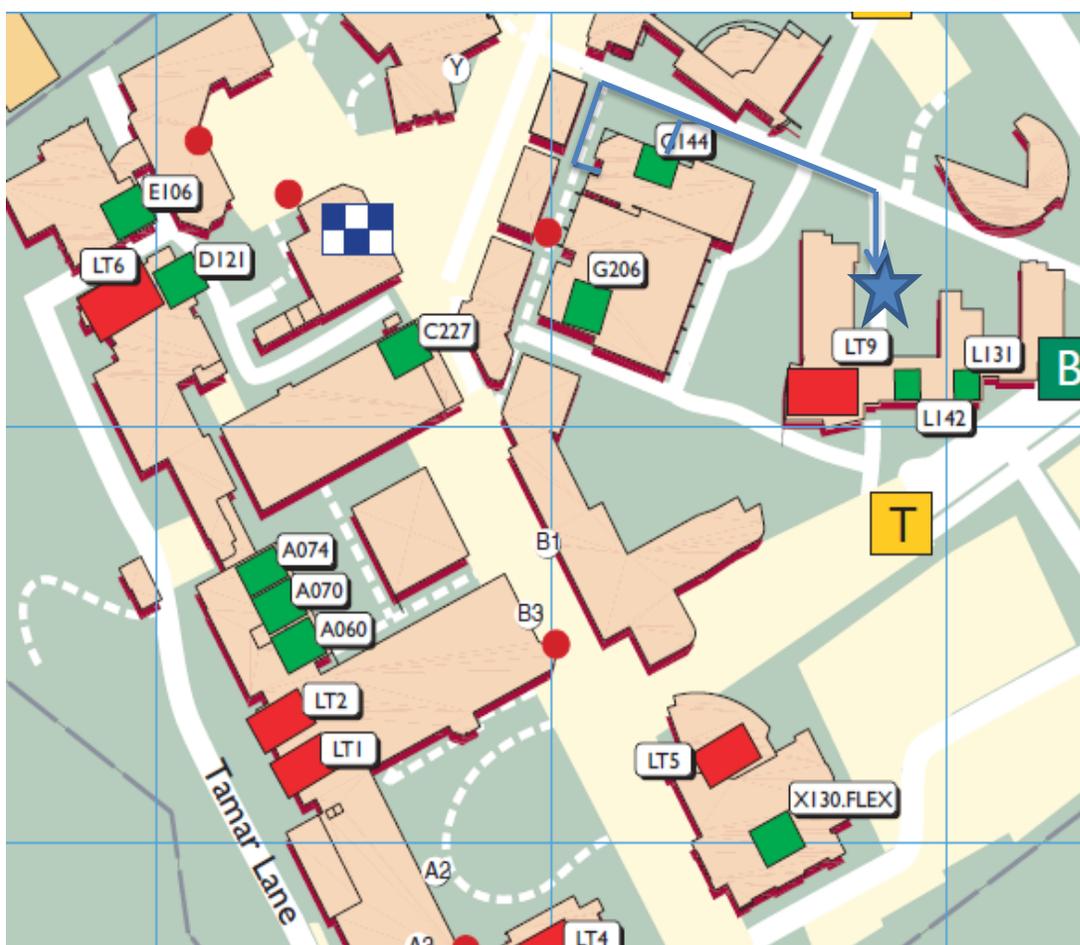
For people on level 1, unless otherwise instructed by the person supervising your class, or directing the evacuation, proceed from M Building to the Queen Elizabeth Walk – outside the coffee shop area (marked with a star).

For people on level 0, the usual evacuation point is in Tamar Lane, on the grass area behind M building (marked with a triangle).



G Building

For people on level 1, unless otherwise instructed by the person supervising your class, or directing the evacuation, proceed from G Building to the area behind the Faculty of Arts building (marked with a star).



APPENDIX 3

HEPATITIS B INFORMATION

Information Sheet on Hepatitis B

Infection with hepatitis B may occur as a result of inoculation or mucosal contact with blood or body fluids of an individual with active hepatitis B infection. In adults, the infection frequently causes acute symptomatic hepatitis from which the patient usually recovers, but around 2-4% of those adults infected go on to become chronic carriers with increased risk of serious complications.

The risk to health care workers depends on the rate of active hepatitis B in the population that provide the body fluids that you may be exposed to, the degree to which you are exposed to the body fluids, and the thoroughness with which precautions to avoid dangerous contact with blood and body fluids are practised.

Within your course of study for the Bachelor of Biomedical Science the risk of exposure to hepatitis B is minimized. You will be instructed on how to handle blood and body fluids safely, and in most cases the blood and body fluid samples come from sources that are negative for the hepatitis B virus, or the samples are treated to become non infectious. However, the risk cannot be totally eliminated, and when you go on professional placement in the final year of the course, you will be handling real specimens.

Fortunately, infection with hepatitis B can be prevented by vaccination. The National Health and Medical Research Council (NH&MRC) has investigated the hepatitis vaccine and has concluded that it is “very safe”, and has actually endorsed the routine vaccination of all Australian infants against hepatitis B. Two recombinant hepatitis B vaccines have been approved for use in Australia. They are both non infectious subunit vaccines, and in both, the active constituents are derived from genetically engineered yeast cells and NOT from human blood products. The vaccination consists of three doses, with an interval of 1-2 months between the first and second, and an interval of 6 months between the first and third. About 80% of people who receive the full vaccination course develop immunity although some need a fourth dose, and a very small number do not develop immunity at all. This is the reason that a post vaccination blood test to check for immunity to hepatitis B is important.

Hepatitis B Immunisation Policy

The National Health and Medical Research Council (NH&MRC) recommends that all health professional students be vaccinated against infections that they may encounter during their studies. In this context, the School of Human Life Science strongly recommends that students enrolled or intending to enrol in the **Bachelor of Biomedical Science** be vaccinated against hepatitis B. The need for students in the **Bachelor of Health Science** to be vaccinated against hepatitis B will vary depending on the specific units being studied and advice should be sought from an appropriate person from the School. Students in the Bachelor of **Health Science/Bachelor of Medical Radiation Science (Medical Imaging)** are required by Charles Sturt University to satisfy the Occupational Screening and Vaccination against infectious diseases requirements stipulated by the NSW Health Department.

Vaccinations required include Diphtheria, Tetanus, Pertussis, Hepatitis B, Influenza, Measles, Mumps, Rubella, Meningococcal, Polio, Pneumococcal, Varicella and Mantoux skin test (Tuberculin). Medical Imaging students need to collect an Adult Vaccination Record Card from the School of Human Life Sciences. You will need to contact your GP to record evidence of vaccination history and to ensure that your vaccination schedule is up to date. You will be required to supply the verified vaccination record card when you commence study at CSU. Vaccination for Bachelor of Biomedical and Bachelor of Health Science students is not compulsory, but when considering whether or not to be vaccinated, you should be aware that a number of health care agencies within the state are developing policies that may require staff, or students on work experience to provide evidence of hepatitis B vaccination prior to working in the agency.

The hepatitis B vaccination can be arranged through your general practitioner, and consists of three doses of vaccine over a period of six months. The NH&MRC recommends that those people at occupational risk also have a blood test three months after the last vaccination to check for immunity.

Some information on Hepatitis B is provided on the accompanying information sheet, and further advice is available from the staff of the School of Human Life Sciences should you require it. Should you choose to be vaccinated against hepatitis B, it may be useful to have your general practitioner fill out a Record of Vaccination so that you can retain evidence of your vaccination status in case you require it in the future (Record of Vaccination forms available from the School

APPENDIX 4

University of Tasmania

Launceston Region

Evacuation Procedure for Staff & Students



Emergency

Ring Campus Security (6324) 3336, if you need assistance



Evacuation



On hearing fire alarm sound or being instructed to evacuate the building (or if it becomes necessary to evacuate):

- **CALMLY LEAVE VIA THE NEAREST SAFE EXIT AND FOLLOW THE EXIT SIGNS OUT OF THE BUILDING. ASSIST PERSONS WITH DISABILITIES.**
- **DO NOT USE LIFT**
- **MOVE WELL AWAY FROM THE BUILDING UNLESS OTHERWISE INSTRUCTED. MOVE TO THE DESIGNATED ASSEMBLY AREA.**



Fire

- **Remove yourself and others from the immediate area. Assist persons with disabilities.**
- **Notify Building Warden, press break glass alarm, ring Campus Emergency Number (6324) 3336**
- **Confine by closing windows and doors (if possible)**
- **Evacuate - use all available safe exits. Extinguish fire only if appropriately trained and it is safe to do so.**