Safety Manual for Teaching Laboratories/Studios/Clinics

Building and Room Number(s):_____

Lab/Studio/Clinic Manager: _____

Contact Numbers_____

Street Address _____

Division of Environmental Health and Safety
4202 E. Fowler Ave, CRS 104
Tampa, FL 33620
(813) 974-4036
September 2012

The University Laboratory and Field Safety Committee coordinates and monitors laboratory and field safety functions and guidelines associated with research and teaching laboratories. In fulfilling the responsibilities the Committee developed the Safety Manual for Teaching Laboratories/Studios/Clinics. This manual provides safety standards for all individuals participating in teaching laboratories including but not limited to area managers, instructors, teaching assistants, course coordinator, staff, and students.

Safety Manual for Teaching Laboratories/Studios/Clinics

This manual applies to all instructional classroom environments where chemical, biological, or mechanical hazards are present. For the purposes of this manual, all instructional laboratories, studios, and clinics will be called teaching laboratories. All teaching laboratory occupants at the University of South Florida have a responsibility to apply safe practices to prevent injuries to themselves and others as well as decrease the potential for damage to equipment, buildings, and the environment.

Safety Training

All faculty, staff, and teaching assistants in teaching laboratories must attend the applicable training courses. These courses include:

- Safe Laboratory Practices Training: On an annual basis, Principal Investigators, research laboratory personnel and teaching assistants/instructors must attend a training session conducted by the Division of Environmental Health and Safety. This training session will inform them of best laboratory safety practices including personal protective equipment, mechanical control, chemical use and storage procedures, chemical waste procedures, and emergency incident procedures. EH&S will maintain a database of those individuals completing the training, and share that information with the Safety Supervisor.

- Teaching Laboratory Safety Training: The Teaching Assistants or Instructors of laboratory classes must provide a training session to their students during the first class meeting. They should use the guidelines located in Appendix I as the basis for their presentation. Students must sign the guidelines for each class in which they are enrolled. The signed guidelines are to be kept for one year within the Department, and be provided to EH&S upon request.

Instructors must ensure the teaching assistants are aware of any hazards that may be present while teaching the course. This includes chemical, biological, and mechanical hazards. Teaching assistants must have access to pertinent Material Safety Data Sheets and Safety Operating Protocols, and relate this information to their classes. See Appendix II for a template of Safety Operating Protocols. Chemical-specific Operating Protocols are available on the Environmental Health & Safety website.

Safe Laboratory Procedures

Safety equipment must be available in all instructional laboratories to prevent or reduce exposure to harmful materials. Teaching laboratories using hazardous chemicals, radiation, or biological materials, must have safety equipment such as a chemical fume hoods, biosafety cabinet, eyewash station, safety shower, fire extinguisher, first aid kit, and spill kit. The Environmental Health and Safety website provides information on contents for a spill kit.

- All teaching laboratory occupants must know where the safety equipment is located and how to use the safety equipment.

- Teaching laboratory occupants must wear appropriate Personal Protective Equipment such as lab coat, goggles, face shield, and gloves when working with chemicals. For additional guidelines on attire see Appendix I, Teaching Laboratory Guidelines

- Each laboratory must contain a waste container for broken glass.

- Sharps, such as syringes and needles, must be discarded in a red, certified sharps disposal box.

- If the laboratory procedure requires students to use UV light boxes, then the laboratory classroom must have UV rated face shield available for the procedure. If using a trans-illuminator the face shield must be rated for such use. Students must be informed of the dangers of viewing UV light, and be informed of the proper safety procedures.

- Students must be aware that refusal to comply with safety standards will result in dismissal from the classroom, and students may not be allowed to make-up missed work resulting from that dismissal.

- Each teaching laboratory must have a copy of this manual accessible to all occupants.

Emergencies

Injury Most injuries encountered in teaching laboratories will require minor first aid. These injuries could include bumps, scrapes, minor burns, and scalpel/glass cuts. These items for the most part can be handled with a first aid kit. The lab manager/instructor must be notified of all injuries, and an incident report (Appendix III) must be filed. If additional health care is needed direct the injured party to Student Health Services. Their number is (813) 974-2331.

If a student is more seriously injured additional medical care maybe needed. More serious injuries could be any of the following but not limited to – life in jeopardy, unconsciousness, substantial loss of blood, broken arm or leg, burns to a major portion of the body, or loss of eye sight. Administer first aid, contact the laboratory manager, and call 911.

Fire During the first day of class, the TA or Course Instructor must go over the following points with the class to prepare students for a fire or other emergency evacuation situation.

- Know the locations of fire exits in the building, and paths of egress. Know the location of fire extinguishers and alarm systems and know how to use them. Advise students to gather at a designated assembly location. Fire Safety Training and information is available through Environmental Health & Safety.

- In the event of a fire, leave the room, contact the laboratory manager, activate the building alarm, yell or shout "fire, fire, fire" and dial 911.

- For large fires do not attempt to fight or extinguish the fire, evacuate all rooms and close all doors to confine the fire and reduce oxygen. Do not lock the doors. Dial 911

- When a building evacuation alarm is sounded, an emergency situation exists. If it is safe to do so, turn off reactions including burners and hotplates. Walk quickly to the nearest exit and alert others to do the same.

- Assist the physically disabled in exiting the building. **Do not use the elevators during a fire.** Smoke is the greatest danger in a fire, so stay low near the floor where the air will be less toxic.

- Once outside, move to a clear area at least 500 feet away from the affected building. Keep streets, fire lanes, hydrants and walkways clear for emergency vehicles and crews. In an evacuation, report to your designated building assembly location. Stay there until an accurate headcount is taken. TA/Instructor is responsible for headcount

- Provide emergency crews with information as requested.

Chemical Spill If a small amount of chemical is spilled and the chemical is not acutely hazardous as defined by Environmental Protection Agency, then the teaching assistant can clean up the spill. All materials used to clean up the spill must be disposed of as hazardous waste. If the chemical spilled has toxic vapors, evacuate the laboratory and call Environmental Health and Safety, 974-4036. If the spill occurs on the weekend or in the evening, call 911. For more information on chemical spills read Appendix IV Hazardous Material Spills/Releases.

If the teaching laboratory uses biological samples, the teaching assistant will receive supplemental training in regards to emergency actions. Biosafety training is required of

all personnel working with recombinant DNA, infectious agents, select agents, and biological toxins or who works in a laboratory where these materials are used/stored. The assurance of proper training is the responsibility of the Course Instructor or owner of the facility in which the hazard is used. This biosafety training is available at the following website: http://www3.research.usf.edu/dric/biosafety/education.asp. Contact the teaching laboratory manager or Course Instructor.

Should an injury, damage to equipment, damage to the building, or damage to the environment occur, an incident report (Appendix III) must be filed with Environmental Health and Safety. No personal information should be included on the form.

Mechanical Safeguards

Many studios, clinics, and teaching labs require students to use mechanical equipment. The following section provides information to help alleviate injury due to mechanical equipment use. Injuries such as electric shock, burns, amputation, fractures, lacerations, and crushing can occur while operating equipment. These injuries can result from poorly designed equipment, poorly maintained equipment, using the equipment for unintended purposes, equipment not properly installed, inadequate safeguarding, and objects being discharged or thrown from the machine.

To prevent injuries machine operators should observe the following rules.

- Prior to using the equipment students must receive training from the instructor in the operation of the equipment including safety precautions.
- Everyone must follow manufacturer's specifications.
- Do not reach around, under, over or through guards into hazardous areas.
- Do not remove or defeat safety guards.
- Do not reach into equipment to remove stuck or jammed material.
- Do not bypass electrical safety procedures or equipment.
- Wear appropriate personal protective safety equipment.
- Never leave machines unattended with parts still moving unless machine designed for it.
- Do not wear loose clothing or jewelry around moving parts.
- Keep long hair back before working around moving parts.
- Immediately report any problems to the area manager/TA/instructor.
- If the equipment does not look correct or is malfunctioning. Do not use it. Contact the shop supervisor.

A list of guidelines is provided in Appendix V. Teaching Assistants must go over this list with students and have the students sign it. The document must be kept on record for one year, and must be available to Environmental Health & Safety for review.

Waste Management

The teaching laboratories may produce several types of waste including but not limited to chemical, and biological.

- Waste containers may be located in the individual laboratories or in a central storage location.
- All waste containers must be closed except when adding materials.
- Chemical waste containers must be labeled as hazardous waste, and be labeled with the contents.
- Metals of particular interest include heavy metals, mercury, and lead. If using these metals, check with the laboratory manager or course instructor for handling procedures. If a mercury-containing device is broken then call Environmental Health and Safety for clean-up. Biological waste containers must be labeled as biohazard, and use red biohazard waste bags. Sharps must be disposed of in red sharps containers. If there is a spill involving biological materials in a teaching lab please follow the Biological Spill Response (Appendix VI) in this document. You should print out a copy of this and post it in a visible place in the event that it is needed For more information on chemical and biological waste refer to the Environmental Health and Safety web site under hazardous waste documents.

Sharps/Bloodborne Pathogens

In some circumstances students participating in instructional laboratories or clinics may be exposed to bloodborne pathogens (BBP). For more information on bloodborne pathogens and training programs, please contact Environmental Health and Safety at 813-974-4036.

Students are expected to be safe in the learning environment. Therefore they should always be informed of the dangers involved and the precautions they need to take in order to remain safe in teaching laboratories. This manual provides a broad range of information to the students, but the instructors must be proactive in informing students of the hazards they will face in the individual laboratories.

Appendix I

Teaching Guidelines

Teaching Laboratory Safety Guidelines

The following Safety Guidelines are to be strictly adhered to in all teaching laboratories. These rules apply to students, teaching assistants, and instructors. The signed document should be turned into the TA, and the TA should give this document to the Teaching Lab Manager

- No food, drinks, or smoking in labs.
- Goggles are to be worn when any chemical, in any amount, is used including preservatives and stains. Goggles also need to be worn when there is the possibility of an object impacting the eye.
- Appropriate footwear must be worn at all times. The feet must be adequately covered (the foot must be totally covered up to the ankle). Therefore sandals, backless and open-toed shoes are not acceptable.
- Clothing appropriate for laboratory safety must be worn. Clothing (pants or skirt) must be worn which completely covers the entire leg from the waist to the ankle. Clothing (shirt, blouse, etc.) must be worn which completely covers the torso from the waist to the neck. Shoulders must be completely covered and sleeves must be worn that cover the arm from the shoulder to at least halfway to the elbow. Therefore, tank tops, halters, shorts, cutoffs, etc. are not acceptable. Some labs may require the use of a lab coat and/or gloves.
- Long hair should be tied back when using a Bunsen burner.
- Jewelry, particularly dangling necklaces or earrings with the potential to interfere with or be contaminated by an experiment should not be worn.
- Backpacks should be placed in the shelving units provided.

Safety Suggestions

- Materials are to be disposed of immediately after use and in the proper containers.
- All bottles, flasks etc. are to be labeled completely with full chemical names.
- Never leave an experiment unattended.
- Never leave a solution on a hot plate unattended.
- Hotplates that have been turned off, but are still hot, should have a warning note in front of them.

IF THERE IS A SERIOUS ACCIDENT, CALL 911 IMMEDIATELY. OTHERWISE CONTACT THE TEACHING LAB MANAGER.

I have read the safety guidelines listed above and understand that non-compliance will result in my dismissal from the laboratory until I do comply, and I will not be allowed to make-up missed work resulting from that dismissal.

Sign_____ Course #_____
Print Name_____ Section #_____

Appendix II

Safety Operating Protocols

Safety Operating Protocol

1. Process:
2. Hazardous Chemical\Class of Hazardous Chemical:
3. Personal Protective Equipment:
4. Engineering \ Ventilation Controls:
5. Special Handling Procedures Storage Requirements
6. Spill Containment\ Accident Procedures:
7. Waste Disposal
8. Special Precautions\ Animal Use:
9. Required Approvals:
10. Decontamination:
11. Designated Areas:

Appendix III

Laboratory/Studio and Field Incident Report

University of South Florida
Laboratory/Studio and Field Incident Report

This report is to be completed by the Lab Manager/Teaching Assistant/Instructor for any incident that occurs in any University of South Florida affiliated teaching or research laboratory/studio or field research project. An incident means any unplanned event within the scope of a procedure that causes, or has the potential to cause, an injury or illness and/or damage to equipment, buildings, plants or the natural environment. All incidents need to be reported whether they are near misses, serious injuries, or emergencies such as fires and chemical spills. A near miss is an event or situation that could have resulted in an accident, injury or illness, but did not, either by chance or through timely intervention. The completed form must be submitted to Environmental Health & Safety within 24 hours of the incident. This report will be used by the University Laboratory & Field Safety Committee and Environmental Health and Safety (EH&S) for training purposes only. This report provides information to take corrective action with laboratory procedures to prevent reoccurrences of similar incidents. As part of this report, EH&S will complete an incident investigation. **Due to medical privacy concerns, no personal identifying information of the person involved in the incident shall be entered or submitted with the form.**

Completed form must be submitted within 24 hours to EH&S; address CRS 104; phone (813)974-4036; fax (813)974-9346.
Due to medical privacy concerns, no personal identifying information of the person involved in the incident shall be entered or submitted with the form

Circle one: Teaching Lab/Studio Research Lab Field Activity Other

Date of Incident: _____ Time of Incident: _____ Location of Incident: _____
Preparer's name: _____ Phone: _____

(1) Incident Description

Describe the circumstances of the incident.

(2) Injury/Illness/Damage to Equipment, Building, Environment

Describe the extent of injuries and/or damage. Exactly where on the body did the injury occur?

(3) Actions Taken: Response/Treatment/Cleanup

a. Describe the nature of the emergency action taken.

b. Did the person seek medical treatment? Yes or no, explain.

c. Were emergency personnel contacted? Yes or No, EH&S, Fire, Hazmat, Police, Medical (Circle one or more choices)

(4) Corrective Action Taken

a. By Preparer.

b. By EH&S.

_____ _____
Date Reviewed by EH&S Name of Reviewer

Revised 11/10/2008

Appendix IV

Hazardous Material Spills/Releases

Hazardous Material Spills/Releases

For the purpose of this protocol the following definitions are provided:

- *Incidental Release(s)*: these are small isolated chemical spills that generally do not present the immediate potential to cause injury/illness or require evacuation other than from the immediate release area and can be contained and cleaned up by staff (Category I) or EH&S (Category II.)
- *Emergency Release*: an incident that involves a large quantity of one or more chemicals that have the potential to cause personnel injury/illness, and/or have the potential to cause environment damage (Category III.)

Category I: is any incidental spill that is contained and of minimal amount and/or low hazard (according to NIOSH pocket guide and/or MSDS, additional valid documentation, etc.) normally to be cleaned up by the work center. Workers are familiar with the material. A Category I Spill is a chemical release in which:

- Material presents no harm to occupants of room and/or work area (building, campus, etc.)
- Lab/work area is equipped with fully stocked spill kit.
- Employee(s) have the appropriate PPE available.
- Employee(s) have been instructed on proper spill cleanup (clean up procedures provided in a formal, documented setting either in the lab or work site or provided by EH&S.)
- Ventilation in the area is maintained.

Note: EH&S will respond to site if doubt exists about severity of the incident and evaluate.

Category II: is a large quantity and/or high hazard chemical release that EH&S staff can safely and effectively remediate. Category II Spills are chemical released in which:

- Material requires that special protective measures must be taken in order to abate.
- Ventilation may be compromised.
- Work area employees are unfamiliar with material.
- Work area is not equipped with necessary clean up tools (absorbent, neutralizer, etc.)
- Work area employees are unfamiliar with clean up procedures.
- Material is able to be detected by available instrumentation and EH&S staff member has been fully trained in its use.
- EH&S staff members are trained on spill cleanup procedures and are currently certified with 40-hr HAZWOPER and/or other necessary instruction as defined by department.
- Upon arrival EH&S may recommend or execute the following:
    - Activate the fire alarm for immediate evacuation of the building.
    - Call 911 for public emergency response services.
    - Recommend University Police notify neighboring buildings of chemical release.
    - Take other appropriate measures necessary to remediate the situation.

  Note: EH&S will respond to site, evaluate, advise, cleanup and/or advise and contact other campus department if necessary (when appropriate, staff members will don appropriate PPE).

Category III: is any chemical spill or release beyond the ability of EH&S to handle and will be cleaned up by an outside agency -- Tampa Fire Rescue- Hazardous Materials Response Team. Category III Spills are chemical releases in which:

- Material requires specialized equipment and/or instrumentation.
- EH&S staff member is unfamiliar or uncertain of material and/or is not fully trained and/or instructed to handle situation.
- Large quantity and/or high hazard (according to NIOSH pocket guide and/or MSDS, additional valid documentation, etc.)
- EH&S staff does not have access to appropriate PPE.
- Ventilation is compromised.
- Situation requires additional assistance from emergency response agencies.
- EH&S will request the following:
    - Activation of the fire alarm for immediate evacuation of the building.
    - Call 911 for public emergency response services.
    - Recommend University Police notify neighboring buildings of chemical release.
    - Take any other appropriate measure necessary to remediate the situation.

Appendix V

Teaching Laboratory Mechanical Safety Requirements

University of South Florida
Teaching Laboratory Mechanical Safety Guidelines

The following Safety Guidelines are to be strictly adhered to in all teaching laboratories. These rules apply to students, teaching assistants, and instructors.

General Rules for Safety

- Always wear safety glasses, goggles or safety shields designed for the type of work being done, when you or anyone is operating a machine.
- Get first aid immediately for ANY injury. Report all accidents and injuries to your instructor immediately.
- All machines must have effective and proper working guards if applicable.
- Replace guards immediately after any repairs
- Do not attempt to oil, clean, adjust or repair any machine while it is running.
- Do not leave a machine while it is running.
- Always see that work and cutting tools on any machine are clamped securely before starting.
- Keep the floor clear of metal chips and waste pieces. Put them in the container provided for scrap metal.
- Get help when handling long or heavy pieces of material.
- When working with another person, only one should operate the machine switches.
- Do not lean against the machines
- Concentrate on the work and machine at all times. Do not talk unnecessarily while operating a machine
- Do not talk unnecessarily to others while they are operating a machine.
- Be sure to have sufficient light to see clearly when doing any job.
- Never use compressed air for cleaning machinery.
- Never use compressed air to clean your clothes or any part of your body.

Rules concerning Clothes and Safety Equipment

- Appropriate footwear must be worn at all times. The feet must be adequately covered (the foot must be totally covered up to the ankle). Therefore sandals, backless and open-toed shoes are not acceptable.
- Clothing appropriate for the job must be worn. Wear short sleeves or sleeves rolled to the elbow. Wearing shorts or skirts is not allowed. Hot chips can cause cuts and burns.
- Do not wear jewelry, rings, watches, particularly dangling necklaces or earrings that could get caught in moving machinery.
- Keep hair tucked out of the way so it does not become tangled in moving parts.
- Always remove gloves before turning on or operating any machine.
- If material is rough or sharp and gloves must be worn, handle the material only when machine is turned off.

Rules Concerning Housekeeping

- Keep floors free of oil, grease or any other liquid. Clean up spilled liquids immediately.
- Aisles should be kept clear at all times to prevent tripping or other accidents. Backpacks should be placed in the designated area provided.
- Store materials in such a way that they cannot become tripping hazards. Return all excess material to the appropriate storage place.
- Place all metal waste in containers designated for recycling and disposal.

IF THERE IS A SERIOUS INCIDENT, CALL 911 IMMEDIATELY. OTHERWISE CONTACT THE TEACHING LAB MANAGER.

I have read the safety guidelines listed above and understand that non-compliance will result in my dismissal from the laboratory until I do comply, and I will not be allowed to make-up missed work resulting from that dismissal.

Sign_____ Course #_____

Print Name_____ Section #_____

Revised2/04/2009

Appendix VI

Biological Spill Response

Biological Spill Response

The guidelines are intended to assist the principal investigator, laboratory supervisor, and other responsible individuals who may be involved in the cleanup of biological spills. This guide outlines the basic procedures for dealing with some of the biological spills that may be encountered in a research laboratory. All lab personnel should refer to the specific spill response procedures before initiating their experiments.

Biosafety Level 1 (BL1) Spill

- Notify others in the area, to prevent contamination of additional personnel and environment.
- When BSL1 spills occur outside the lab (e.g. hallways, common rooms & corridors) report these BSL-1 spills to: (**1) Lab Director (2) USF Biosafety Officer 974-0954**
- Remove any contaminated clothing and wash exposed skin with soap and water.

Clean-up of BL1 Spill

- Wearing gloves and lab coat, cover spill with paper towels, pour disinfectant around the spill allowing it to mix with spilled material. Allow suitable contact time, at least 15 min.
- Pick up any pieces of broken glass with forceps and place in a sharps container.
- Discard all disposable materials used to clean up the spill into a biohazard bag.
- Wash hands with soap and water.

Biosafety Level 2 (BL2) Spill

- Notify others in the laboratory regarding the spill
- Close door, and post with a warning sign.
- Remove contaminated clothing, turning exposed areas inward, and place in a biohazard bag.
- Wash all exposed skin with soap and water.
- Inform Supervisor and/or **Lab director and USF Biosafety Officer (974-0954)**

Clean-up of BL2 Spill

- Allow aerosols to disperse and or settle for at least 30 minutes before reentering the laboratory (if spill outside cabinet). Assemble clean-up materials (disinfectant, paper towels, biohazard bags, and forceps).
- Put on protective clothing (lab coat, facemasks/face protection, utility gloves, and booties if necessary).
- Cover the area with disinfectant-soaked towels, and then carefully pour disinfectant around the spill. Avoid enlarging the contaminated area. Use more concentrated disinfectant as it is diluted by the spill. Allow at least a 20 minute contact time.
- Pick up any sharp objects with forceps and discard in a sharps container.
- Soak up the disinfectant and spill using mechanical means, such as an autoclavable broom and dustpan, since there may be sharps under the paper towels, and place the materials into a sharps container.
- Smaller pieces of glass may be collected with cotton or paper towels held with forceps. If no sharps were involved in the spill discard the materials into an autoclave bag.
- Wipe surrounding areas (where the spill may have splashed) with disinfectant.
- Spray the area with 10% household bleach solution and allow to air-dry (or wipe down with disinfectant-soaked towels after a 20-minute contact time).

- Place all contaminated paper towels and any contaminated protective clothing into a biohazard bag and autoclave.
- Wash hands and exposed skin areas with soap and water.