Bishop's University Safety Policy

1.03 Laboratory Health and Safety Procedure

Approved Date: September 13, 2010
Revised: September 13, 2010
Prepared by: Health and Safety Committee

1. Preamble

Bishop's University has a vital interest in preventing accidents and injuries as the security and safety of all our constituencies depends on it.

In the field of health & safety, success depends on a full and harmonious participation between employer and employee. At Bishop's University, health and Safety is a responsibility that is shared amongst all. Thus, to ensure an excellent quality of life for its employees and all persons who work or study here, Bishop's University states in this procedure its desire to eliminate at its source any threat to the safety and physical integrity of its community.

This manual is intended to provide **basic** rules for safe practices in a laboratory. Individual Department *Chairs*, professors and technicians must identify and supplement this manual with safe procedures and training specific to the needs of their laboratory safety programs when the safety subject is not adequately covered by this manual.

In all cases, all of us are ultimately responsible for teaching safe work practices and we must all insist upon the use of such proper procedures to eliminate unnecessary hazards.

We must all act with a level of judgement, care, caution, determination, and activity that a person would reasonably be expected to practice.

Since this manual will be periodically revised, readers are asked to convey to the *Joint Health and Safety* committee their comments on its contents, suggestions of items to be included, or omissions or errors.

Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

2. Key Contacts

○ **BUILDINGS AND GROUNDS**		
Director	B&G 05	2549
Administrative Assistant	B&G 02	2650
B&G Foreman	B&G 06	2230
Cleaning	B&G 04	2233
○ **DEPARTMENTAL CHAIRPERSONS**		
Biochemistry	JOH 329	2359
Biological Sciences	JOH 326	2460
Chemistry	JOH 218	2369
Physics	JOH 2	2372
Secretary		2355
○ **DEPARTMENTAL TECHNICIANS**		
Biology	JOH 321	2364
Chemistry	JOH 219	2368
○ **HUMAN RESOURCES**		
Director	MCG 106	2618
Officer	MCG 107	2643
○ **SECURITY**		
Director	DEW	2711
Assistant Director	DEW	2711
Customer Service	DEW	2711
Lead Hand	DEW	2711

3. Objectives

- Ensure a safe use of laboratories ;
- Ensure a good quality service to our students ;
- Protect all members of our community.

4. Definitions

4.1. Laboratory: Facility that provides controlled conditions in which practical learning, teaching, scientific research, experiments and measurement may be performed.

5. Scope

5.1. This policy shall apply to any member of Bishop's University according to the rights and obligations provided in the *Act respecting occupational health and safety* (AOHS) and in the *Act respecting industrial accident and occupational diseases* (AIAOD). The current policy equally applies to the student community.

6. General laboratory safety guidelines

6.1. GENERAL OBLIGATIONS

- Those who have known allergies have an obligation to inform their supervisor and / or laboratory technician.
- It is each and everyone's responsibility to :
  - Have undergone minimal training in health and safety before being allowed to work in a laboratory (i.e. graduate students, personnel and staff must follow W.H.M.I.S. training every three years) ;
  - Ensure the cleanliness of the premises ;
  - Ensure traffic areas are not obstructed ;
  - Report any problem that may occur.
- Prior to working in a laboratory, a new employee, student or professor must be trained in health and safety, this includes training in WHMIS. The nature of this training will be determined based on the work that has to be done.

6.2. AWARENESS – COMMUNICATION

- Be familiar with the locations of safety equipment such as fire extinguishers, M.S.D.S.'s, first aid kits, spill kits, emergency wash facilities, fire alarm pull stations, telephones, and emergency exits.

- Immediately report any unsafe conditions and accidents to your supervisor and/or technician.

6.3. PERSONAL PROTECTIVE EQUIPMENT

- Always refer to M.S.D.S. for the proper personal protective equipment.

6.3.1. GLOVES

- Gloves must be worn and disposed of as required by the Professor or lab technician.

- Always check to ensure the absence of cracks or small holes in gloves before each use. You must equally change gloves every half-hour.

- Gloves must be removed before leaving the laboratory. Do not touch your face during laboratory manipulations **.**

6.3.2. EYE PROTECTION & FACIAL PROTECTION

- When working with acid and strong bases, you must wear a face shield.

- Eye protection is mandatory in all laboratories where hazardous chemicals are used or stored, and anywhere near high-pressure, high vacuum equipment or when carrying out work that can generate dust, spray or other projectiles.

- Never wear contact lenses when working with hazardous chemicals. First, chemicals splashed into the eye are much more difficult to eradicate in the presence of a contact lens and can damage the eye more easily. Furthermore, vapours can superficially dissolve the lens which may cause it to adhere to the eye and cause irreversible damage.

6.3.3. CLOTHING

- Unless otherwise noted, a **lab coat is mandatory** in a laboratory. It must be buttoned at all times to provide the desired protection. Preferably, the coat is made of cotton and fitted with snap fasteners or releasable buttons, so that it can be easily removed in an emergency situation. The lab coats must be kept clean and be knee-length.

- Open-toed and high-heeled shoes must not be worn in the laboratory. Furthermore, shoes must be closed-back.

- Long hair must be tied back so that it cannot come into contact with hands, specimens, containers, or equipment.

- Wash hands with soap and water before leaving the work area.

6.4. PROPER USAGE OF LABORATORIES

- Backpacks and coats are not permitted in the laboratory. Since there is no space for storing winter clothes and/or large bags, you are required to bring only the necessary volumes and equipment for your laboratory work.

- Smoking, eating and drinking are not permitted in laboratories.

- It is forbidden to participate in a laboratory when under the influence of alcohol or drugs.

- You cannot store food or drinks in laboratory refrigerators. Any food used in laboratories can be stored in the refrigerator when placed in a different container.

- It is not permitted to run in laboratories, unless there is an emergency. (No playing around, goofing off, pranks or horseplay.)

- All cell phones or music players must be turned off before entering the laboratory. Their use is at the discretion of the supervisor.

- All laboratory doors MUST BE KEPT CLOSED AT ALL TIMES.

- NEVER OBSTRUCT exits or passageways or access to emergency equipment (i.e. eye wash stations, emergency showers, fire extinguishers, first aid kits and electrical panels).

6.5. CONDUCTING EXPERIMENTS

- Never perform unauthorized work, preparations or experiments.

- Consider safety issues before beginning work. Refer to Material Safety Data Sheets (MSDS) prior to using a product. Check all equipment for damage prior to setting up experimental apparatus.

- Experiments involving hazardous materials should be carried out in a vented fume hood.

- Advise fellow researchers and/or supervisors of experiments in progress.

- An experiment must never be left unattended if it represents a potentially hazardous situation.

- If necessary, post a suitable warning sign if a hazardous situation is present and left unattended. Inform the supervisor, technician or a member of security of your absence.

- Perform a safety check at the end of each experiment. Make sure that gas, water, electricity, vacuum lines, air and heaters have been turned off unless required.

6.6. PROPER HANDLING OF HAZARDOUS MATERIALS

- Always refer to M.S.D.S. and use the proper Personal Protective Equipment.

- Work with materials only when you know their flammability, reactivity, toxicity, and the emergency procedures associated with these materials.

- Label reagents and samples according to WHMIS legislation.

- Keep an updated inventory of all chemicals stored in your laboratory.

- Do not remove chemicals from the laboratory without updating your chemical inventory.

- Store chemicals according to chemical compatibilities rather than alphabetical order. (Please refer to Bishop's University Safety Procedure 1.05)

- Store chemicals in appropriate locations (eg. Flammable storage, acid storage cabinets, drip trays, secondary containment, etc.).

- At the end of the experiment, all material must be returned to its proper storage area.

- Do not leave reagent bottles, empty or full, on the floor or in the sink.

- Transport hazardous chemicals (eg. solvents) and chemical waste in approved bottle carriers or on a special waste cart.

- Mouth pipetting of any substance is prohibited in any laboratory. All reagents are suspect given the possibility of unforeseen mixtures or mislabelled tags.

- Clean up spills immediately if trained and able to do so. If the spill is too large to handle or if unsure what to do, **inform** the supervisor or technician. The latter will make a decision based on the extent of the spill.

6.7. LEAVING THE LABORATORY

- Hands must be washed after gloves have been removed, before leaving the laboratory and at any time after handling materials known or suspected to be contaminated.

- Work surfaces must be cleaned and decontaminated with a suitable disinfectant at the end of the day and after any spill or potentially hazardous material.

- Contaminated materials and equipment leaving the laboratory for servicing must be appropriately decontaminated and labeled or tagged-out as such.

7. Safety protocols

7.1. It is forbidden to work in laboratories without permission. Access to the laboratory is restricted to authorized individuals and as planned by the schedule. During regular classes, it is not allowed to start manipulations before receiving the signal from the lab supervisor. Unless otherwise specified, the laboratory room is accessible only 30 minutes before the start of a class. Visits outside scheduled hours must be in agreement with the laboratory supervisor or technician.

7.2. Working alone is considered an unsafe practice at any time. If, however, the nature of your work makes it unavoidable, measures should be taken to ensure that others are aware of what you are doing and have someone check in with you from time to time, either in person or by telephone.

- Ensure that you **always** carry a Bishop's University ID card.
- Before working alone off hours, **IT IS YOUR OBLIGATION TO ALERT** Security at extension 2711 **BEFORE** and **AFTER** working hours.
- Always check with your supervisor if specific procedures require a buddy system.

8. Laboratory Safety Equipment

8.1. SIGNAGE

- Laboratory room doors need to have proper signage (i.e. hazard identification, name and PHONE NUMBER of contact person, entry requirements).

8.2. FUME HOODS

- The fume hood is not a storage cabinet. Stored chemicals can interfere with efficient hood operation, and in the event of an accident or fire, every item in the hood may become involved.

- Be sure the hood is working properly.

- Only materials being used in an ongoing experiment should be kept in the fumehood. Cluttering of the hood will create air flow disturbances.

- Equipment should be placed as far back in the hood as practical and activities carried out at least 15 cm. (6 in.) from the front edge of the hood.

- Keep the sash clean, clear and closed when not attended.

- Clean all chemical residues from the hood chamber after each use.

- Electrical devices (unless certified explosion-proof) should be connected outside of the hood to avoid sparks which may ignite a flammable or explosive chemical.

8.3. LAMINAR FLOW HOODS

- Do not block the front intake or rear exhaust grille.

- Perform transfers of viable materials as deeply into the cabinet as possible**.**

- After activating cabinet's fan, wait 2-3 minutes before beginning work to allow sufficient time to purge airborne contaminants.

8.4. EMERGENCY SHOWERS

- Be familiar with the location and operation of the emergency shower nearest to your laboratory.

- The shower area must be readily accessible, and be kept clear of obstructions.

- Rinse the affected area for a minimum of 15 minutes with copious amounts of water.

- The use of emergency showers must be reported on an accident/incident form.

8.5. EYE WASH STATIONS

- Be familiar with the location and operation of the eye wash station nearest to your laboratory.
- The eye wash station must be readily accessible, and be kept clear of obstructions.
- Rinse the affected area for a minimum of 15 minutes with copious and gentle flow amounts of tepid water.
- The use of eye wash stations must be reported on an accident/incident form.

9. Fire safety

- Fire extinguishers are to be used to assist you in getting out safely or for fighting small fires. Do not attempt to fight a major fire on your own. Before any attempt of fighting a fire, **CALL SECURITY (ext. 2711 or 9-819-822-9711)**, whenever possible, in order to inform them of the situation. Never turn your back on a fire and always ensure access to an exit before fighting a fire.
- Quantities of any one flammable liquid kept on hand in the laboratory should never exceed 20 liters.
- Use CSA-approved flammable liquid storage cabinets. Keep doors of these cabinets closed and latched at all times. No other materials should be stored in these cabinets.
- Unless necessary for your work, keep flammable liquids away from heat, flame and direct sunlight. No welding or soldering should be performed in their vicinity.
- Static charges can build up in pipes or other apparatus through which organic liquids are flowing. Such equipment should be electrically grounded.
- In case flammable or explosive materials are spilled and/or being evaporated into the atmosphere, do not switch any electrical equipment on or off. In the case of an evacuation, turn off all equipment.
- All laboratories where flammable solvents are used must be equipped with an appropriate fire extinguisher.

10. Biological Safety

- All students working in a containment laboratory must be adequately trained in a bio-safety course.

11. Radiation safety

- All users must receive training prior to using radioactive materials.

11.1. X-RAY GENERATORS

- Study and follow all precautions specified by supplier of the instrument before using it.
- Warning signs must be displayed on or near the main power switch of the instrument and on the entry door to the location.

11.2. LASERS

- Study and follow all precautions specified by supplier of the instrument before using it.
- Home-made lasers must conform to all safety rules applied to similar commercial ones.
- Post warning signs in laser areas and on doors leading to those areas. Before experimenting with lasers, post proper signage in order to alert people beforehand.
- Always wear approved eye protection.
- If possible, keep laser beams at or below waist level.
- Never look directly at the beam or pump source.
- Use the image converter to look at the beam directly.
- Ensure that there are no unwanted reflective objects in or along the beam. Remove rings and watches.
- If possible, keep the room illumination level high to avoid pupil dilation.

11.3. UV RADIATION

- Study and follow all precautions specified by supplier of the instrument before using it.
- Post warning signs in areas where UV lamps are used.
- Always wear approved protective safety glasses with applicable UV filtering lenses.

- Do not work under UV light and protect all skin from UV radiation.
- Do not touch mercury lamps with oily fingers.
- UV sources should be operated within an enclosure and adequately cooled to prevent the mercury lamp from exploding and leaking hot mercury vapour.

11.4. MICROWAVES

- Do not attempt to operate microwave ovens with the door open.
- Do not tamper with or defeat safety interlocks.
- Ensure that seals around door are clean and undamaged.
- Loosen lids on containers in microwave ovens.
- Only qualified people should alter microwave ovens.
- Be aware of the dangers of super heated liquids.

11.5. HIGH MAGNETIC FIELDS

- People that have a pacemaker, prosthetic implant or artificial limb should consult their physician before entering the vicinity of a high field magnet.
- Areas surrounding NMR magnets must be well indicated with warning signs.
- Magnetically stored data (e.g. bank cards, computer disks, audio and video cassettes, etc.) must be kept away from high field magnets.

12. Electrical safety

- Report all defects/faults to your supervisor or technician.
- All electrical apparatus must be properly grounded.
- Never remove the ground pin of a 3-pronged plug.
- Do not overload an electrical circuit.
- Frayed wires and cords must not be used.
- Do not use electric wires as supports and do not pull on live wires.

- Ensure that all wires are dry before plugging into circuits.

- Electrical devices (unless certified explosion-proof) should be connected outside of fume hoods to avoid sparks which may ignite a flammable or explosive chemical.

- All electrical equipment immersed in liquids must have ground fault circuit interrupters.

- Circuit breaker panels within laboratories must be easily accessible (an area of one (1) meter around the circuit breaker must be left clear of any obstruction) and clearly marked.

- Minimize the permanent use of extension cords.

- Only qualified and trained people should repair or modify electrical or electronic equipment.

13. Glassware safety

- When handling glass rods or tubes :
  - Fire polish the ends.
  - Lubricate with water or glycerine when inserting through stopper.
  - Ensure stopper holes are properly sized
  - Insert carefully, with a slight twisting motion, keeping hands close together
  - Use gloves or a cloth towel to protect your hands.

- Use a dust pan and brush, not your hands, to pick up broken glass.

- Recycle any broken glass in the appropriate boxes. Do not dispose of glass in regular garbage.

14. Inspection of equipment, facilities and laboratories

14.1. Equipment

- A basic inspection must be performed before each use. A defective unit must not be used and must be reported immediately to the laboratory technician who will have it repaired by a qualified person or someone authorized by the manufacturer of the equipment.

- All inspections and all maintenance work for each electrical or mechanical device should be recorded in the maintenance manual of the device.

- Periodic inspections must be conducted according to the manufacturer's recommendations. These inspections should be recorded in the maintenance manual of the device.

14.2. Facilities and laboratories

- Facilities and laboratories are inspected at least once a year by the *Joint Health and Safety* committee (JHSC) or a person mandated by the JHSC. These inspections may take place without notice.

- An inspection report is sent to the JHSC and the Department Chair. If necessary, recommendations are submitted to the **Dean** for immediate corrective action. A notice to take action is then sent to the person responsible for the equipment or laboratory.

- If there is negligence to meet the recommendations of the JHSC, the case will be referred to the Vice-Principal Academic.

- When necessary, the JHSC consults and can make use of appropriate skilled resources, whether internal or external.

15. Inspection of protective equipment

- All inspections and all maintenance work for safety equipment, including first aid kits and eyewash stations must be noted in their maintenance manual.

- Inspection of safety equipment should be done regularly by the laboratory technician.

    - The eyewash stations are checked and adjusted (if necessary) at least once a week.

    - Safety glasses must be inspected before each use.

- Any defect in safety equipment should be reported to the supervisor or technician as soon as possible. This will allow repairs to be done in a timely fashion.

- Inspection of fire extinguishers is conducted twice a year by Security.

16. First aid

- Should an accident occur, always call Security first. They will contact the ambulance and can delegate people to your location immediately.

16.1. First Aid Kits

- The first aid kits are checked and resupplied after each use. These kits must be in accordance with the laws of Quebec. The technician responsible for the audit confirms each inspection in the maintenance manual.

- The material used for first aid kits should be immediately replaced. Anyone who uses material from a first aid kit should notify the technician in charge of the laboratory.

- A first aid kit should be used by someone who has first aid training, whenever possible.

- Always consult MSDS for first aid procedures.

- Should an accident occur, always call Security first. They will contact the ambulance and can delegate people to your location immediately.

- Fill in Accident forms, even if it only is a small cut.

16.2. Chemical burns to the eyes

- Rinse thoroughly with water for 15 minutes. Force your eyes to stay wide open with the fingers of one hand and rinse with eyewash. Always remember that early intervention is very important. A damaged cornea, even slightly, is susceptible to infection and should be treated accordingly.

- If necessary, ask to be transported to the nearest hospital. Don't forget to bring MSDS to the hospital. Such a measure could prevent many problems.

16.3. Chemical burns to the skin

- Rinse thoroughly with cold tap water for 10 minutes.

- Consult with a doctor if there are any skin lesions.

16.4. Thermal burn to the skin

- Rinse with cold water.

- Consult with a doctor if there are any deep skin lesions.

16.5. Tearing of the skin

- Immediately rinse thoroughly with cold tap water for at least 15 minutes.

- Disinfect the injured area with an antiseptic soap.
- Protect the injured area with gauze.
- If there is bleeding, rub down with gauze, if possible, elevate the affected area in order to reduce blood pressure.
- If the wound is deep or extensive, if there remains a foreign body or if there is a risk of infection or poisoning, ask to be taken to a hospital emergency room. Don't forget to bring MSDS to the hospital. Such a measure could prevent many problems.

17. Specific responsibilities of different parties

17.1. Faculty

- Make sure the technician is well informed of the intended use of the laboratory.
- Ensures the enforcement of rules in the laboratory with regards to education and research purposes.
- Ensures that the student is informed of the rules in regards to health and safety in laboratories. It must also ensure that each student has read the *Laboratory Health and Safety Procedure.*

17.2. Technician

- Prepares, gathers, organizes and sets out materials for laboratory sessions.
- Ensures that faculty, demonstrators and students know how to handle the apparatus, instruments, chemicals, radioactive products and dangerous organisms.
- Maintains and monitors MSDS Sheets and reagents.
- Takes care of equipment and laboratory maintenance.
- Indicates the location of safety devices and explains how to use them in the very first laboratory session.
- Must inform faculty, demonstrators and students of recycling procedures and disposal of chemical waste procedures.

- Disposal of chemicals is under the responsibilities of the Technician.

a) Arranges for a recognized chemical/hazardous waste disposal company to pick up any chemicals/materials to be disposed of.

b) Respects expiry dates and keeps track of the shelve life according to the MSDS sheets and disposes of chemicals/waste in a timely manner.

c) Dispose of any chemicals stored in damaged containers, any doubt about the container, lid or labelling must result in the disposal of the chemical(s) in question.

d) Opened chemicals must be disposed of within a 5 year period from the date they were opened except for inorganic salts which is at the discretion of the technician.

- Purchasing of chemicals is also a responsibility of the Technician and he/she must ensure that chemicals are purchased only in the quantities required and when needed.

- Reports any potentially hazardous step during handling.

- Ensures that the laboratories under his responsibility, when not used for teaching, are safe and that safety equipment is present and in good condition.

- Assist the professor in the enforcement of rules in the laboratory with regards to education and research purposes.

17.3. Demonstrator

- Ensures that rules of safety and security are met.

- Warns students when they are incorrectly or dangerously operating the apparatus. If the student were to repeat such a manoeuvre, a warning would then be sent to the professor or technician.

- Assist the professor in the enforcement of rules in the laboratory with regards to education and research purposes.

17.4. Student

- No student should perform any operation which they would consider to be hazardous.

- No student should perform any task in which they would put another student or faculty member in danger.

- Every student must be familiar with all university, departmental and unity safety instructions, whether written or oral, and to comply with such instructions when performing assigned duties.

18. Display in the laboratories

18.1. In each laboratory, the following must be displayed :

- Laboratory Health and Safety Policy (a website link is acceptable)
- Running inventory and log of the first aid kit
- WHMIS data sheets
- Faculty emergency contacts
- Signs indicating the location of fire extinguishers

19. Policy review

19.1. The *Laboratory Health and Safety Policy* must be reviewed annually.

Policy adopted by
JOINT HEALTH & SAFETY COMMITTEE
APRIL 2010