

# **SAFETY HANDBOOK**

## **DEPARTMENT of INDUSTRIAL AND ENGINEERING TECHNOLOGY**

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# INTRODUCTION

Safety Handbook of the Department of Industrial & Engineering Technology

The purpose of this manual is to document proper safety procedures for the Department of Industrial & Engineering Technology.

Both the faculty and administration are responsible for promoting and administering the safety program in all lecture and laboratory classes taught under their supervision. Every researcher is responsible for the safety of their laboratories and the safety of all persons working under their direction. Each individual is responsible for performing his/her job safely. Each individual should always be diligent in their efforts to have safety hazards corrected as soon as possible. It is the instructor's responsibility to know the proper action to take if an accident occurs in their lecture or laboratory class, to be familiar with the operation and use of all safety equipment in the department, to know the proper evacuation route from each of the classrooms used by them, and to be aware of the proper emergency procedures established for the Department, the College, and the University.

Every laboratory instructor/supervisor should set a good example by observing all rules and recommendations and by being an active safety advocate.

The instructor should:

1. Discuss safety procedures and policies with the students.
2. Be alert for unsafe conditions.
3. Inspect often and intelligently.
4. Take effective corrective action promptly.
5. Maintain discipline and enforce safety rules.
6. Assume responsibility for visitors and require that they follow the same rules as students.
7. Carefully review all projects for possible safety problems before the projects are assigned to students.
8. At the beginning of class point out to the students any possible hazards that may be encountered and, in the event that an accident occurs, indicate the proper course of action that must be taken. The immediate and proper use of the eye wash or safety shower should be emphasized.
9. The instructor should in general be present at all times in research labs except as follows:
  - i. The instructor must leave in order to tend to an emergency (and in that case a responsible stand in should be appointed if at all possible)
  - ii. The class utilizes several different lab locations (for example Material Testing Laboratory)

This manual is not intended to supersede the Southeastern Louisiana University Safety Manual but is intended to be a supplement to be used in conjunction with that manual.

## EMERGENCY RESPONSE NUMBERS

### IF IN QUESTION...CALL UNIVERSITY POLICE AT 985-549 2222

IN CASE OF.....	CALL.....	AT.....
Fire	University Police	2222
Medical Emergency	University Police	2222
Injury	University Police	2222
Question concerning minor injury	University Health Center	2241
Minor Chemical Spill	Laboratory Coordinator	3310
Major Chemical Spill	University Police & Environmental Health and Safety & Laboratory Coordinator	2222 & 2157 & 3310
Missing Lab Materials	Laboratory Coordinator	3310
Safety Question	Environmental Health and Safety	2157
Emergency Chemical Information	CHEMTREC	9-1-800-424-9300
Emergency Hazardous Substance	LA State Police	9-1-504-925-6595
Equipment Malfunction	Laboratory Coordinator	3310
Major Maintenance	Physical Plant	3333
Other Issues	Industrial and Engineering Technology Dept. Secretary	2189
SELU Information		2000

A copy of this list should be posted by each laboratory phone.

## RESPONSE TO ACCIDENTS

IN CASE OF AN ACCIDENT WITH INJURY - CALL UNIVERSITY  
POLICE –985-549-2222

If you need emergency assistance call University Police at 985 549-2222

Phones are located in each office. Be sure to tell police your exact location and the nature

of the incident.

An Accident Report **MUST** be filled out for each accident involving injury to student or faculty member. The Accident Report form may be found in Appendix I of this document and in the form drawer of the Departmental office.

If a student refuses additional medical care (from Student Health Center, University Police, or local walk-in clinic) be sure student signs this fact on Accident Report.

### First Aid Procedures

Some minor first aid may be given while awaiting arrival of help. First Aid materials administered should be limited to soap, water, paper towels and standard band-aids. A summary of appropriate temporary aid follows.

**Moving Victim-** Never move or lift accident victims unless they are in danger of further injury. If they must be moved from a hazardous area, grasp their feet and drag them away while protecting the head from injury. Calm and comfort the victim and do not alarm them.

**Acid and Alkali Burns -** Flush the affected area with water and remove or cut away clothing. This may be done in the sinks or showers. There are emergency showers and eyewash stations in every laboratory. If substantial amount of acid has gotten on clothes, have individual enter shower and remove all contaminated clothing.

**Acid and Alkali Splashes to the Eye -** First aid for splashes to the eye should begin as quickly as possible by thoroughly washing the face, eyelids, and eye. Eyewash stations are available in all of the laboratories. The eye should be thoroughly flushed for an additional 15 minutes. The eye lids must be held open during this time. **DO NOT RUB THE EYE.** Only plain water should be used.

**Swallowed Poisons -** Dilute strong acids and alkalis by quickly administering large amounts of water. But, **NEVER** give liquids to an unconscious person. If strong acids, strong alkalis, or petroleum products are known to have been swallowed, do not induce vomiting.

**Cuts-** If there is a possibility of contamination, wash affected area with copious amounts of soap and water. If bleeding, follow instructions below.

**Bleeding -** Have the student apply pressure directly to the wound. This may be done with a clean paper towel or directly with a hand. Do **NOT** apply a tourniquet. Try to insure that the blood does not contact anyone else.

**Fractures -** Do **NOT** move the victim unless absolutely necessary.

**Thermal Burns -** Immerse burn in gently running cool water. If burn is severe do **NOT** attempt to remove clothing. If burn is very severe, be careful about applying ice or water over burn, as this may intensify shock reaction.

**Electrical Shocks -** Remove the source of shock as soon as possible either by (a) shutting off the source of power or (b) using a non-conductive object (wood or dry cloth) to separate the victim from the source.

Note: The instructor should escort the injured student to the eye wash or safety shower to ensure that proper flushing is initiated.

## **SAFETY TRAINING**

All faculty, staff, research students, and solutions workers will participate in an ongoing program of principle-based safety training. The department head will document all training.

## **SAFETY INSPECTIONS**

Quarterly building inspections will be conducted by the building coordinator or his designee. For Computer Science and Technology Building, the building coordinator is the Industrial and Engineering Technology Department Head. The Lab Coordinator is designated to conduct safety inspections in accordance with the guidelines set forth by the EHS Department at Southeastern Louisiana University.

The Lab Coordinator or as assigned by him will conduct an inspection and test of all eyewash stations and showers as per Appendix VI then report in quarterly building inspection to Safety department.

Whenever a faculty member leaves the department on a permanent basis, the building coordinator or designee shall conduct an inspection of the laboratory spaces previously occupied by that person to ensure that there are no hazardous conditions (wastes, chemicals etc.) that need to be addressed before that person vacates the premises. A completed report will be delivered to the department head for appropriate action.

## **CORRECTION OF UNSAFE CONDITIONS**

The purpose of conducting safety inspections is to identify potential unsafe practices or conditions. The designated person needs to be notified of all unsafe conditions. It is the designated person's responsibility to ensure that proper corrective action is taken in a timely manner to remediate all documented hazardous conditions. This may mean submitting a service request, contacting the laboratory coordinator, asking another faculty member to do so, or taking care of the matter personally. If correcting the safety infraction is outside of the designated person's ability, then inform the Department Head of the situation and suggested corrected action immediately.

**DO NOT WAIT FOR A SAFETY REPORT!** If you see an unsafe condition, immediately correct it or report it to the Lab Coordinator or the Department Head.

## **SAFETY POLICY FOR LABORATORY WORK**

Different laboratories have slightly different safety policies dependent upon the commonly encountered hazards associated with each particular laboratory. There are separate laboratory safety policies and guidelines for each individual laboratory. These



laboratory Policy Sheets may be found in this handbook. It is necessary to review in detail each laboratory policy sheet the first day of each new lab class.

## **SAFETY DOCUMENTATION PRIOR TO LABORATORY WORK**

Before each student may begin a new laboratory class they must successfully complete a safety test documenting their knowledge and understanding of the Laboratory Policy for that class. Different classes have slightly different safety tests which focus on the particular safety aspects of that lab. After the test has been taken the instructor will review the correct answers with students before the test is collected.

## **BUILDING EVACUATION**

At the beginning of each semester the instructor shall inform the students in each of their classes the proper evacuation route from that classroom. In case of an emergency evacuation, the instructor shall make certain that all of their students leave the by the most direct safe route and meet in the grassy area within Railroad Street Park. There is an evacuation route posted adjacent to all common room exit doors. If the usual evacuation route is blocked, then the students shall exit the building by the most direct and safe alternate route. The evacuation routes for Computer Science and Technology Building (CSTB) are listed in Appendix I.

After an emergency occurs which requires the evacuation of the building, the Faculty and Staff of the Industrial and Engineering Department and Computer Science Department are to meet the Building Coordinator in the grassy area within Railroad Street Park. This Requirement is to be met so that emergency personal do not have to enter the building looking for you or your students. It is the instructor's responsibility to ensure that all of their students have evacuated the building. If you suspect someone may be trapped inside the building, notify firefighters on the scene. Do not leave Railroad Street Park until a responsible party has been made aware of your successful evacuation of the building.

Do not reenter building until directed by police or fire department personnel.

## **FIRE ALARM PROCEDURE**

The safety of the students, staff, and faculty in a fire situation is of the utmost importance. The hallways in for Computer Science and Technology Building CSTB are equipped with internal fire and smoke sensors so that when fire or smoke is detected the alarm will sound. The laboratories ARE NOT equipped with automatic fire or smoke sensors. If a fire occurs in a lab, and help is needed, it must be summoned (by pulling a fire alarm pull station). When a fire alarm is activated, lights will flash and a loud high-pitched alarm will sound. The alarm is monitored and University Police will be automatically contacted. If a fire alarm results, it is also beneficial to call the University Police (2222) to update them on specific hazards and current status. When a fire alarm sounds, the building must be evacuated. The building may not be reentered until an "All Clear" is given by fire and police personnel. All faculty, staff, and students should meet in the grassy area of Railroad Street Park and be prepared to verify that all of their students are accounted for.

## EMERGENCY RESPONSE TO LABORATORY FIRE

As soon as a fire is noticed do the following.

1. Alert other people in the laboratory or immediate area by calling "Fire".
2. If the fire is large, spreading, in close proximity to high volume of flammable or explosive items, or is threatening to block your exit,
  1. Immediately evacuate the room. Do not pause to collect personal items. Pull the (fire) doors closed behind you.
  2. Pull the fire alarm.
  3. Leave the building by appropriate route. Use stairs not elevators.
  4. Instructors should also be responsible for ensuring handicapped people are safely guided out of the building. Elevators will not be available and wheelchair students will need to go to the safe landing in the stairwells.
  5. Proceed to Railroad Street Park. (Students must check in with instructors at Railroad Street Park).
  6. Notify firefighters on the scene if you suspect someone may be trapped inside the building.
  7. Do not reenter building until directed by police or fire department personnel.
3. If the fire is small, contained, not blocking your exit, and you feel comfortable doing so, you may choose to fight the fire. Otherwise evacuate following the above steps.

To fight a fire, do the following....

- a. If the fire is small and self-contained, you may be able to extinguish it by covering it with a nonflammable item such as a beaker or watch glass.
- b. Very small contained fires (such as small amount of material in a test tube or beaker) which are not in close proximity to other flammables may be allowed to burn themselves out. This is particularly useful when isolated within a hood.
- c. If the fire is electric in nature, and you can safely do so, unplug the equipment.
- d. Use a nearby fire extinguisher to control and extinguish the fire.

When using a fire extinguisher, remember the word PASS:

Pull the pin  
Aim the nozzle at the base of the fire  
Squeeze the handle to release the extinguishing agent  
Sweep the base of the fire from side to side

- e. If the fire is not extinguished after one extinguisher, then evacuate the building using above steps.

## **FIRE OUTSIDE OF THE BUILDING**

Call University Police (2222) for an automobile or trash fire.

## **BOMB THREAT**

In the event that a bomb threat is received, notify the University Police (2222) immediately. The decision to evacuate a building due to a bomb threat shall be made by the person deemed responsible for the building and the Director of University Police.

If a decision is made to evacuate the building, occupants in each office, classroom, and laboratory in the building will be notified by the University Police or other personnel to evacuate the building and report to the grassy area of Railroad Street Park for further instructions. Instructors should be directed to bring the class in a group and recheck the roll at the final destination.

All persons not connected with a search of the building will remain outside of the building until it has been declared safe for occupancy by University Police.

## **GENERAL EMERGENCY RESPONSE PROCEDURES**

Since the hoods are interlocked with the air handling units, the hoods in the lab will fail when the air handling unit stops. If the hoods stop many experiments may no longer be done safely and a hazardous (potentially lethal) environment may develop.

In the event of hood stoppage, a chemical spill, gas leak, fire in a laboratory, classroom or other building area, the Instructor, Department Head, or Laboratory Coordinator shall decide as to whether or not the emergency can be abated locally, or whether evacuation of the building is required, and if outside assistance is needed.

If the building must be evacuated, follow the below procedures.

1. Alert other people in the immediate area.
2. Immediately evacuate the room. Do not pause to collect personal items. Pull all doors closed behind you.
3. Pull the fire alarm.
4. Leave the building by appropriate route. Use stairs not elevators.
5. Proceed to Railroad Street Park. (Students must check in with instructors at Railroad Street Park).
6. Call University Police (2222) and advise them of the problem.
  - a. Your name
  - b. Exact location of the Emergency

- c. Cause of the emergency
  - d. List materials that have been spilled or may be released.
  - e. Actions taken to ameliorate the emergency.
7. Notify firefighters on the scene if you suspect someone may be trapped inside the building.
  8. Do not reenter building until directed by police or fire department personnel.

## **ELEVATORS**

There are two elevators in CSTB. The freight elevator is located at the North end of the main Hall. The passenger elevator is located at the South East corner of for Computer Science and Technology Building CSTB. Never use the passenger elevator for the movement of hazardous objects such as gas cylinders or hazardous chemicals. Never ride in the freight elevator. Never use the elevator if there is a fire in the building.

## **SAFETY DATA SHEETS**

Under the OSHA Hazard Communications Standard (29CFR 1910.1200), all personnel working with hazardous materials must have access to Safety Data Sheets or SDS (formerly called MSDS or Material Safety Data Sheets), and be trained in the safe handling of the material. The SDS provides necessary, helpful, and useful information on the properties of the hazardous material. Each person working with hazardous materials should familiarize themselves with those properties before you work with the material. It is a vital safety requirement to be able to refer to the SDS immediately in the event of an emergency and provide a copy to emergency responders. OSHA has ruled that electronic access to SDS is an acceptable alternative to maintaining paper files. Each lab, department, or work group has the option to maintain a hard copy SDS binder or file. As a minimum, each work group should maintain an inventory of hazardous material names and suppliers and methods to quickly and easily access the SDS if there is no hard copy available. Students and student workers are to be instructed that they have ready access to SDS for all hazardous substances with which they may have contact while working in laboratories. They are also to be instructed in the use of SDS.

The laboratory coordinator will be responsible for providing up to date SDS folders in all teaching labs for which hazardous materials are utilized by students. For labs that are do not use hazardous materials for teaching but utilize them for maintenance, the instructor will be responsible for the SDS.

## **HAZARDOUS MATERIAL LABELS**

Hazardous Material containers must be labeled with either the original label or a new label to include the following information: Chemical Name, Hazard(s), Date and Manufacturer or owner. The labels are to be affixed and filled out by the laboratory coordinator or instructor. Hazard designations should be indicated USING the NFPA 704 standard with the colored diamond and appropriate numeric hazard codes. Mixtures can often be rated conservatively by rating each of the individual components and using the highest number for health, flammability and instability (independently). Use judgment in

rating since some of the chemicals can act synergistically different than the individual components, and because the components may be present in different percentages.

## **FLAMMABLE LIQUID/HAZARDOUS MATERIAL LOCKERS**

A method by which the Flammable Liquids/Chemical Lockers can be maintained in a neat, safe, and reliable repository for chemicals is outlined in this section.

Students are never allowed access to the Flammable Liquids/Chemical Lockers unless they are under the immediate supervision of the Laboratory Coordinator, Department Head, or Faculty member.

The storage room should contain only chemicals that will be used within their accepted shelf life. Chemicals should be removed and disposed of, following the guidelines for disposal of chemicals, when they fall in one of the following categories.

1. Any hazardous material whose label has fallen off or the label is not readable.
2. Any hazardous material whose cap has broken or cracked.
3. Any hazardous material that has obviously reacted with the air or water.
4. Any hazardous material that is unusually dangerous, such as explosives (picric acid)

The chemical storage area should be inspected at least once a semester and hazardous material that fall in any of the following categories should be removed and disposed of using the proper disposal procedure.

### **Hazardous Materials Acquisition**

All incoming containers of hazardous material should be given an indelible, corrosion-resistant date of arrival on the container. Each arriving hazardous material should be entered into the hazardous materials inventory system.

### **Hazardous Materials Inventory Procedures**

It is important to keep an updated inventory of the hazardous material on hand for safety and financial reasons.

The hazardous materials inventory system requires that all hazardous material be logged out and logged whenever removed from or returned to the Flammable Liquids/Chemical Lockers.

## HAZARDOUS MATERIALS STORAGE BY GROUP (Flammable, Acids, etc.)

Southeastern Louisiana University Laboratories voluntarily aims to meet OSHA Laboratory Safety Requirements. These requirements are written in the Code of Federal Regulations 1910.1450 (available in the Federal Documents Sections 3<sup>rd</sup> floor Sims Library) and "Prudent Practices" by the National Research Council available in its entirety from the National Academy Press 2101 Constitution Ave, NW Washington DC20418 (or in excerpt in "Laboratory Safety: Principles and Practices", Fleming, et al. (Sims QR 64.7 L33 1995)).

Of particular interest is the Code of Federal Regulations (CFR, 1910.1450, D.2. b, c and d.) A summary of general guidelines for safe storage of chemicals follows. This guideline is not complete. Specific compounds should be stored according to the procedure documented in its SDS. Whenever in doubt consult the SDS of the original chemical manufacturer.

### Flammable Solvents

These are materials that have a flash point below 100 F.

1. Store in approved safety cans or cabinets.
2. Segregate from oxidizing acids and oxidizers.
3. Keep away any source of ignition: flames, localized heat or sparks.
4. Safety cans or drums containing flammable liquids should be grounded and bonded when being used.
5. Keep fire-fighting equipment readily available.
6. Have spill cleanup materials handy.
7. Store highly volatile flammable liquids in a specially equipped refrigerator.  
Examples: Hydrocarbons, ketones, alcohols, ethers, esters etc.

### Bronsted Acids

These are materials that are proton donors

1. Store large bottles of acids on low shelf or in acid cabinets.
2. Segregate oxidizing agents from organic acids, flammable and combustible materials.
3. Segregate acids from bases and active metals such as sodium, potassium, magnesium, etc.
4. Segregate acids from chemicals which could generate toxic gases upon contact such as sodium cyanide, iron sulfide, etc.

5. Use bottle carriers for transporting acid bottles.
6. Have spill control pillows or acid neutralizers available in case of acid spills.  
Examples: Hydrochloric Acid, Nitric Acid, Sulfuric Acid.

### **Toxic Compounds**

These materials may produce bodily injury when encountered.

1. Store according to hazardous nature of chemical.
2. Label container as toxic.
3. Personal Protective Equipment (goggles, gloves, fume hood) need to be utilized when using material.  
Examples: Halogens, Carbon Monoxide, Lead, Mercury, Halogenated hydrocarbons, etc.

### **Light-Sensitive Materials**

These materials will react or decompose when exposed to light.

1. Avoid exposure to light. Store in amber bottles or wrapped in Aluminum foil.  
Examples: Ethyl ether, Mercuric salts, Silver salts, Bromine

### **Carcinogenic Materials**

These materials have a high probability of causing cancer

1. Label all containers as Cancer Suspect Agents.
2. Store according to hazardous nature of chemical, using appropriate security when necessary  
Examples: Benzene, Chromium Oxide, Cadmium compounds, Arsenic compounds.

## **HAZARDOUS MATERIAL WASTE/USED**

Hazardous Materials that have no anticipated safe future use should be disposed of in a timely and safe manner.

Segregate halogenated and non-halogenated materials. Do not combine materials in a waste container which may react with each other. Combine materials of similar composition and toxicity which will not react with each other. For instance, a series of non-halogenated organic solvents can often be combined in a common waste container.

Do not combine any materials without detailed knowledge of how they will (will not) react with each other.

Label each waste container with the following information.

1. Complete name of each and every chemical contained.
2. Name of Responsible Individual.
3. Room from which it originated.

Waste containers must be made of appropriate material that does not react with the waste chemicals. DO NOT use glass waste bottles for materials which could develop pressure. USE plastic waste containers whenever possible. DO NOT use plastic waste containers with materials which could compromise the integrity of the plastic. Waste containers must have secure fitting lids. Waste containers should not be identifiable (by shape, lid or label) as empty food containers.

## **COMPUTER SCIENCE AND TECHNOLOGY BUILDING HVAC SYSTEM**

The heating ventilation and air conditioning system will only function properly and safely if doors are kept closed. The Life Safety Code (NFPA 101) under which this building was reviewed, requires that each space be separated from the corridor by rated doors. In the event of an emergency, this separation should provide adequate time to evacuate the building before smoke or fire would block the means of egress. The HVAC system was balanced with corridor doors closed. Each laboratory was balanced such that it was negative in pressure with respect to the corridor. In the event of smoke generation within a laboratory, the air handler serving that area will stop. If the doors are closed, smoke should be contained within that area for sufficient time required for the evacuation of the building.

## **GENERAL LABORATORY PROTOCOL**

Good Laboratory Practices should be in operation in all teaching and research labs. These good practices include the following.

1. Good housekeeping and tidiness.
2. Keep all aisles and exits clear of obstacles.



3. Reduce all tripping, slipping, and fall hazards.
4. Clean all workspaces within a reasonable amount of time after work is finished.
5. Label all containers with chemical content and responsible person name.
6. Keep eyewashes, showers, and all other safety equipment in well maintained and easily accessible manner.
7. Have spill kits readily available.
8. Have evacuation routes clearly posted.
9. Have emergency contact numbers clearly posted.
10. Have reactive chemicals properly stored and well labeled.
11. Have appropriate personal protection equipment (PPE) available and in good condition. (goggles, gloves, etc.)
12. Have appropriate safety instructions readily available.
13. Routinely carry out safety self-inspections.
14. Have SDS and other safety information readily on hand.
15. Keep laboratory doors closed.

## **CHEMICAL FUME HOODS**

Fume hoods capture, contain, and expel emissions generated by chemicals. In general, it is a good idea to conduct all laboratory chemical experiments in a fume hood.

Before using the hood, make sure that the main switch is on. If you have any question concerning the operation contact the Lab Coordinator x3310 in room 3009.

Never place any body part other than your hands inside a fume hood.

Do not use the laboratory fume hoods as a chemical storage cabinet. If a hood contains a large quantity of bottled chemicals, it is time to do some housekeeping and return the chemicals to the chemical storeroom or the hazardous waste storage (whichever is appropriate).

The fume hoods in each location will only develop proper air flow if the doors to the room in which the hoods are installed are kept closed. When doors are propped open, the air balance to the space is altered.

Hoods in for Computer Science and Technology Building are not certified for use with Hazardous

Chemicals (NFPA 45)

Do not use hoods to as storage cabinets or to place other objects inside them (i.e. ovens)

## **BROKEN GLASS DISPOSAL**

All broken glass shall be placed into a cardboard box that is labeled “CAUTION SHARP OBJECTS” or “CAUTION BROKEN GLASS”. When the container is full it shall be securely closed (with tape) and taken to the outside dumpster.

## **COMPRESSED GAS CYLINDERS**

Cylinders must have the valve covered with its metal cover, if so designed, before moving or transporting. Cylinders should be transported using a hand truck that has a chain or belt to secure the cylinder. When the cylinder is in place it should be clamped securely to the wall or counter top before the metal valve cover is removed. Every effort should be made not to drop cylinders or allow them to strike other cylinders or walls violently. If you are not sure of the proper procedure of connecting a cylinder to a regulator, please contact responsible faculty or the Lab Coordinator (3310). When a cylinder becomes empty, write “EMPTY” with chalk on the cylinder or attach an “EMPTY” tag and return it to the storage area and order another tank to replace it.

Always consider a cylinder as being full, and handle them with care. Do not test a cylinder to see if it has gas in it by opening the valve without a regulator on it.

The fusible safety plugs on acetylene cylinders melt at about the boiling point of water. If an outlet becomes clogged with ice or frozen, it should be thawed with warm (not boiling) water applied only to the valve. Never use a flame on any cylinder or valve.

### **Using Cylinders**

1. Cylinders that contain liquefied gases and acetylene should be used in an upright position and be secured against accidentally being knocked over. For that matter, all compressed gas cylinders must be secured to the wall or counter top by chains or cylinder belt clamps.
2. Make sure that the correct pressure reducing regulator designed for the particular gas is used for each cylinder and be sure to leak test cylinder and regulator before use.
3. Before a regulator is removed from a cylinder valve, close the cylinder valve and release the gas from the regulator.
4. Unless the cylinder valve has first been closed tightly, do not attempt to stop a leak between the cylinder and the regulator by tightening the union nut.
5. Never use oil or grease as a lubricant on valves or attachments of oxygen cylinders. Never use oxygen as a substitute for compressed air.

6. Be aware that some cylinders have left handed threads (denoted by a notched nut). These cylinders typically require special procedures (as with oxygen). Be careful not to damage the threads by attempting to turn in wrong direction.
7. If a leak is suspected in a fuel gas cylinder, do not use a flame for detection; rather a soapy water solution or other suitable “snoop” solution should be used. If the leak cannot be remedied by closing a valve or tightening a packing nut, emergency action should be affected. A cylinder in which leaks occur should be taken out of use immediately and handled as follows:
  - a. Close the valve and take the cylinder outdoors well away from any source of ignition. Properly tag the cylinder and notify the supplier and University Police. A regulator attached to the valve may be used temporarily to stop a leak through the valve seat.
  - b. If the leak occurs at a fuse plug or other safety device, take the cylinder outdoors well away from any source of ignition. Notify University Police so they can maintain a safety area around the cylinder so that no one brings a cigarette or any other spark source into the area and notify the supplier of the cylinder. It is suggested that the fire department be notified by University Police.

### **Storage of Cylinders**

1. Cylinders should be stored in a safe, dry, and well-ventilated place prepared and reserved for this purpose. Cylinders are not designed for temperatures in excess of 130°F (54°C). Thus, do not store near heaters, radiators, furnaces, or any other heat source (continuous sunlight).
2. Cylinders of oxygen should not be stored within 20 feet of cylinders containing flammable gases or highly combustible materials.

For more information on cylinders: refer to Southeastern Louisiana Safety Manual Section II pages 16-20.

### **ROTATING AND PINCHING HAZARDS**

Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.

## **THERMAL HAZARDS**

There are many heating devices located throughout for Computer Science and Technology Building; for example, Cole-Parmer Box Furnaces. Most items appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

## **ELECTRICAL HAZARDS**

Before working on any 120V, 208V, 240V, 277V or 480V, equipment, be sure the equipment is not energized and cannot be easily reenergized. Unplug the equipment and ensure the plug is within your control at all times while working on the equipment. LOCK OUT /TAG OUT procedures should be used where the energizing mechanism is not within your control at all times while manipulating.

Equipment over 120V should only be worked on by an authorized person.

# INDUSTRIAL AND ENGINEERING TECHNOLOGY DEPARTMENT ACCIDENT/INCIDENT REPORT FORM

Date of accident: \_\_\_\_\_ Time of accident: \_\_\_\_\_ am pm  
Name of injured person: \_\_\_\_\_  
Did accident occur during regularly scheduled period?  Yes  No  
Course number and section of class: \_\_\_\_\_  
Action being conducted during accident: \_\_\_\_\_  
Exact Location where accident occurred: \_\_\_\_\_

Instructor in charge: \_\_\_\_\_  
Instructor's description of accident (attach additional sheet if necessary) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other Witnesses: \_\_\_\_\_  
Was instructor in area when accident occurred?  Yes  No  
If not, explain why not present \_\_\_\_\_

Was University Police notified?  Yes  No Time: \_\_\_\_\_ am pm  
Name of police officer or Ambulance service transporting victim: \_\_\_\_\_  
Name of attending physician or hospital: \_\_\_\_\_  
Was Health Center notified?  Yes  No Time: \_\_\_\_\_ am pm  
Name of Health Center Staff member receiving call: \_\_\_\_\_  
Was student escorted to Health Center  Yes  No; By whom: \_\_\_\_\_  
Was any minor first aid given to victim prior to police arrival or transport to Student Health Center?  
 Yes  No If so, what? \_\_\_\_\_

Did victim refuse further assistance (first aid by police, call to police, transport by ambulance, escort to Health Center)  Yes  No If so, why \_\_\_\_\_

I verify that I have refused further medical assistance

\_\_\_\_\_  
(signature)

I certify that to the best of my knowledge that the above information is correct.

\_\_\_\_\_  
(signature of instructor)

\_\_\_\_\_  
Date of Report

# **SAFETY PROCEDURES FOR GENERAL LABORATORIES**

General Safety Policy for Students in Industrial and Engineering Technology.

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

## **CONDITIONS OF YOUR WORK AREA**

You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. Before you leave the lab, be prepared to have your station inspected by your instructor.

## **CHEMICAL SPILLS**

All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

## **EYE PROTECTION**

Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended, however ACS indicates that these lenses are acceptable with proper safety goggles. It is required that you wear safety goggles over your regular prescription glasses.

## **DISPOSAL OF WASTE MATERIALS**

Waste chemicals are to be discarded in the properly labeled waste container. **BE SURE TO READ THE LABEL ON THE WASTE CONTAINER.** Waste paper, towels, and other trash should be discarded in the waste baskets.

## **EATING OR DRINKING**

Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

## **SMOKING**

Smoking is not allowed in any building on campus.

## **FIRE IN THE LABORATORY**

Call out "FIRE" and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

## **EVACUATION**

In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

## **FIRE ON A PERSON**

If your clothing or hair catches fire, **DO NOT RUN.** Running only fans the flames and makes them burn faster and hotter. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. **NEVER USE A FIRE EXTINGUISHER ON A PERSON.**

## **CHEMICAL SPILLS ON**

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

### **YOUR EYES**

Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

### **YOUR HANDS OR ARMS**

Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

### **YOUR BODY**

Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Instructor and report to the Health Center.

## **OTHER INJURIES**

In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

## **CHEMICALS**

Never use a chemical from an unlabeled container. Never substitute a chemical in an experiment without the instructor's permission. Always treat unfamiliar chemicals as dangerous.

## **FUME HOOD**

When dispensing or working with volatile chemicals, it is recommended to do so in the fume hood. Never place any body part other than your hands inside the fume hood. When working in fume hood, keep the sash line between you and the material being manipulated.

## **PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY**

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

## **HEALTH CONDITIONS**

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.

# SAFETY PROCEDURES FOR AUTOMATION, CNC, & ROBOTICS ROOM 1005

## General Safety Policy for Students in Automation, CNC, & Robotics Lab Room 1005

The Automation, CNC, and Robotics Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

### General Safety Instructions

1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

### Safety Instruction for Personal Protection

1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any



loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.

4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

#### Safety Instructions for the Use of Tools, Equipment, and Machines

1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting,

- cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
  21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
  22. Keep machines clear of tools, stock, and other items.
  23. Develop a respect for machine tools and understand their purpose.
  24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn't sound right, there is probably something wrong.
  25. Use the proper size and type of hand tool for the specific task.
  26. Use the right tool for the job.
  27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
  28. Clean workstations and place tools in the proper areas at the end of each class period.
  29. When finished with a tool, clean and return it to its proper location.
  30. Ensure that vise hands hang free when not in use.
  31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
  32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
  33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
  34. Make sure that all cutting tools are sharp and in good condition before using them.
  35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
  36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
  37. Pass tools to other persons with handles forward.
  38. Carefully read your lab manual instruction sheets before operating machines and equipment.
  39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

### Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting

9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

EMERGENCIES—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

#### CONDITIONS OF YOUR WORK AREA

You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used glassware and bench top, and replace all equipment in proper location.

#### CHEMICAL SPILLS

In the event of chemical spill in the laboratory, classroom or other building areas, the instructor, engineer or supervisor shall make a determination as to whether or not the emergency can be abated locally. If the best judgment of the person in charge of the situation indicates a need for help, the following actions should be taken. (Remember, if one thinks the emergency is too much for him to handle, it probably is.)

1. Consider the need for evacuation— the room/lab, the floor or the building. If indeed the building must be evacuated, activate the fire alarm.
2. Shut the door or isolate the offending area.
3. Call University Police (2222) and advise them of the problem. The police will provide security and help in the orderly evacuation of persons from the building and/or maintain crowd and traffic control.
4. Call Director of Environmental Health & Safety and report the emergency. Department of Environmental Health & Safety would be greatly interested to know the following:
  - a. Who is calling?
  - b. The exact location of the emergency.
  - c. What has caused the emergency and an estimate of amount of material involved.
  - d. What, if anything, has been done to abate the emergency?

Upon receiving the above information, Director of Environmental Health & Safety will attempt to alleviate the situation or offer suggestions and advise on further action needed.

5. The person reporting the emergency should communicate with the highest interested official, i.e., dean, director, or department head. One or the other or both should meet Environmental Health & Safety Director at or near the emergency site and give them any additional information they think would be useful. A word of caution; no more than two persons should attempt to advise safety personnel. The fewer persons they have to deal with, the faster they can act and more effective they will be.

#### EYE PROTECTION

Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

#### EATING OR DRINKING

Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never taste any chemicals from the laboratory.

#### SMOKING

Smoking is not allowed in any building on campus.

#### EVACUATION

In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

#### FIRE ON A PERSON

If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

#### CHEMICAL SPILLS ON

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Instructor and Laboratory Coordinator.

##### YOUR EYES

Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

##### YOUR HANDS OR ARMS

Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

##### YOUR BODY

Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

#### CHEMICALS

Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

#### PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

#### HEALTH CONDITIONS

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting

spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in select labs.

#### FUME HOOD

Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

#### HAZARD COMMUNICATION

While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions where a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

#### LAB ATTIRE

Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.

# **SAFETY PROCEDURES FOR MACHINE & MANUFACTURING RAPID PROTOTYPING ROOM 1006**

General Safety Policy for Machine & Manufacturing Rapid Prototyping Room 1006

The Machine and Manufacturing Rapid Prototyping Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

## General Safety Instructions

1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

## Safety Instruction for Personal Protection

9. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
10. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
11. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants.

- Remove ties when working with machinery.
12. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
  13. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
  14. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
  15. Wear protective clothing and equipment for the use intended for its wear.
  16. Wash your hands with soap and water as a method of preventing skin disease.

#### Safety Instructions for the Use of Tools, Equipment, and Machines

1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.

20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn't sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
37. Pass tools to other persons with handles forward.
38. Carefully read your lab manual instruction sheets before operating machines and equipment.
39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

### Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions



10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

#### **CONDITIONS OF YOUR WORK AREA**

You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used glassware and bench top, and replace all equipment in proper location.

#### **CHEMICAL SPILLS**

All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

#### **EYE PROTECTION**

Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

#### **EATING OR DRINKING**

Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never taste any chemicals from the laboratory.

#### **SMOKING**

Smoking is not allowed in any building on campus.

#### **EVACUATION**

In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

#### **FIRE ON A PERSON**

If your clothing or hair catches fire, **DO NOT RUN**. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. **NEVER USE A FIRE EXTINGUISHER ON A PERSON.**

#### **CHEMICAL SPILLS ON**

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

#### **YOUR EYES**

Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

#### **YOUR HANDS OR ARMS**

Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

#### YOUR BODY

Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

#### CHEMICALS

Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

#### PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

#### HEALTH CONDITIONS

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify you instructor. Special safety practices may be put in select labs.

#### FUME HOOD

Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

#### HAZARD COMMUNICATION

While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions where a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

#### LAB ATTIRE

Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.

# SAFETY PROCEDURES FOR MATERIAL TESTING LAB ROOM 1018

## General Safety Policy for Material Testing Lab Room 1018

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 985-549-2222.

### EYE PROTECTION

Safety goggles must be worn when performing shock and loading tests on metal and plastic samples.

### ELECTRICITY

Do not insert anything into the electrical outlets on or under the lab tables except the electrical plugs designed for this purpose.

### DISPOSAL OF WASTE MATERIALS

Waste paper, towels, and other trash should be discarded in the waste baskets.

### THERMAL HAZARDS

There are 4 heating devices located Material Testing Lab, Cole-Parmer Box Furnaces. These box furnaces operate from room temperature 30°C/72°F to 11000°C/19832°F. Box furnaces may appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

### SMOKING

Smoking is not allowed in any building on campus.

### FIRE IN THE LABORATORY

Call out "FIRE" and get away from the fire. Notify the instructor. Pull the fire alarm, and then evacuate the building.

### EVACUATION

In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave the room by the East door and evacuate the building by the East door. Check in with the instructor at Railroad Street Park to ensure your safety and that no rescue is necessary. Do not return to the building until told to do so.

### General Safety Instructions

1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.

7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

#### Safety Instruction for Personal Protection

1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

#### Safety Instructions for the Use of Tools, Equipment, and Machines

1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.

12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn't sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
37. Pass tools to other persons with handles forward.
38. Carefully read your lab manual instruction sheets before operating machines and equipment.
39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

### Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information

5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

# **SAFETY PROCEDURES FOR CONSTRUCTION TECHNOLOGY LAB ROOM 1019**

## General Safety Policy for Construction Technology Lab Room 1019

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

### **CONDITIONS OF YOUR WORK AREA**

You should maintain a work area that is free of unnecessary clutter. Store personal items out of the way while working in lab. Clean up all bench tops and surrounding area before departing lab. Replace all equipment in proper location. If you find a messy lab when you enter, notify the Laboratory Coordinator as to the time, place, and nature of the incident.

### **EYE PROTECTION**

Safety goggles must be worn at all times when you are in the laboratory and equipment is in use..

### General Safety Instructions

1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments.
14. If you feel ill, do not work in the lab. Report to your instructor.
15. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

### Safety Instruction for Personal Protection

1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.

5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

### Safety Instructions for the Use of Tools, Equipment, and Machines

1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
6. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
7. Machines must be operated by only one person at a time.
8. Do not talk with or otherwise distract other students while you or they are operating machines.
9. Persons not operating power tools or machinery should keep clear of the operator and the work area.
10. Never leave a machine while it is running.
11. When in use, give the machine your undivided attention; never look away for any reason.
12. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
13. Do not stop or start a machine for another person except in an emergency.
14. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
15. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
16. Check machines and make all adjustments before turning on the power.
17. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
18. Make sure other persons are clear before starting machinery.
19. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
20. Keep machines clear of tools, stock, and other items.
21. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn't sound right, there is probably something wrong.
22. Use the proper size and type of hand tool for the specific task.
23. Use the right tool for the job.
24. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
25. Clean workstations and place tools in the proper areas at the end of each class period.
26. When finished with a tool, clean and return it to its proper location.
27. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
28. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
29. Make sure that all cutting tools are sharp and in good condition before using them.
30. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from



yourself and others.

31. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
32. Pass tools to other persons with handles forward.
33. Carefully read your lab manual instruction sheets before operating machines and equipment.
34. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

### Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

# **SAFETY PROCEDURES FOR INDUSTRIAL HYGIENE & FIRE PROTECTION LAB ROOM 2005**

General Safety Policy for Industrial Hygiene & Fire Protection Lab Room 2005

**EMERGENCIES**—In case of an emergency when the supervisor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

## **SAFETY DATA SHEETS**

Under the OSHA Hazard Communications Standard (29CFR 1910.1200), all personnel working with hazardous materials must have access to Safety Data Sheets or SDS (formerly classed MSDS or Material Safety Data Sheets), and be trained in the safe handling of the material. The SDS provide necessary, helpful, and useful information on the properties of the hazardous material. You should familiarize yourself with those properties before you work with the material. It is vital to your safety to be able to refer to the SDS immediately in the event of an emergency and provide a copy to emergency responders. Your instructors or research directors or supervisor will endeavor to alert you to the hazards of materials used in the laboratories; however, you may read the SDS should you desire to review the information provided there in. Updated Safety Data Sheets (SDS) shall be kept readily available.

## **LAB ATTIRE**

Safe laboratory practices mandate proper attire for handling unknown or hazardous chemicals. Departmental policy forbids students from entering the lab if they are non-compliant with safety policy (including attire items 1-5 below).

1. ALWAYS wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a pony-tail
4. If you have long, baggy sleeves roll them up or bind them close.
5. Wear proper gloves when appropriate.

## **CONDITIONS OF YOUR WORK AREA**

You should maintain a work area that is free of unnecessary clutter. Store personal items out of the way while working in lab. Clean up all bench tops, fume hoods, and surrounding area before departing lab. Replace all equipment in proper location. If you find a messy lab when you enter, notify the Laboratory Coordinator as to the time, place, and nature of the incident.

## **EYE PROTECTION**

Safety goggles must be worn at all times when you are in the laboratory.

## **DISPOSAL OF NON-CHEMICAL WASTE MATERIALS**

Broken glass tubes for gas detection pump should be placed in the broken glass container. Waste paper towels, filter paper, boiling stones and other trash should be discarded in the waste baskets.

## **EATING OR DRINKING**

Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in the laboratory. No chewing gum and no hard candy. Never taste any chemicals from the laboratory.

## **FIRE IN THE LABORATORY**

Call out "FIRE" and get away from the fire. Immediately notify any faculty member. Small, self-contained fires with limited fuel source may be extinguished by covering with a watch glass or simply allowing it to burn itself out. Small to Medium fires may be extinguished by the instructor using a fire extinguisher located in the lab. Medium to Large fires demand evacuation of the building. Pull the fire alarm, and then evacuate the building.

## EVACUATION

In case of Computer Science and Technology Building evacuation, leaving behind all personal objects, leave room by nearest exit and using evacuation route proceed directly to Railroad Street Park. Check in with instructor at Railroad Street Park to ensure your safety and that no rescue is necessary. Do not leave until told to do so.

## FIRE ON A PERSON

If your clothing or hair catches fire, DO NOT RUN. Running only fans the flames. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. NEVER USE A FIRE EXTINGUISHER ON A PERSON.

## CHEMICAL SPILLS ON

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Instructor immediately.

### YOUR EYES

Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

### YOUR HANDS OR ARMS

Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Instructor and report to the Health Center. Always wash your hands before you leave the laboratory.

### YOUR BODY

Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Instructor and report to the Health Center.

## ALLERGY/CHEMICAL SENSITIVITY

Due to the possibility of contact with chemicals, please self-notify the Lab Coordinator if you have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester.

## HEALTH CONDITIONS

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify the Lab Coordinator. Special safety practices may be put in place.

## FUME HOOD

Never place any body part other than your hands inside the fume hood. When working in fume hood, keep the sash line between you and the material being manipulated. When working with particularly hazardous materials, it is recommended that the sash be pulled down so that there is a solid barrier between you and the chemicals. Never dispense chemicals on the air foil sill of the hood. This creates a potential spill hazard and interrupts proper air flow.

This Safety Policy is by no means a complete and absolute statement of laboratory safety instructions. The Lab Coordinator will periodically point out other safety precautions.

## **SAFETY PROCEDURES FOR FLUID POWER & THERMAL FLUID LAB ROOM 2006**

General Safety Policy for Fluid Power & Thermal Fluid Lab Room 2006

The Fluid Power and Thermal Fluid Lab has enjoyed an excellent safety record. This is directly attributed to the combined efforts of the students, faculty, and staff alike. We must all follow correct safety procedures while working in all of the Manufacturing Laboratories. This will enable us to accomplish our goals of maintaining a healthy and accident free environment, to promote a positive safety attitude, and to learn the practical aspects of safety in the workplace appropriate for future supervisors and teachers.

The following safety rules are divided into the four major areas of General Safety Instructions, Safety Instructions for Personal Protection, Safety Instruction for the Use of Tools, Equipment, and Machines, and Personal Attitudes and Conduct.

### General Safety Instructions

1. ABC – Always Be Careful. Never take chances.
2. Observe all safety rules.
3. Report immediately to your instructor upon incurring any injury, even though you feel it is negligible.
4. No horseplay or playing practical jokes in the laboratory.
5. Caution any person you see violating a safety rule.
6. Do not run in the lab.
7. Be considerate of the safety of others.
8. Never throw any object in the laboratory.
9. Learn the location and use of the fire extinguishers.
10. In the event of fire, notify the instructor immediately.
11. Insure that there is adequate ventilation for the task being performed. Occasionally, a window may need to be opened or a fan may be needed to help circulate the air.
12. Follow prescribed safety instructions in lifting or handling awkward, large, heavy, and or long pieces of material. In general, never carry material over six feet in length or over 50 pounds in weight without assistance. Lift with your legs, not your back.
13. Never use compressed air for purposes other than specified in your experiments. Likewise, be careful around pressurized hydraulic systems.
14. Make certain your hands and tools are kept free of oil and grease.
15. If you feel ill, do not work in the lab. Report to your instructor.
16. Never treat, or remove particles from the eye. See your instructor or school health personnel for immediate attention.

### Safety Instruction for Personal Protection

1. Wear proper eye protection while participating in activities that may pose danger to your eyes. All forms of eye protection must conform to OSHA specs Z87.1, and must have clear lenses and be equipped with side shields.
2. Wear ear protective devices if sharp sounds or excessive noise is anticipated.
3. Be sure your clothes are safe and suitable for laboratory work. Remove or fasten any loose clothing. Roll loose sleeves above your elbows. Tuck shirttails into your pants. Remove ties when working with machinery.
4. Keep your hair away from machinery. Students with long hair must confine their hair in nets or caps when around tools, equipment, and machinery.
5. Rings, bracelets, watches, and other jewelry must be removed when working in the laboratory.
6. Wear rubber gloves when handling caustic materials, acids, and/or petroleum distillates.
7. Wear protective clothing and equipment for the use intended for its wear.
8. Wash your hands with soap and water as a method of preventing skin disease.

### Safety Instructions for the Use of Tools, Equipment, and Machines

1. Do not use tools, equipment, and machines until instruction relative to their safe operation has been given.
2. Observe safety rules for all machines and equipment. Follow prescribed procedures when working with mechanical, electrical, fluid, or combined power systems.
3. Know and follow the specific requirements of the kind and type of machine you are operating.
4. Secure approval of your instructor before you begin working. This applies to all experiments and projects in which you use the lab tools, equipment, machines, and supplies.
5. Have your instructor check special machine setups.
6. Students may use the tools, machines, and equipment only when the instructor is present in the lab.
7. Do not use defective tools, machines, and equipment. Inform the instructor immediately.
8. Be sure the guards are in place and functioning properly before turning on machinery. Do not remove guards and other safety devices.
9. Machines must be operated by only one person at a time.
10. Do not talk with or otherwise distract other students while you or they are operating machines.
11. Persons not operating power tools or machinery should keep clear of the operator and the work area.
12. Never leave a machine while it is running.
13. When in use, give the machine your undivided attention; never look away for any reason.
14. Allow revolving machinery to stop on its own. Resist the desire to grab chucks, spindles, or other rotating parts with the hand.
15. Do not stop or start a machine for another person except in an emergency.
16. Do not tamper with adjustments or play with machinery at any time. Serious accidents may result.
17. Do not lean on machines and equipment. You may press a switch or throw a control which could endanger the safety of the operator or damage the machine.
18. Check machines and make all adjustments before turning on the power.
19. Turn power off and allow the machine to come to a complete stop before adjusting, cleaning, removing work, or making new set-ups.
20. Make sure other persons are clear before starting machinery.
21. Allow a safe distance between your hands and blades, cutters, or moving parts. Keep your fingers in such a position that there is no danger of their slipping into the cutter or moving parts.
22. Keep machines clear of tools, stock, and other items.
23. Develop a respect for machine tools and understand their purpose.
24. Recognize the distinctive sound of a properly adjusted and smooth-running machine tool. If something doesn't sound right, there is probably something wrong.
25. Use the proper size and type of hand tool for the specific task.
26. Use the right tool for the job.
27. Keep tools and materials from projecting over the edge of your workstation so that others will not walk into them and become injured.
28. Clean workstations and place tools in the proper areas at the end of each class period.
29. When finished with a tool, clean and return it to its proper location.
30. Ensure that vise hands hang free when not in use.
31. Be aware of pinch points around vises, presses, hydraulic and pneumatic components, and other such hazardous areas when working with machines and equipment.
32. Keep the floor around the tools clear of liquids, scraps, tools, and other materials.
33. If oil is spilled on the lab floor, immediately stop what you are doing and clean up the spill.
34. Make sure that all cutting tools are sharp and in good condition before using them.
35. Handle edged or pointed tools by the handles, with sharp points or edges pointed away from

- yourself and others.
36. When using sharp-edged tools, be sure to direct their action away from yourself and your classmates.
  37. Pass tools to other persons with handles forward.
  38. Carefully read your lab manual instruction sheets before operating machines and equipment.
  39. Avoid using wrenches that do not properly fit the nuts, bolts, or other objects which they are being used to turn.

### Personal Attitudes and Conduct

Violation of the following indicates a deficient attitude toward safety. Violation of these concepts will not be tolerated. Almost all accidents that occur in the industrial technology laboratories are attributable to one of the causes listed.

1. Taking unnecessary chances
2. Getting in too big a hurry
3. Showing off
4. Lack of information
5. Preoccupation of the mind
6. Distraction of attention
7. Fear
8. Experimenting
9. Failure to follow instructions
10. Poor discipline
11. Guard removal
12. Excitement
13. Selfishness
14. Improper Clothing
15. Poor Health

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone.

#### **CONDITIONS OF YOUR WORK AREA**

You should maintain a work area that is free of unnecessary equipment, books, coats, purses, excess chemicals, and trash. Keep aisles and exits unobstructed. At conclusion of lab, clean all used items and bench top, and replace all equipment in proper location.

#### **CHEMICAL SPILLS**

All chemical spills should be cleaned up immediately by the proper procedure (if you do not know the correct procedure, notify your instructor for instructions).

#### **EYE PROTECTION**

Safety goggles must be worn at all times when you are in the laboratory. Contact lenses are not recommended to be worn; however, ACS indicates that these lenses are acceptable with proper safety goggles. It is recommended that you wear a regular pair of prescription glasses under your safety goggles.

#### **EATING OR DRINKING**

Since there is a possibility of food and drink becoming contaminated with toxic chemicals or bacteria, no eating or drinking is allowed in the laboratory (this includes chewing gum and hard candy). Never taste any chemicals from the laboratory.

## SMOKING

Smoking is not allowed in any building on campus.

## EVACUATION

In case of Computer Science and Technology Building evacuation, leave behind all personal objects, leave room by the nearest exit and proceed directly to Railroad Street Park. Evacuation routes are posted adjacent to all classroom exits. Check in with the instructor at Railroad Street Park to ensure your safety and to verify that no rescue is necessary. Do not leave until told to do so.

## FIRE ON A PERSON

If your clothing or hair catches fire, **DO NOT RUN**. Running only fans the flames and makes them burn faster and hotter. Go immediately to, and use, the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. **NEVER USE A FIRE EXTINGUISHER ON A PERSON.**

## CHEMICAL SPILLS ON

Remember that speed in washing to remove the chemical is most important in reducing the extent of injury. Wash off the contaminated area immediately. Notify the Laboratory Coordinator.

### YOUR EYES

Immediately go to the eye wash station and while holding your eye open, irrigate the eye completely for at least 15-30 minutes. Report to the Student Health Center.

### YOUR HANDS OR ARMS

Immediately go to the sink and wash your hands until they are no longer contaminated. If a chemical burn has occurred, notify the Lab Coordinator and report to the Health Center. Always wash your hands before you leave the laboratory.

### YOUR BODY

Immediately go to the safety showers, pull the shower lever, and with the water running remove any contaminated clothing. Stay under the shower until all of the contamination has been washed away. Notify the Lab Coordinator and report to the Health Center.

## CHEMICALS

Never use a chemical from an unlabeled container. Always treat unfamiliar or unlabeled chemicals as if they are dangerous.

## PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

## HEALTH CONDITIONS

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in select labs.

## FUME HOOD

Never place any body part other than your hands inside the fume hood. When working in fume hoods, keep the sash line between you and the material being manipulated.

## HAZARD COMMUNICATION

While academic laboratories do not fall under the purview of OSHA, students graduating in the sciences are likely to be hired into positions where a basic knowledge of chemical safety and its hazard communication are expected and required by law. OSHA Hazard Communications

Standard 29 CFR 1910.1200 requires written communication of the hazards associated with chemicals, proper labeling of hazardous chemicals and access to safety data sheets, and safety training.

#### LAB ATTIRE

Safety practices mandate proper attire for handling unknown or hazardous chemicals. The department is not required to provide make-up labs due to safety noncompliance.

1. Always wear eye protection.
2. DO NOT wear sandals or open-toe shoes.
3. If you have long hair, pull it back in a bun or a ponytail
4. If you have on long, baggy sleeves, roll them up.
5. Shorts are acceptable provided they are knee length. You should also consider wearing a lab coat or plastic apron.



# SAFETY PROCEDURES FOR MECHATRONICS LAB ROOM 2013

## General Safety Policy for Mechatronics Lab Room 2013

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today's electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

1. ALWAYS wear your SAFETY GLASSES.
2. KEEP soldering irons in their protective STAND when not in use.
3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
7. AVOID SKIN CONTACT with chemicals.
8. REPLACE ALL screws, not just some.
9. Use the CORRECT CLEANING SOLVENTS for the job.
10. Avoid PINCHING wires when putting equipment back together.
11. Use a HEAT SINK when soldering temperature-sensitive components.
12. NEVER SOLDER a circuit that has the power applied.
13. DOUBLE CHECK circuits for proper connections and polarity prior to applying the power.
14. Observe POLARITY when connecting polarized components or test equipment into a circuit.
15. When soldering a multi-pin component, avoid excessive heating to one area of the component; DO NOT go from pin to pin in a straight line.
16. Make sure TEST instruments are set for proper FUNCTION AND RANGE prior to taking a measurement.
17. When measuring UNCERTAIN qualities, start with the range switch on the HIGHEST setting.
18. ALWAYS REPLACE shields that were removed during service to avoid signal RADIATION.
19. When cutting with an X-Acto knife, AVOID CUTTING TOWARDS yourself.
20. Apply HEAT from a soldering pencil for no more than a couple of seconds to AVOID HEAT DAMAGE.
21. Keep the INTENSITY on oscilloscopes as LOW as possible when in use and all the way down when not in use to avoid burning out the screen.
22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use

### ROTATING AND PINCHING HAZARDS

Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.

# **SAFETY PROCEDURES FOR ELECTRONICS LAB ROOMS 2014 & 2016**

## General Safety Policy for Electronics Lab Rooms 2014 & 2016

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today's electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

1. ALWAYS wear your SAFETY GLASSES.
2. KEEP soldering irons in their protective STAND when not in use.
3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
7. AVOID SKIN CONTACT with chemicals.
8. REPLACE ALL screws, not just some.
9. Use the CORRECT CLEANING SOLVENTS for the job.
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22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use

# **SAFETY PROCEDURES FOR DRAFTING DESIGN LAB ROOMS 2029 & 2030**

## General Safety Policy for Drafting Design Lab Rooms 2029 & 2030

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

### **EATING OR DRINKING**

Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

### **SMOKING**

Smoking is not allowed in any building on campus.

### **FIRE IN THE LABORATORY**

Call out "FIRE" and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

### **EVACUATION**

In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

### **FIRE ON A PERSON**

If your clothing or hair catches fire, **DO NOT RUN**. Running only fans the flames and makes them burn faster and hotter. Go immediately to and use the safety shower and call out for help. Stay under the shower until the fire is out and the skin temperature has cooled down. If you are in a lab where a person is on fire, it is your responsibility to help that person get under the safety shower and assist them in any way that you can. **NEVER USE A FIRE EXTINGUISHER ON A PERSON.**

### **OTHER INJURIES**

In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

### **PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY**

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

### **HEALTH CONDITIONS**

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.

# **SAFETY PROCEDURES FOR FACULTY RESEARCH LABS ROOM 3007, 3008, 3009, & 3010**

General Safety Policy for Faculty Research Labs Rooms 3007, 3008, 3009, & 3010

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

## **EATING OR DRINKING**

Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

## **SMOKING**

Smoking is not allowed in any building on campus.

## **FIRE IN THE LABORATORY**

Call out “FIRE” and get away from the fire. Notify the instructor. Your safety is the number one priority. Some small fires may be extinguished as discussed, the first day of lab. Medium to Large fires will require evacuation of the building. Pull the fire alarm, and then evacuate the building.

## **EVACUATION**

In case of evacuation, leave behind all personal objects, leave the room by nearest exit and proceed directly to Railroad Street Park. Evacuation Routes are posted adjacent to all classroom exit

doors. Check in with instructor at Railroad Street Park to ensure your safety and verify that no rescue is necessary. Do not leave until told to do so.

## **FIRE ON A PERSON**

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## **OTHER INJURIES**

In the event that you or your lab partner cuts themselves or burns themselves, you should notify your instructor immediately.

## **PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY**

Due to the possibility of contact with chemicals, please self-notify your instructor if you are currently pregnant, have a known allergy or have a known chemical sensitivity or if you develop of any of these conditions during the semester. Additional safety equipment (such as gloves and lab coats) may be put in place. You may be forbidden from participating in select labs.

## **HEALTH CONDITIONS**

If you have a condition that may impact the safety of yourself or others in the lab (such as fainting spells, seizures, tremors, etc.) notify your instructor. Special safety practices may be put in place.

Following proper safety practices are a must when working with electronic equipment. Not only is there the danger of electrical shock, but the components can explode if not connected properly. Many of today's electronic components are easily damaged by improper handling. The test equipment used in the electronic service industry is expensive and easily damaged if proper operating procedures are not followed.

1. ALWAYS wear your SAFETY GLASSES.
2. KEEP soldering irons in their protective STAND when not in use.
3. Always CUT wire LEADS so the clipped wire falls on the table top and not toward others.
4. DO NOT TOUCH the tip end of a soldering iron to check for heat.
5. AVOID an EARTH GROUND when working with AC powered units.
6. ONLY work with powered units WHEN NECESSARY for troubleshooting.
7. AVOID SKIN CONTACT with chemicals.
8. REPLACE ALL screws, not just some.
9. Use the CORRECT CLEANING SOLVENTS for the job.
10. Avoid PINCHING wires when putting equipment back together.
11. Use a HEAT SINK when soldering temperature-sensitive components.
12. NEVER SOLDER a circuit that has the power applied.
13. DOUBLE CHECK circuits for proper connections and polarity prior to applying the power.
14. Observe POLARITY when connecting polarized components or test equipment into a circuit.
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16. Make sure TEST instruments are set for proper FUNCTION AND RANGE prior to taking a measurement.
17. When measuring UNCERTAIN qualities, start with the range switch on the HIGHEST setting.
18. ALWAYS REPLACE shields that were removed during service to avoid signal RADIATION.
19. When cutting with an X-Acto knife, AVOID CUTTING TOWARDS yourself.
20. Apply HEAT from a soldering pencil for no more than a couple of seconds to AVOID HEAT DAMAGE.
21. Keep the INTENSITY on oscilloscopes as LOW as possible when in use and all the way down when not in use to avoid burning out the screen.
22. Always OBSERVE POLARITY when connecting components into a circuit, especially with electrolytic capacitors.
23. Always READ the SDS (Safety and Data Sheet) for all chemicals prior to their use

#### ROTATING AND PINCHING HAZARDS

Hand injuries are commonly caused by simple pinching and binding. The best prevention is to keep fingers, loose clothing, and hair far removed from all rotating equipment. All rotating equipment should have adequate guards or warnings in place. Bind hair and keep loose clothing to a minimum when operating such equipment. If necessary to have hands in close proximity to rotating equipment, ensure that proper guards are in place.

# **SAFETY PROCEDURES FOR SENIOR RESEARCH LAB ROOM 3057**

## General Safety Policy for Senior Research Lab Room 3057

**EMERGENCIES**—In case of an emergency when the instructor is unavailable or incapacitated, call University Police at 2222 using the laboratory telephone. When using a cell phone, it is necessary to dial (985)-549-2222.

### **EATING OR DRINKING**

Since there is a possibility of food substance becoming contaminated with toxic chemicals, no eating or drinking will be allowed in any of the laboratories. No chewing gum or hard candy. Never taste any chemicals from the laboratory.

### **SMOKING**

Smoking is not allowed in any building on campus.

### **FIRE IN THE LABORATORY**

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### **EVACUATION**

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### **OTHER INJURIES**

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### **PREGNANCY/ALLERGY/CHEMICAL SENSITIVITY**

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### **HEALTH CONDITIONS**

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#### THERMAL HAZARDS

There is a heating device located in 3057, Desktop Model Studio System Furnace. Most items appear cool even when very hot. Do not assume something will be cool when it could be hot.

If you are unsure of the temperature first check the setting on the piece of equipment. If it is off, it may have just been switched off and it may still be hot. To verify the temperature either touch surface with a T/C and get a direct reading or place your hand NEAR object and attempt to detect warmth. Zetex gloves may be warranted if routinely working around hot equipment.

If you are leaving a heated piece of equipment unattended, be sure a sign warning of the thermal hazard is prominently displayed.

1. Do not open the chamber door until prompted to do so.
2. Chamber interior and metal parts may be hot, up to 200°C/392°F. Use appropriate

PPE (Personal Protective Equipment) when handling parts.

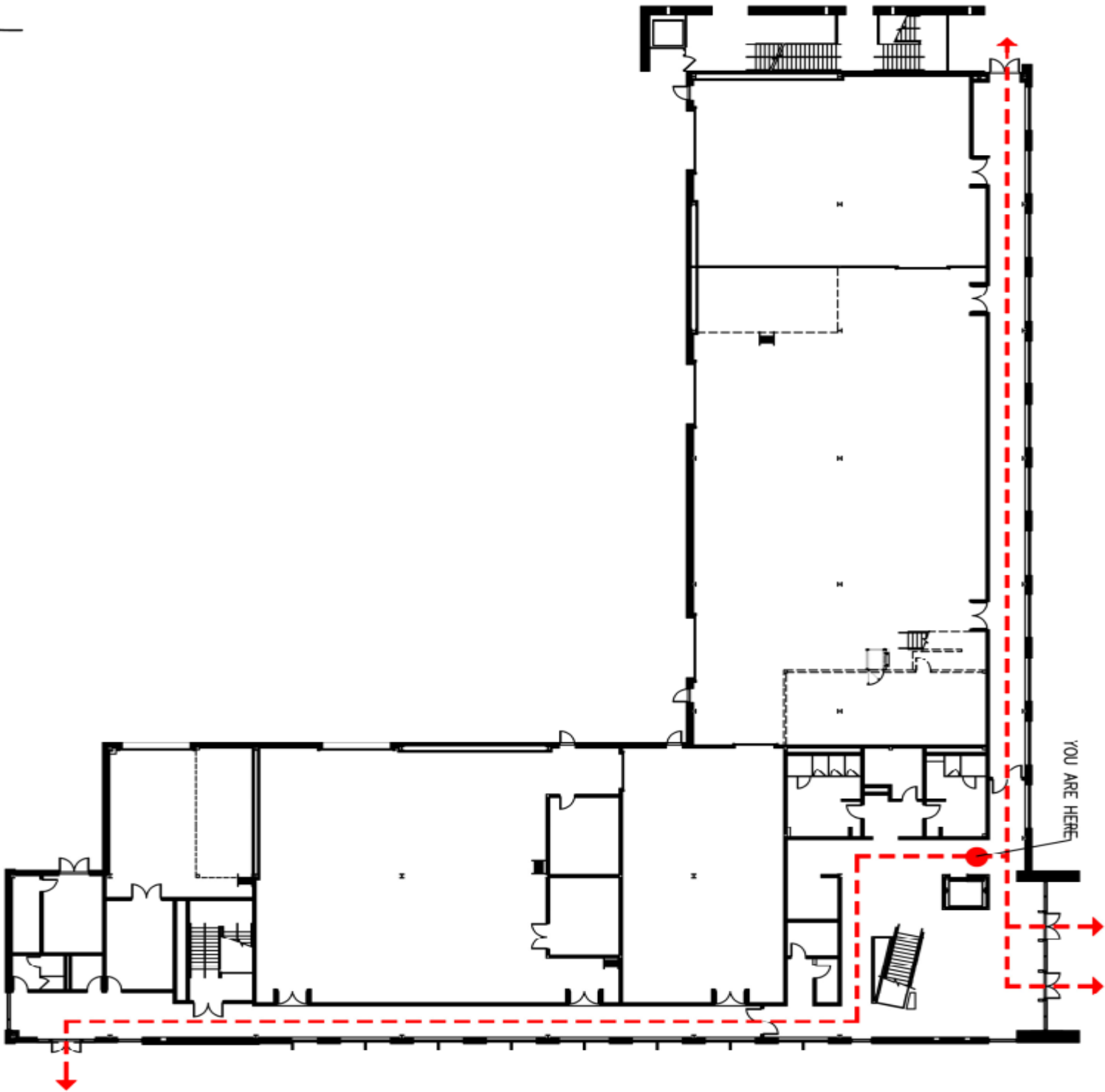
3. Never attempt to open the furnace chamber lid during the sintering process.
4. Never attempt to open the furnace lid beyond its limits.
5. Use caution when removing parts from furnace as they may be hot.
6. Use caution when removing or replacing gas canisters.
7. Do not touch or break insulation.
8. Do not handle insulation dust until all safety precautions have been read and understood.
9. Do not lean on or push the furnace other than with the provided handle.
10. Do not apply paint, lubricants, or other coatings to the furnace, cables, or fasteners.
11. Do not operate the furnace if the housing, power cables, or components are damaged.
12. Do not allow foreign objects or liquids to enter the unit. Never place containers with liquid on or near the unit.
13. Unit is heavy. Do not attempt to manually lift.
14. Never attempt to sinter any material other than a brown part debound with the Studio Study debinder. Any other use could impact system performance, lead to hazards or impact part quality.



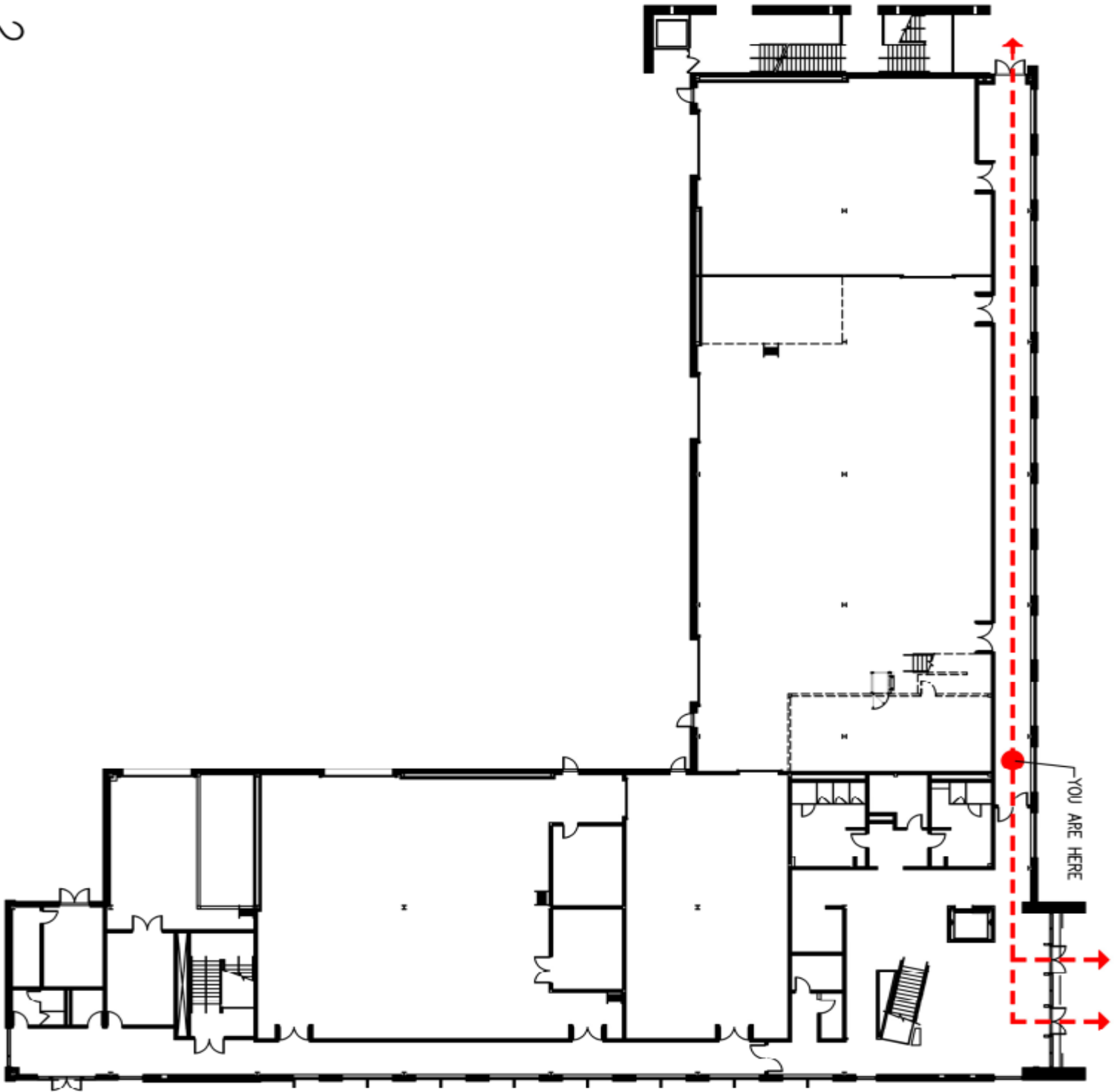


# Appendix I – COMPUTER SCIENCE AND TECHNOLOGY BUILDING EVACUATION ROUTES

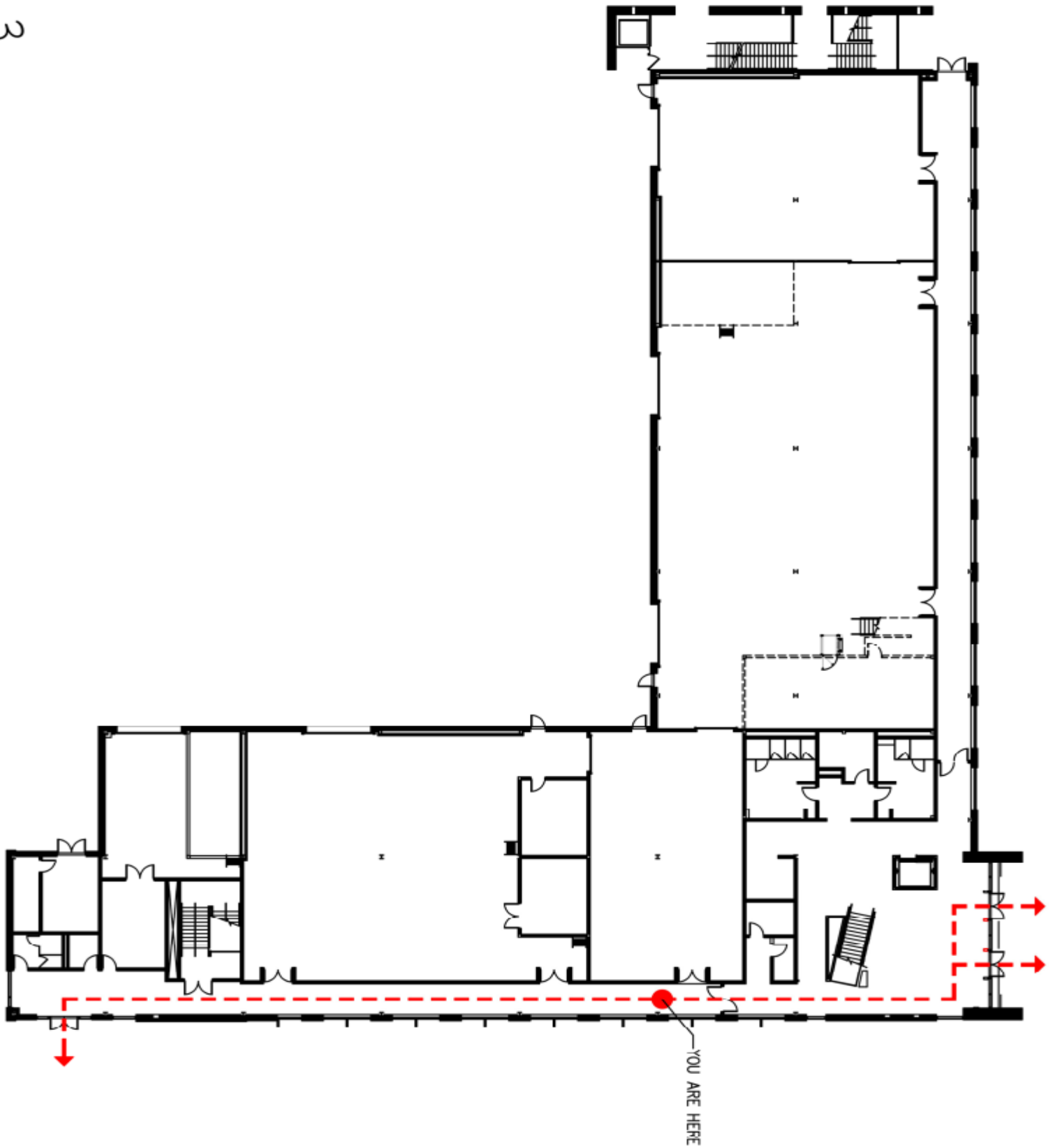
EVAC I.1



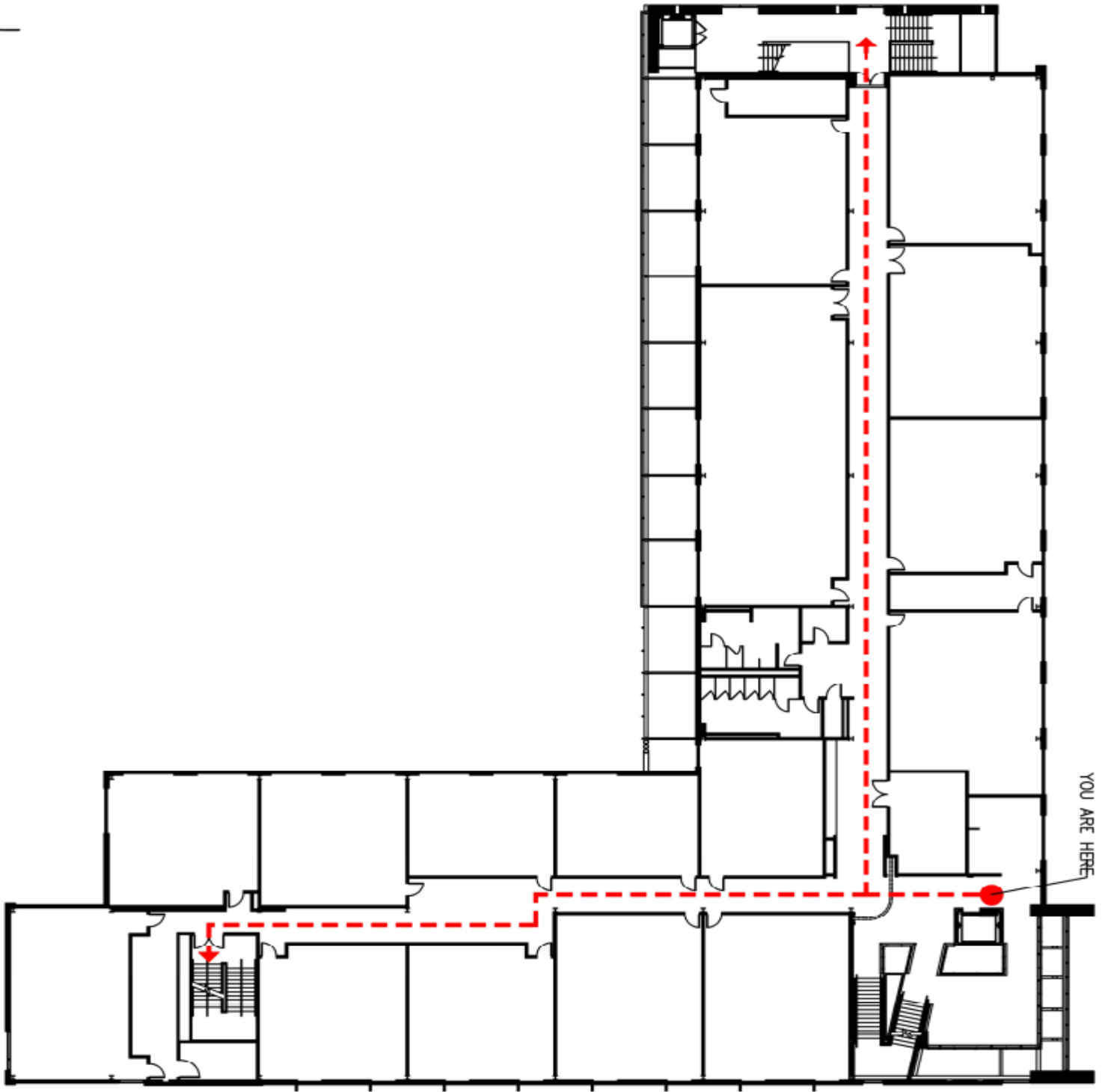
EVAC 1.2



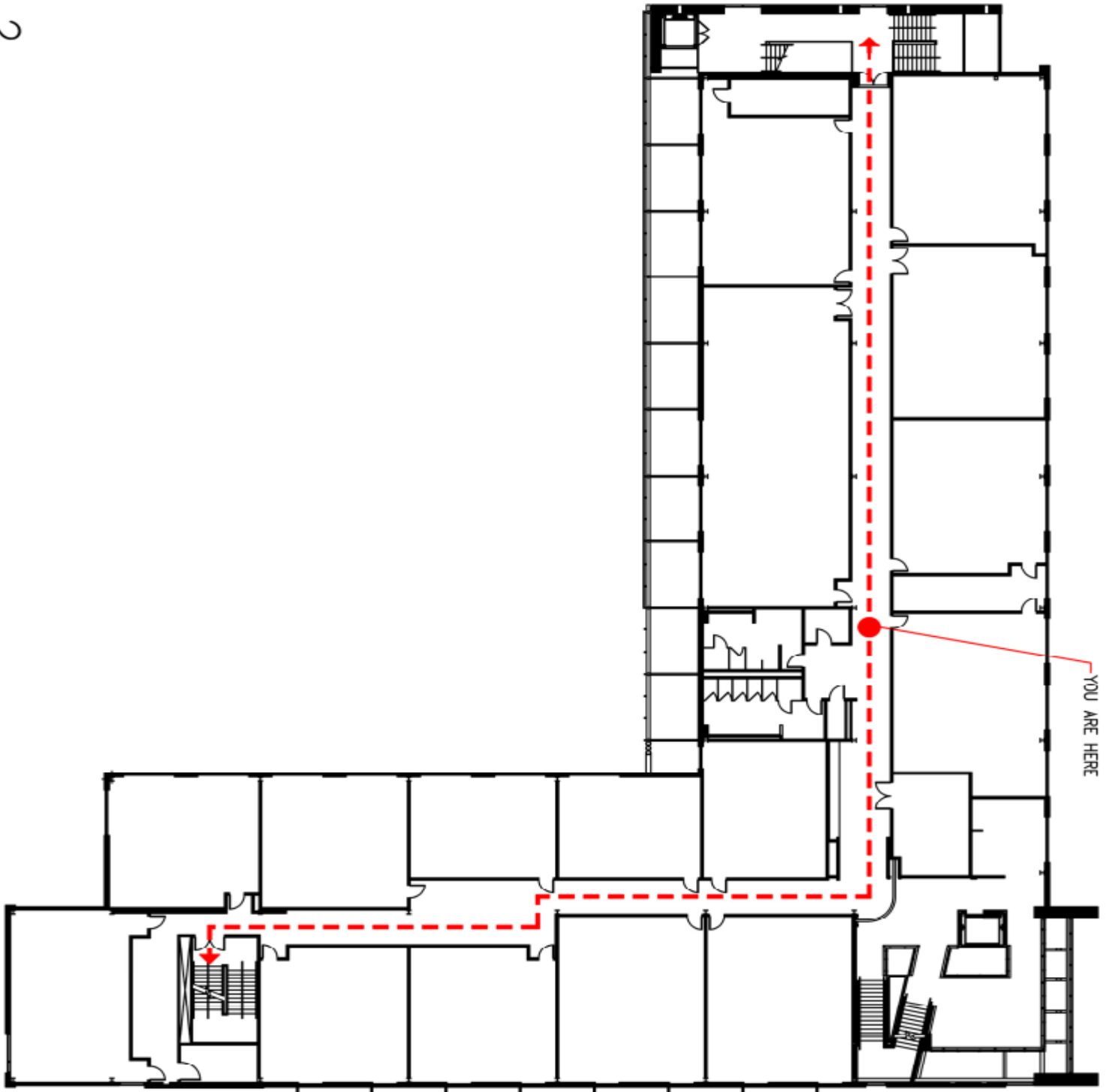
# EVAC 1.3



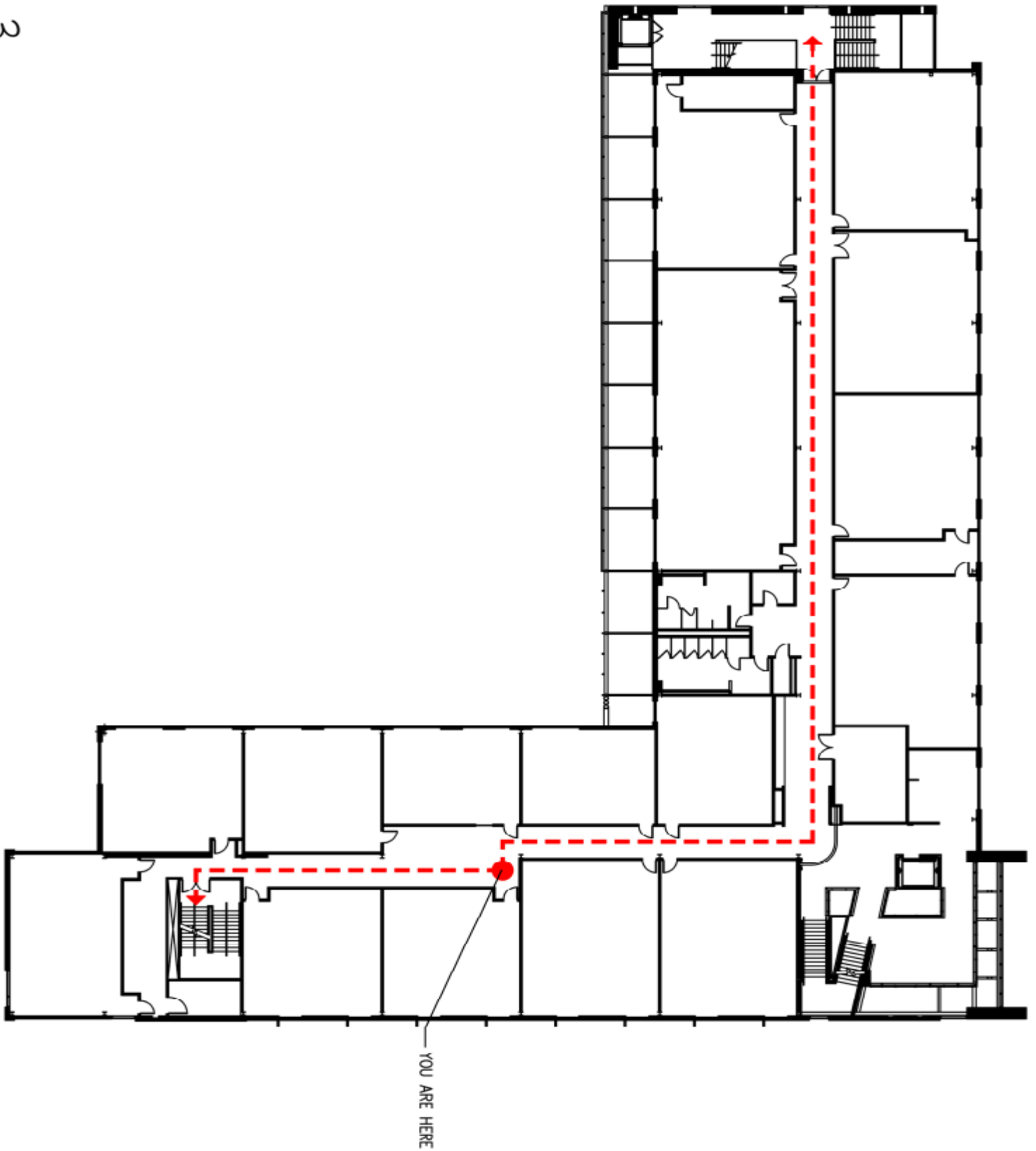
EVAC 2.1



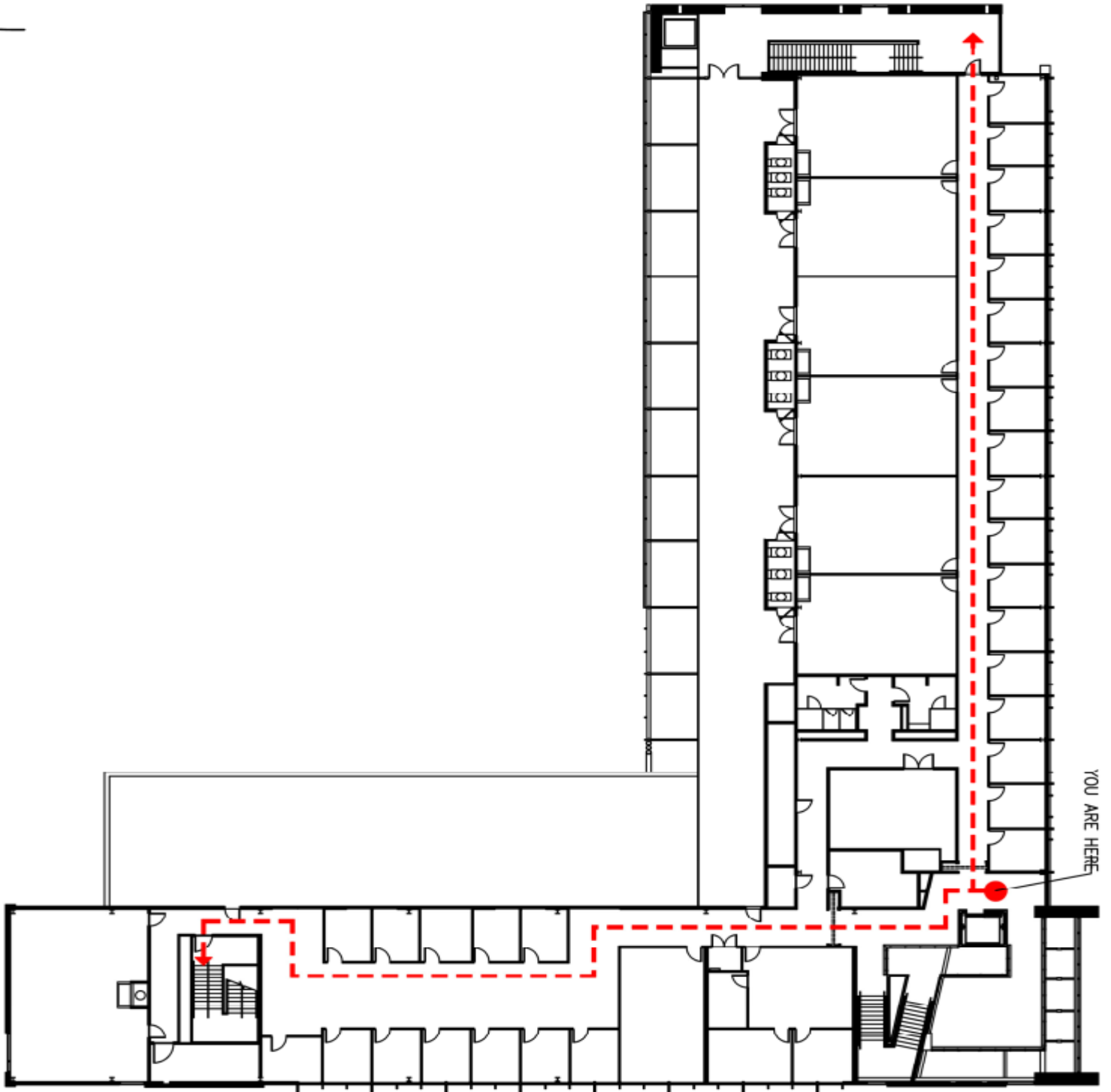
EVAC 2.2



EVAC 2.3

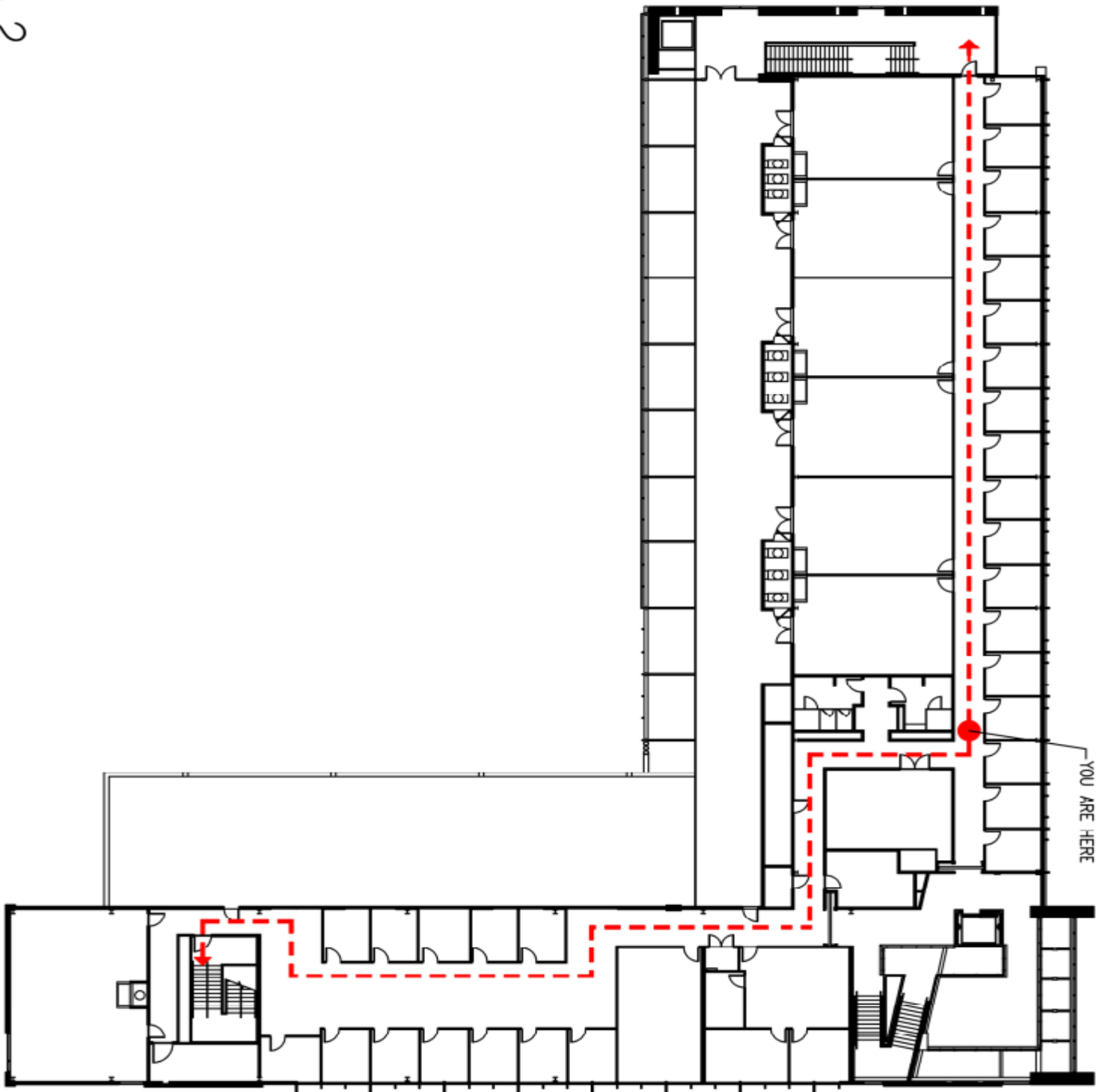


EVAC 3.1

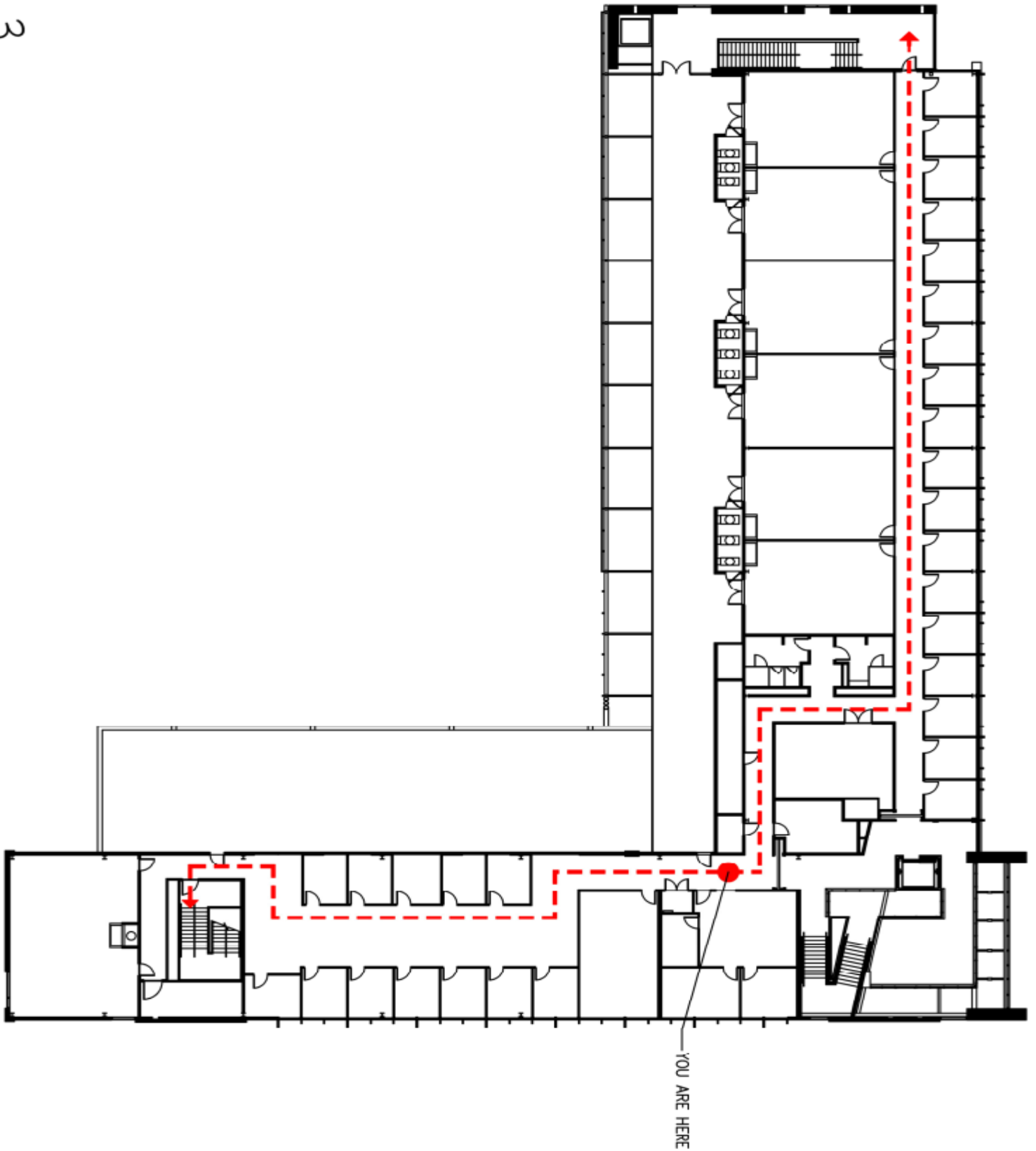




# EVAC 3.2



# EVAC 3.3



## Appendix II – Explanation of Safety Data Sheet Contents

### Hazard Communication Standard: Safety Data Sheets

The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. The information contained in the SDS is largely the same as the MSDS, except now the SDSs are required to be presented in a consistent user-friendly, 16-section format. This brief provides guidance to help workers who handle hazardous chemicals to become familiar with the format and understand the contents of the SDSs.

The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various section(s).

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., fire fighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

A description of all 16 sections of the SDS, along with their contents, is presented below:

### Section 1: Identification

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier. The required information consists of:

- Product identifier used on the label and any other common names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).<sup>1</sup>

### Section 2: Hazard(s) Identification

This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards. The required information consists of:

- The hazard classification of the chemical (e.g., flammable liquid, category<sup>1</sup>).
- Signal word.
- Hazard statement(s).
- Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame).
- Precautionary statement(s).
- Description of any hazards not otherwise classified.

- For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

## Section 3: Composition/Information on Ingredients

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed. The required information consists of:

### Substances

- Chemical name.
- Common name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the chemical.

### Mixtures

- Same information required for substances.
- The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are:
  - Present above their cut-off/concentration limits or
  - Present a health risk below the cut-off/concentration limits.
- The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:
  - A trade secret claim is made,
  - There is batch-to-batch variation, or
  - The SDS is used for a group of substantially similar mixtures.

### Chemicals where a trade secret is claimed

- A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

## Section 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical. The required information consists of:

- Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

## Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical. The required information consists of:

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

## Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard. The required information may consist of recommendations for:

- Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.
- Emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing.
- Methods and materials used for containment (e.g., covering the drains and capping procedures).
- Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up)

## Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals. The required information consists of:

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking in work areas is prohibited).
- Recommendations on the conditions for safe storage, including any incompatibilities. Provide advice on specific storage requirements (e.g., ventilation requirements)

## Section 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. The required information consists of:

- OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.
- Appropriate engineering controls (e.g., use local exhaust ventilation, or use only in an enclosed system).
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g., appropriate types of eye, face, skin or respiratory protection needed based on hazards and potential exposure).
- Any special requirements for PPE, protective clothing or respirators (e.g., type of glove material, such as PVC or nitrile rubber gloves; and breakthrough time of the glove material).

## Section 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance or mixture. The minimum required information consists of:

- Appearance (physical state, color, etc.);
- Upper/lower flammability or explosive limits;
- Odor;
- Vapor pressure;
- Odor threshold;
- Vapor density;
- pH;
- Relative density;
- Melting point/freezing point;
- Solubility(ies);
- Initial boiling point and boiling range;
- Flash point;
- Evaporation rate;
- Flammability (solid, gas);
- Partition coefficient: n-octanol/water;
- Auto-ignition temperature;
- Decomposition temperature; and
- Viscosity.

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust's explosive potential

## Section 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other. The required information consists of:

### **Reactivity**

- Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

### **Chemical stability**

- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.
- Description of any stabilizers that may be needed to maintain chemical stability.
- Indication of any safety issues that may arise should the product change in physical appearance.

### **Other**

- Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.
- List of all conditions that should be avoided (e.g., static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).
- List of all classes of incompatible materials (e.g., classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.

- List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating. (Hazardous combustion products should also be included in Section 5 (Fire-Fighting Measures) of the SDS.)

## Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data are not available. The required information consists of:

- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.
- Description of the delayed, immediate, or chronic effects from short- and long-term exposure.
- The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (median lethal dose)) - the estimated amount [of a substance] expected to kill 50% of test animals in a single dose.
- Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.
- Indication of whether the chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or found to be a potential carcinogen by OSHA

## Section 12: Ecological Information (non-mandatory)

This section provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment. The information may include:

- Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g., acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).
- Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.
- Results of tests of bioaccumulation potential, making reference to the octanol-water partition coefficient (Kow) and the bioconcentration factor (BCF), where available.
- The potential for a substance to move from the soil to the groundwater (indicate results from adsorption studies or leaching studies).
- Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).

## Section 13: Disposal Considerations (non-mandatory)

This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS. The information may include:

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities

## Section 14: Transport Information (non-mandatory)

This section provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea. The information may include:

- UN number (i.e., four-figure identification number of the substance)<sup>1</sup>.
- UN proper shipping name<sup>1</sup>.
- Transport hazard class(es)<sup>1</sup>.
- Packing group number, if applicable, based on the degree of hazard<sup>2</sup>.
- Environmental hazards (e.g., identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code)).
- Guidance on transport in bulk (according to Annex II of MARPOL 73/78<sup>3</sup> and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code (IBC Code))).
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available).

## Section 15: Regulatory Information (non-mandatory)

This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS. The information may include:

- Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations)

## Section 16: Other Information

This section indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here.

### Employer Responsibilities


Employers must ensure that the SDSs are readily accessible to employees for all hazardous chemicals in their workplace. This may be done in many ways. For example, employers may keep the SDSs in a binder or on computers as long as the employees have immediate access to the information without leaving their work area when needed and a back-up is available for rapid access to the SDS in the case of a power outage or other emergency. Furthermore, employers may want to designate a person(s) responsible for obtaining and maintaining the SDSs. If the employer does not have an SDS, the employer or designated person(s) should contact the manufacturer to obtain one.




# PPE HAZARD ASSESSMENT FORM

<b>I am reviewing (check the appropriate box):</b>	A worksite	Specify location:
	A single employee's job description	Name of employee:
		Position Title:
A job description for a class of employees	Position Titles: Location:	

<b>Your Name:</b>	<b>Department/Division:</b>	<b>Date:</b>
-------------------	-----------------------------	--------------

	<b>EYE HAZARDS:</b> Tasks that can cause eye injury include: working with chemicals or acids; UV lights; chipping, sanding, or grinding; welding; furnace operations; and metal and wood working.		
	<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
	Chemical Exposure		
	High Heat/Cold		
	Dust/Flying Debris		
	Impact		
	UV/IRRadiation		
	Other:		

	<b>HEAD/NECK/FACE HAZARDS:</b> Tasks that can cause head/neck/face injury include: working below other workers who are using tools or materials that could fall, working on energized electrical equipment or utilities, and working in trenches or confined spaces.		
	<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
	Chemical Exposure		
	Dust/Flying Debris		
	Impact		
	UV/IR Radiation		
	Electrical Shock		
Other:			

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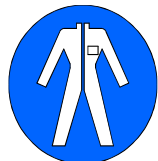
**FOOT HAZARDS:** Tasks that can cause foot injury include: exposure to chemicals or acids, welding or cutting, materials handling, renovation or construction, and electrical work.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Chemical Exposure		
High Heat/Cold		
Impact/Compression		
Electrical		
Puncture		
Slippery/Wet Surfaces		
Other:		



**HAND HAZARDS:** Hand injury can be caused by: work with chemicals or acids, exposure to cut or abrasion hazards (for example, during demolition, renovation, woodworking, or food service preparation), work with very hot or cold objects or materials, and exposure to sharps.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Chemical Exposure		
High Heat/Cold		
UV/IR Radiation		
Electrical Shock		
Puncture		
Cuts/Abrasion		
Other:		



**BODY HAZARDS:** Injury of the body (torso, arms, or legs) can occur during: exposure to chemicals, acids, or other hazardous materials; abrasive blasting; welding, cutting, or brazing; chipping, sanding, or grinding; use of chainsaws or similar equipment; and work around electrical arcs.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Chemical Exposure		
High Heat/Cold		
Impact/Compression		
Electrical Arc		
Cuts/Abrasion		

	Other:		



**FALL HAZARDS:** Personnel may be exposed to fall hazards when performing work on a surface with an unprotected side or edge that is 4 feet or more above a lower level, or 10 feet or more on scaffolds. Fall protection may also be required when using vehicle man lifts, elevated platforms, tree trimming, performing work on poles, roofs, or fixed ladders.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Fall hazard		



**NOISE HAZARDS:** Personnel may be exposed to noise hazards when working in mechanical rooms; machining; grinding; sanding; cage washing; dish washing; working around pneumatic equipment, grounds equipment, generators, chillers, motors, saws, jackhammers, or similar equipment.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Noise hazard		



**RESPIRATORY HAZARDS:** Personnel may be exposed to respiratory hazards that require the use of respirators: during emergency response, when using certain chemicals outside of a chemical fume hood; when working with hazardous powders; when entering fume hood plenums, when working with animals; when applying paints or chemicals in confined spaces; when welding, cutting, or brazing on certain metals; and when disturbing asbestos, lead, silica, or other particulate hazards.

<i>Check the appropriate box for each hazard:</i>	<i>Description of hazard(s):</i>	<i>Required PPE</i>
Chemical exposure		
Particulate exposure		
Other:		

I certify that the above hazard assessment was performed to the best of my knowledge and ability, based on the hazards present on this date.  
 \_\_\_\_\_ (signature)

## Appendix IV: Good Catch Observation

FACULTY/STAFF     STUDENT

Below is a short "Good Catch" form that can be used by any employee who experiences or observes any of the following:

- **Unsafe condition** – Identified as a working condition or deficiency with potential to physically harm an employee **AND/OR**
- **Unsafe act** - An act that deviates from generally recognized safe processes or specified methods of doing a job and increases the probability of an accident. **AND/OR**
- **An observed incident** where no property was damaged and no personal injury was sustained, but where given a slight shift in time or position, damage and/or injury easily could have occurred.

**SECTION A - OBSERVING EMPLOYEE TO COMPLETE (1-3):** Simply fill-in observation information below and return by email or deliver to **INPUT WHO TO SUBMIT TO**.

Good Catches will be reviewed by the CSIT OSHE DEPARTMENT (or could be Campus Safety if they agree).

1. Date and Time of GOOD CATCH:

1a. Installation/Command/Organization:

1b. Building and location where the Good Catch was/is observed:

2. Area Supervisor's Name if applicable (Optional):

Last Name:

First Name:

Phone Number:

3. Briefly describe the hazard which exists including the approximate number of employees exposed to or threatened by such hazard (use extra paper, if needed).

### SECTION B. OBSERVER (1-4)

1. Last Name:

First Name:

2. Email Address:

3. Phone Number:

4. May your name be revealed?

Yes

No

### Section C. Safety TO COMPLETE

1. Type of Good Catch observation:

Near Miss

Unsafe Act

Unsafe Condition

2. Standard Violated (if any):

3. Incident Factor:

a. Training:

Yes

No

b. Personal Protective Equipment:

Yes

No

c. List other factors:

4. Recommended Action for Interim Control(s):

5. Recommended Supervisor for Corrective Action(s):

6. Good Catch Status:

initiated

Open

Response Required

Closed

**A. Instructions for employees filling-in “Good Catch” form (Section A**

**items 1-3):** 1. Enter the date and time of when the Good Catch was identified.

1a. Enter the location where the Good Catch was observed.

1b. Enter the building and exact location where the Good Catch was observed.

2. Enter the area Supervisor’s name and phone number if applicable (Optional).

3. Briefly describe the hazard.

**B. Observers Information (Section B Items 1-4)**

1. Enter your name.

2. Enter your email address.

3. Enter your phone number.

4. Check applicable box to indicate whether your name may be revealed.

**C. EHS Department to complete information (Section C items 1-6):**

1. Enter type of Good Catch report:

Observed incident

Unsafe Act

Unsafe Condition

2. Standard Violated:

3. Incident Factor:

Training

Personal Protective Equipment (PPE)

Other factors

4. Enter recommended action for interim control(s).

5. Enter supervisor’s corrective action if applicable.

6. Enter Good Catch Status:

Initiated

Open

Response Required

Closed

## Appendix V: Eyewash Stations Checklist

- Controlled, low velocity flow completely rinses eyes and face and is not injurious to user.
- Water flow is sufficiently high to allow user to hold eyes open while rinsing.
- Spray heads are protected from airborne contaminants. Covers are removed by water flow.
- Unit delivers at least 3.0 gallons (11.4 liters) of water per minute for 15 minutes.
- Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction.
- Hands-free stay-open valve activates in one second or less.
- Valve actuator is easy to locate and readily accessible to user.
- Unit washes both eyes simultaneously. Water flow covers area indicated on Guardian test gauge at no more than 8" above spray heads.

### Locations of Eyewash Stations in CSTB.

#### Rooms

- |                               |                               |                               |
|-------------------------------|-------------------------------|-------------------------------|
| <input type="checkbox"/> 1005 | <input type="checkbox"/> 3005 | <input type="checkbox"/> 3008 |
| <input type="checkbox"/> 1018 | <input type="checkbox"/> 3006 | <input type="checkbox"/> 3009 |
| <input type="checkbox"/> 2006 | <input type="checkbox"/> 3007 | <input type="checkbox"/> 3010 |

## Appendix VI: Safety Stations Checklist

- Water supply delivers required flow when shower and eye or eye/face wash are operated simultaneously.
- Hands-free stay-open valve activates in one second or less.
- Height of water column is between 82" (208.3 cm) and 96" (243.8 cm) above the floor.
- Shower delivers 20 gallons (75.7 liters) of water per minute for 15 minutes in the required pattern.
- Easily located, accessible actuator is no more than 69" (173.3 cm) above floor.
- Center of the water pattern is at least 16" (40.6 cm) from any obstruction.
- At 60" (152.4 cm) above the floor, the water pattern is at least 20" (50.8 cm) in diameter.
- Spray heads are protected from airborne contaminants. Covers are removed by water flow.
- Unit delivers at least 3.0 GPM (11.4 liters) (for eye/face wash) or 0.4 GPM (1.5 liters) (for eyewash) for 15 minutes.
- Hands-free stay-open valve activates in one second or less.
- Valve actuator is easy to locate and readily accessible to user.
- Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction.

### Locations of Eyewash Stations in CSTB.

#### Rooms

- 1006
- 1018
- 2005
- 3057

## Appendix VII: Emergency Shower Checklist

- Water supply is sufficient to provide at least 20 GPM for 15 minutes.
- Hands-free valve activates in one second or less and remains open until manually closed.
- Shower delivers 20 gallons (75.7 liters) of water per minute for 15 minutes in the required pattern.
- Height of water column is between 82" (208.3 cm) and 96" (243.8 cm) above the floor.
- Center of the water pattern is at least 16" (40.6 cm) from any obstruction.
- Easily located, accessible actuator is no more than 69" (173.3 cm) above floor.
- At 60" (152.4 cm) above the floor, the water pattern is at least 20" (50.8 cm) in diameter.
- If provided, shower enclosure has a minimum diameter of 34" (86.4 cm).

### Locations of Emergency Showers in CSTB.

#### Rooms

- Outside 3006-3007
- Outside 3008-3008



## Appendix VIII: EYE AND FACE PROTECTOR SELECTION GUIDE

This information is intended to aid in identifying and selecting the types of eye and face protectors that are available, their capabilities and limitations for the hazards listed. Care should be taken to recognize the possibility of multiple and simultaneous hazard exposures and the chosen protector(s) should be able to protect against the highest level of each hazard. Some protectors may not be compatible with other personal protective equipment when worn together. The end user needs to carefully match protectors with other personal protective equipment to provide the protection intended. Protectors are generally available in a variety of styles and sizes and care should be taken to ensure that the right size is selected for a particular person ensuring comfort and proper fit. Protectors that fit poorly will not afford the protection for which they were designed.

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<b>IMPACT - Chipping, grinding, machining, masonry work, riveting, and sanding</b>			
<b>Flying fragments, objects, large chips, particles, sand, dirt, etc.</b>	<ul style="list-style-type: none"> <li>• Spectacles with side protection</li> <li>• Goggles with direct or indirect ventilation</li> <li>• Faceshield worn over spectacles or goggles</li> <li>• Welding helmet worn over spectacles or goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirators</li> </ul>	<p>Caution should be exercised in the use of metal frame protective devices in electrical hazard areas. Metal frame protective devices could potentially cause electrical shock and electrical burn through contact with, or thermal burns from exposure to the hazards of electrical energy, which include radiation from accidental arcs.</p> <p>To provide adequate protection, ensure goggles fit tightly to the face.</p> <p>Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.</p>	<p>Impact rated:  <b>+</b> (spectacle lens)  <b>Z87+</b> (all other lens)  <b>Z87+</b> (plano frame)  <b>Z87-2+</b> (Rx frame)</p>
<b>HEAT - Furnace operations - pouring, casting, hot dipping, gas cutting, and welding</b>			
<b>Hot sparks</b>	<ul style="list-style-type: none"> <li>• Spectacles with side protection</li> <li>• Goggles with direct or indirect ventilation</li> <li>• Faceshield worn over spectacles or goggles</li> <li>• Loose-fitting respirator worn over spectacles</li> <li>• Full-facepiece respirator</li> </ul>	<p>Spectacles, cup and cover type goggles do not provide unlimited facial protection.</p> <p>Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.</p>	<p>NOTE: There are currently no marking designations for eye protection to heat or high-temperature exposure in the ANSI/ISEA Z87.1-2020 standard.</p>
<b>Splash from molten metal</b>	<ul style="list-style-type: none"> <li>• Faceshield worn over goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirator</li> </ul>		

Hazard	Protectors	Limitations	Marking <sup>1</sup>
High temperature exposure	<ul style="list-style-type: none"> <li>• Screen faceshield over spectacles or goggles</li> <li>• Reflective faceshield over spectacles or goggles</li> </ul>		
<b>CHEMICAL – Liquids, acid and chemical handling, degreasing, plating.</b>			
Splash, droplets and sprays	<ul style="list-style-type: none"> <li>• Goggles with indirect ventilation (eyecup or cover type)</li> <li>• Faceshield worn over goggles)</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirator</li> </ul>	<p>Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.</p> <p>To provide adequate protection, ensure goggles fit tightly to the face.</p>	Splash/droplet: <b>D3</b>
Irritating Mist	<ul style="list-style-type: none"> <li>• Goggle with no ventilation (cover type)</li> <li>• Faceshield worn over goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirator</li> </ul>	<p>Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.</p> <p>To provide adequate protection, ensure goggles fit tightly to the face.</p>	NOTE: There are currently no marking designations for eye protection to Irritating mists exposure in the ANSI/ISEA Z87.1-2020 standard.
<b>DUST - Woodworking, buffing, general dusty conditions</b>			
Nuisance dust	<ul style="list-style-type: none"> <li>• Goggles with direct or indirect ventilation (eyecup or cover type)</li> <li>• Full-facepiece respirator</li> </ul>	<p>Atmospheric conditions and the restricted ventilation of a protector can cause lenses to fog. Frequent cleaning may be required.</p> <p>To provide adequate protection, ensure goggles fit tightly to the face.</p>	Dust: <b>D4</b>
Fine dust	<ul style="list-style-type: none"> <li>• Goggles with indirect ventilation or no ventilation</li> <li>• Full-facepiece respirator</li> </ul>	To provide adequate protection, ensure goggles fit tightly to the face.	Fine dust: <b>D5</b>
<b>OPTICAL RADIATION</b>			
Infrared Radiation (IR)	<ul style="list-style-type: none"> <li>• Spectacles with side protection</li> <li>• Goggles with direct or indirect ventilation</li> <li>• Faceshield worn over spectacles or goggles</li> <li>• Welding helmet worn over spectacles or goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirators</li> </ul>	<p>For proper fit of protector; there shall be no penetration of direct infrared spectra light in all non-lens areas.</p> <p>Side shields shall have filtering capability equal to or greater than the front lenses.</p>	IR: <b>R</b> and scale number

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<b>Visible Light (Glare)</b>	<ul style="list-style-type: none"> <li>• Spectacles with side protection</li> <li>• Goggles with direct or indirect ventilation</li> <li>• Faceshield worn over spectacles or goggles</li> <li>• Welding helmet worn over spectacles or goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirators</li> </ul>	<p>For proper fit of protector; there shall be no penetration of direct visible light in all non-lens areas.</p> <p>Sideshields shall have filtering capability equal to or greater than the front lenses.</p>	Visible: <b>L</b> and <i>scale number</i>
<b>Ultraviolet Radiation (UV)</b>	<ul style="list-style-type: none"> <li>• Spectacles with side protection</li> <li>• Goggles with direct or indirect ventilation</li> <li>• Faceshield worn over spectacles or goggles</li> <li>• Welding helmet worn over spectacles or goggles</li> <li>• Loose-fitting respirator worn over spectacles or goggles</li> <li>• Full-facepiece respirators</li> </ul>	<p>For proper fit of protector; there shall be no penetration of direct ultraviolet light in all non-lens areas</p> <p>Sideshields shall have filtering capability equal to or greater than the front lenses.</p>	UV: <b>U</b> and scale number
<b>Lasers</b>	Refer to ANSI Z136.1-2014 “Safe Use of Lasers”, for guidance in choosing the correct protective eyewear when working with lasers.		NOTE: There are currently no marking designations for eye protection to Lasers in the ANSI/ISEA Z87.1-2020 standard.
<b>Electric Arcs</b>	Refer to NFPA 70E-2018 “Standard for Electrical Safety in the Workplace”, for guidance in choosing the correct protective eyewear when working on electrical equipment.	Only faceshields provide compliant eye and face protection, worn over protective spectacles.	NOTE: There are currently no marking designations for eye protection to electrical arcs in the ANSI/ISEA Z87.1-2020 standard.

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<p><b>Arc Welding: Arc</b></p> <p>Process Examples: Shielded Metal Arc Welding (SMAW)</p> <p>Gas Metal Arc Welding (GMAW)</p> <p>Gas Tungsten Arc Welding (GTAW)</p> <p>Air Carbon Arc Welding (CAC-A)</p> <p>Carbon Arc Welding (CAW)</p> <p>Plasma Arc Welding (PAW)</p> <p>Plasma Arc Cutting (PAC)</p> <p>Viewing electric arc furnaces and boilers.</p>	<ul style="list-style-type: none"> <li>• Welding helmet over spectacles or goggles</li> <li>• Handshield over spectacles or goggles</li> <li>• Welding Respirator</li> <li>• TYPICAL FILTER LENS SHADE: 10-14</li> </ul>	<p>Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance.</p> <p>For proper fit of protector; there shall be no penetration of direct visible light in all non-lens areas.</p> <p>Sideshields shall have filtering capability equal to or greater than the front lenses. Welding helmets are intended to shield the eyes and face from optical radiation, heat, and impact. Welding helmets should not be used as stand-alone protective devices and should be worn in conjunction with goggles or spectacles.</p> <p>Filter lens shade selection is to be made based on the welding process, arc current, electrode size and/or plate thickness. Use ANSI Z49.1:2012, Table 1, Guide for Shade Numbers, to select the proper filter lens shade for both protection and comfort (reduction in visible glare).</p> <p><b>Note:</b> Filter lenses shall meet the requirements for shade designations in table 7 of ANSI/ISEA Z87.1-2020.</p>	<p>Welding: <b>W</b> shade number UV: <b>U</b> scale number Visible: <b>L</b> scale number IR: <b>R</b> scale number Variable tint: <b>V</b> Special purpose: <b>S</b></p>

Hazard	Protectors	Limitations	Marking <sup>1</sup>
<b>Oxyfuel Gas Welding:</b>  Process Examples: Oxyfuel Gas Welding (OFW)  Viewing gas-fired furnaces and boilers	<ul style="list-style-type: none"> <li>• Welding goggles</li> <li>• Welding helmet over spectacles or goggles</li> <li>• Welding faceshield over spectacles or goggles</li> </ul> TYPICAL FILTER LENS SHADE: 6 -8	Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance.  For proper fit of protector; there shall be no penetration of direct visible light in all non-lens areas.  Sideshields shall have filtering capability equal to or greater than the front lenses.  Welding helmets are intended to shield the eyes and face from optical radiation, heat, and impact. Welding helmets should not be used as stand-alone protective devices and should be worn in conjunction with goggles or spectacles  Filter lens shade selection is to be made based on the welding process, arc current, electrode size and/or plate thickness. Use ANSI Z49.1:2012, Table 1, Guide for Shade Numbers, to select the proper filter lens shade for both protection and comfort (reduction in visible glare).	Welding: <b>W</b> <i>shade number</i> UV: <b>U</b> <i>scale number</i> Visible: <b>L</b> <i>scale number</i> IR: <b>R</b> <i>scale number</i> Variable tint: <b>V</b> Special purpose: <b>S</b>
<b>Oxyfuel or Oxygen Cutting</b>	<ul style="list-style-type: none"> <li>• Welding goggles</li> <li>• Welding helmet over spectacles or goggles</li> <li>• Welding faceshield over spectacles or goggles</li> </ul> TYPICAL FILTER LENS SHADE:3-6	<b>Note:</b> Filter lenses shall meet the requirements for shade designations in table 7 of ANSI/ISEA Z87.1-2020.	
<b>Torch brazing</b>	<ul style="list-style-type: none"> <li>• Welding goggles</li> <li>• Welding helmet over spectacles or goggles</li> <li>• Welding faceshield over spectacles or goggles</li> </ul> TYPICAL FILTER LENS SHADE: 3-4		
<b>Torch soldering</b>	<ul style="list-style-type: none"> <li>• Spectacles</li> <li>• Welding faceshield over spectacles</li> </ul> TYPICAL FILTER LENS SHADE: 2	Shade or special purpose lenses, as suitable. <b>Note:</b> Refer to definition of special purpose lenses in ANSI/ISEA Z87.1-2020.	
<b>Glare</b>	<ul style="list-style-type: none"> <li>• Spectacles with or without side protection</li> <li>• Faceshield over spectacles or goggles.</li> </ul>		

1. Refer to ANSI/ISEA Z87.1-2020 Table 3 for complete marking requirements.

2. Refer to ANSI Z49.1: 2012: "Safety in Welding, Cutting, and Allied Processes", Table 1, Guide for Shade Numbers, to select the proper lens filter protective shade based on welding process, arc current (in amperes), Electrode Size (arc welding only) and metal plate thickness (for oxyfuel and oxygen cutting only).

3. Refer to ANSI Z136.1-2014 "Safe Use of Lasers", for guidance on choosing the correct protective eyewear when working with lasers.

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Injury	University Police	2222
Question concerning minor injury	University Health Center	2241
Minor Chemical Spill	Laboratory Coordinator	3310
Major Chemical Spill	University Police & Environmental Health and Safety & Laboratory Coordinator	2222 & 2157 & 3310
Missing Lab Materials	Laboratory Coordinator	3310
Safety Question	Environmental Health and Safety	2157
Emergency Chemical Information	CHEMTREC	9-1-800-424-9300
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Equipment Malfunction	Laboratory Coordinator	3310
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