



UNIVERSITY OF SOUTH FLORIDA

Safety Manual for Teaching Laboratories/Studios/Shops

Building and Room Number(s): _____

Lab/Studio/Clinic Manager: _____

Contact Numbers _____

Street Address _____

Environmental Health and Safety
4202 E. Fowler Ave, OPM 100
Tampa, FL 33620
(813) 974-4036
September 2019

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/Shops. This manual provides safety standards for all individuals participating in teaching laboratories including but not limited to area managers, instructors, teaching assistants, course coordinators, staff, and students.

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Safety Manual for Teaching Laboratories/Studios/Shops

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

Safety Training

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

- **Laboratory and Research Safety Training:** All faculty, staff, and teaching assistants must attend a training session conducted by the Division of Environmental Health and Safety annually. This training session will inform them of best laboratory safety practices including personal protective equipment, engineering controls, 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.
- **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>.

Instructors must ensure the teaching assistants are aware of any hazards that may be present while teaching the course. This includes, but is not limited to, chemical, biological, and mechanical hazards. Teaching assistants must have access to pertinent Safety Data Sheets and Standard Operating Procedures (SOPs), and relate this information to their classes. Template SOPs are available to download from the Environmental Health & Safety website (www.usf.edu/ehs).

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 hood, biosafety cabinet, eyewash station, safety shower, fire extinguisher, first aid kit, and spill kit. The Environmental Health and Safety website (www.usf.edu/ehs) provides information on spill kit assembly.

- 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 designate a waste container for broken glass.
- Needles must always be discarded in a red sharps box and disposed of as biomedical waste. Non-infectious sharps can be placed in the broken glass box or other designated container.
- If the laboratory procedure requires students to use UV light boxes, then a UV-rated face shield must be available. 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 without opportunity to make-up missed work resulting from that dismissal.
- Written procedures must be created for all potentially hazardous activities. A Standard Operating Procedure Template can be found at <https://www.usf.edu/administrative-services/environmental-health-safety/programs-services/laboratory-safety/sops.aspx>

Emergency Response

In Case of Emergency:

Tampa: Call 911 or Direct Police Line, (813) 974-2628

St. Pete: Call 911 or Direct Police Line, (727) 873-4140

Sarasota: Call 911 or Direct Police Line, (941) 487-4210

Should an injury, damage to equipment, damage to the building, or damage to the environment occur, an incident report must be filed with Environmental Health and Safety. No personal information should be included on the form. It is also important to report near misses which have the potential to cause injury or damage. Report all incidents at <https://www.usf.edu/administrative-services/environmental-health-safety/reporting/index.aspx>

Emergency Response: Injury

Minor injuries encountered in teaching laboratories can be handled with a first aid kit. These injuries could include bumps, scrapes, minor burns, and scalpel/glass cuts. The lab manager/instructor must be notified of all injuries and an incident report must be filed. If additional treatment is needed direct the injured party to Student Health Services. For serious injuries including: 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 contact the emergency numbers above, administer first aid, and contact the laboratory manager.

Emergency Response: Fire

Faculty, students, and staff are not expected to fight fires. Only use a fire extinguisher if the fire is small and you are trained. Follow these emergency procedures.

- Yell out “FIRE FIRE FIRE!”
- Alert other building occupants by activating the fire alarm using the manual pull station.
- If it is safe to do so, turn off reactions including burners and hotplates.
- Assist the physically disabled in exiting the building. **Do not use the elevators during a fire.** Close doors behind you as you exit.
- TAs must collect their class and exit together. If anyone is unaccounted for, notify emergency responders.
- Once safely outside and 150 feet away from the building, contact the emergency numbers above and give as much information as possible to the emergency dispatcher. Keep streets, fire lanes, hydrants and walkways clear for emergency vehicles and crews.

During the first day of class, the TA or Course Instructor must review these fire emergency procedures for students. Additional fire safety training and information is available through Environmental Health & Safety (www.usf.edu/ehs).

Emergency Response: Chemical Spill

- Small spills may be cleaned up by the lab as long as personnel have proper supplies, knowledge, personal protective equipment (PPE), and are comfortable doing so.
 - Secure the area.
 - Consult the SDS of the spilled chemical and put on proper PPE
 - Pick up broken glass using tongs and place in a waste bucket.
 - Spread absorbent material around the spill site and over the liquid's surface and wait 15 minutes.
 - Collect wet absorbent and transfer to the waste bucket or bag using dustpan and brush.
 - Dispose of all spill cleanup materials and used PPE as hazardous waste.
 - If the spill is large, involves extremely hazardous chemicals, ventilation, PPE, and/or knowledge is inadequate, or if the spill enters a drain, soil or body of water call Environmental Health and Safety at 974-4036. If a mercury-containing device is broken, evacuate and secure the area and call Environmental Health and Safety. If the spill occurs on the weekend or in the evening contact the emergency numbers on page five.

For more information on chemical spills read [Appendix IV: Hazardous Material Spills/Releases](#).

Emergency Response: Biological Material Spill

- Small spills may be cleaned up by the lab as long as personnel have proper supplies, knowledge, personal protective equipment (PPE), and are comfortable doing so.
 - Secure the area.
 - Put on proper PPE.
 - Pick up broken glass using tongs and place in a red sharps container.
 - Cover the spill site with absorbent material, pour a freshly made 10% bleach solution over it, and wait 15 minutes.
 - Collect wet absorbent and transfer to the waste bag using dustpan and brush.
 - Dispose of all spill cleanup materials and used PPE as biomedical waste.

For more information on biological material spills read [Appendix VI: Biological Spill Response](#).

Safe Studio/Shop Procedures

Many studios, shops, and teaching labs require students to use mechanical equipment. The following section provides information to help reduce the risk of 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 tied back when working around moving parts.
- Immediately report any problems to the area manager/TA/instructor.
- If the equipment is broken, do not use it. Contact the shop supervisor.

A list of guidelines is provided in [Appendix III](#). 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. For more information refer to the USF Shop Safety Guide available on the EH&S website.

Waste Management Procedures

Teaching laboratories may produce chemical and biological waste. No waste must ever be put down the drain or in the trash.

- Waste containers must be located at or near the point of generation.
- All waste containers must be closed except when adding materials.
- Chemical waste containers must be labeled with the words "Hazardous Waste" the contents.
- Biomedical waste containers must display the words "Biomedical Waste" and the international biomedical waste symbol. Only red biohazard waste bags are used.
- All needles and biomedical waste sharps must be disposed of in red plastic sharps containers. For more information on chemical and biological waste refer to the Environmental Health and Safety web site (www.usf.edu/ehs).

Sharps/Bloodborne Pathogens

In some circumstances students participating in instructional laboratories 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.

Summary

Students are expected to be safe in the learning environment. Therefore they need to be informed of the dangers involved and the precautions they need to take in order to remain safe in teaching laboratories. This manual provides general information, but lab supervisors must provide lab-specific information about hazards present their laboratories.

Appendix I: Teaching Laboratory 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 Teaching Lab Manager must maintain records of all the signed documents.

- No food, drinks, smoking, chewing gum, or applying cosmetics and contact lenses in labs, studios, or shops.
- Splash goggles are to be worn when there is a risk of chemical or biological material splashing. Eye protection needs to be worn when there is the possibility of an object impacting the eye.
- Footwear that covers the entire foot must be worn at all times. Therefore sandals, flip-flops, ballet-flats, 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 lab courses may require the use of a lab coat/apron and/or gloves.
- Long hair should be tied back.
- Long, dangling jewelry, such as 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 and not in the walkway.

Safety Suggestions

- Waste materials are to be disposed of immediately after use in the designated containers.
- All containers are to be labeled completely with full chemical names and a hazard description. For example: "6M Hydrochloric Acid: CORROSIVE"
- 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.
- Working alone is not recommended.

**IF THERE IS A SERIOUS ACCIDENT, CALL 911 OR UNIVERSITY POLICE IMMEDIATELY.
NOTIFY 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 # _____

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Appendix II: Hazardous Material Spills/Releases

Hazardous Material Spills/Releases

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

- ***Incidental Release:*** a small isolated chemical spill without the potential to cause significant injury/illness and/or environmental damage. It does not 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 significant personnel injury/illness and/or environmental damage.

Category I: An incidental release of a small quantity and/or low hazard chemical (according to NIOSH pocket guide and/or SDS) that may be cleaned up by lab personnel who are familiar with the material.

A Category I Release is a chemical release in which:

- Material presents no significant threat of harm to personnel and/or environment.
- Lab personnel are familiar with the material.
- Lab is equipped with fully stocked spill kit.
- Lab personnel have the appropriate PPE available.
- Lab personnel 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 is adequate.

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

Category II: An incidental release of a large quantity and/or high hazard chemical that EH&S staff can safely and effectively remediate. A Category II Release is a chemical release in which:

- Material presents a significant threat of harm to personnel and/or environment.
- Lab personnel are unfamiliar with the material.
- Lab is not equipped with necessary clean up tools (absorbent, neutralizer, etc.)
- Ventilation is inadequate.
- Material can 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.
- 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 that University Police notify neighboring buildings of chemical release.
 - Take other appropriate measures necessary to remediate the situation.

Note: EH&S will evaluate the release, provide advice and assistance in cleanup, and/or coordinate with other campus departments if necessary (when appropriate, staff members will don appropriate PPE).

Category III: An Emergency Release of a large quantity and/or high hazard chemical (according to NIOSH pocket guide and/or SDS) that EH&S staff cannot safely and effectively remediate. An outside public agency such as Tampa Fire Rescue- Hazardous Materials Response Team will be contacted. A Category III Release is a chemical release in which:

- Remediation requires specialized equipment and/or instrumentation.
- EH&S staff member is unfamiliar with the material and/or is not trained in the clean-up procedure.
- EH&S staff does not have access to appropriate PPE and/or clean-up tools.
- Ventilation is inadequate.
- EH&S will execute the following:
 - Activation of the fire alarm for immediate evacuation of the building.
 - Call 911 for public emergency response services.
 - Recommend that University Police notify neighboring buildings of chemical release.
 - Take other appropriate measure necessary to remediate the situation.

Appendix III: Studio/Shop Safety

University of South Florida

Teaching Laboratory Studio/Shop 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 safety guards if applicable.
- Safety guards must never be removed
- 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 labeled 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 tied back 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 # _____

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Appendix IV: 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 starting.

Biosafety Level 1 (BSL1) Spill

- Notify others and secure the area.
- 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 974-5110**
- Remove any contaminated clothing and wash exposed skin with soap and water.

Clean-up of BSL1 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 (BSL2) Spill

- Notify others and secure the area.
- 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 (974-5110)**

Clean-up of BSL2 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.