

Laboratory Safety Manual

**Program for Semiconductor Product Engineering
Testing Lab**

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Emergency Guidance

Emergency Contact Information

TTU Police Department	
Emergency	9-911
Non-Emergency	742-3931

TTU Environmental Health and Safety (EH&S)		
Daytime Emergencies	M-F, 8:00AM – 5:00 PM	742-2876
Non-Emergency	Anytime	742-3931

After an emergency is reported, contact:

Principal Investigator: Richard Gale	
Office Number	ECE 236

Primary	(806) 535-9576
Office Phone	(806) 834-0007
Email	richard.gale@ttu.edu

Department Safety Officer: Richard Woodcock	
Office Number	ECE 002
Primary	(806) 834-3095
Office Phone	(806) 470-9290
Email	richard.woodcock@ttu.edu

Lab Manager: Kenyan Burnham	
Primary	(806) 319-2773
Email	kenyan.burnham@ttu.edu

Emergency Response Equipment

All members of the lab should be aware of the location of first aid equipment for any potential hazards that may cause bodily injury, chemical exposure, or medical emergency.

All TTU laboratories are equipped with emergency response equipment. The following equipment is in 252:

- **100-person First Aid Kit**

In addition, a fire extinguisher is located down the hallway outside of 252.

The stairway located outside of 252 and 253 is the designated exit for any emergency.

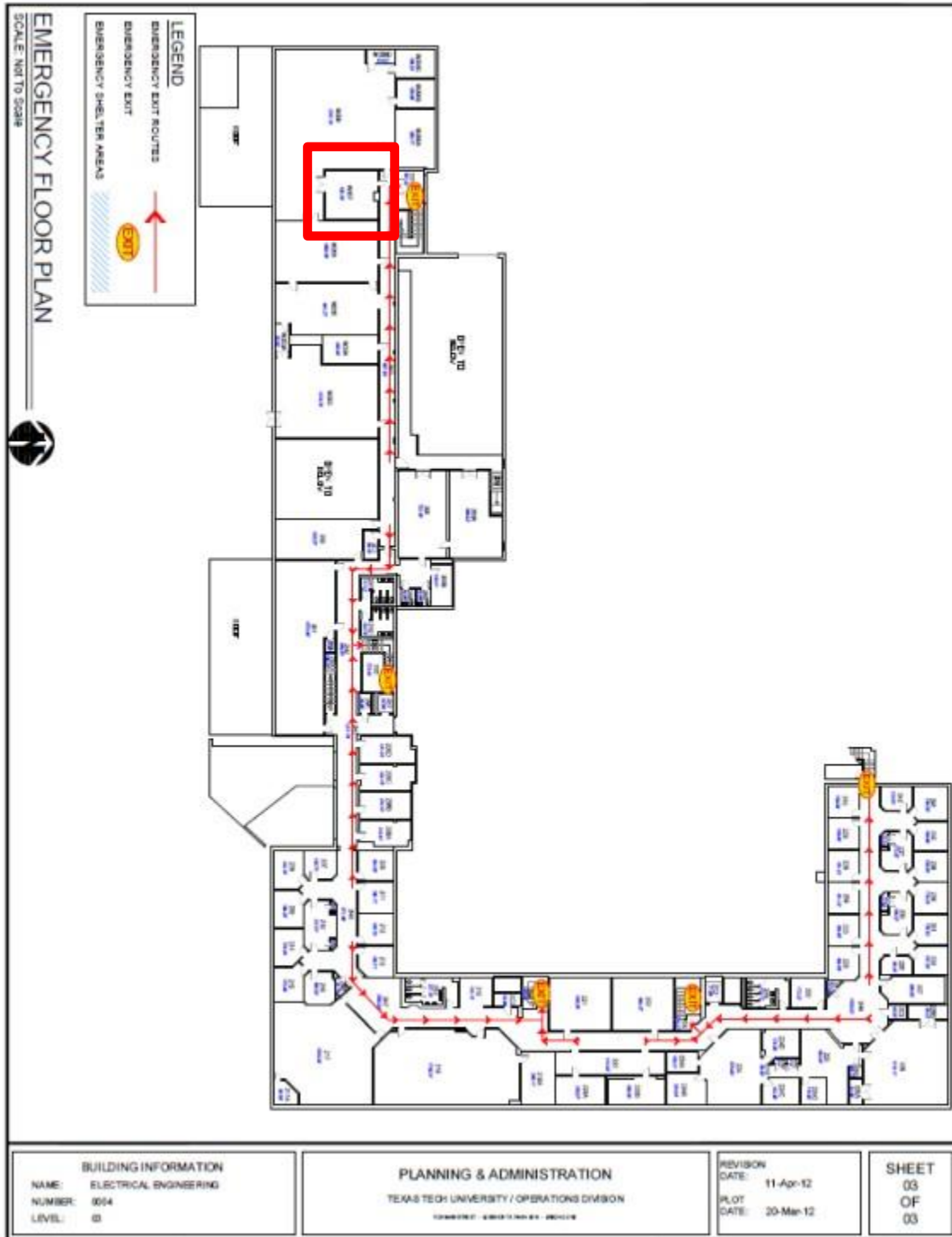


Figure (1). Location of 252

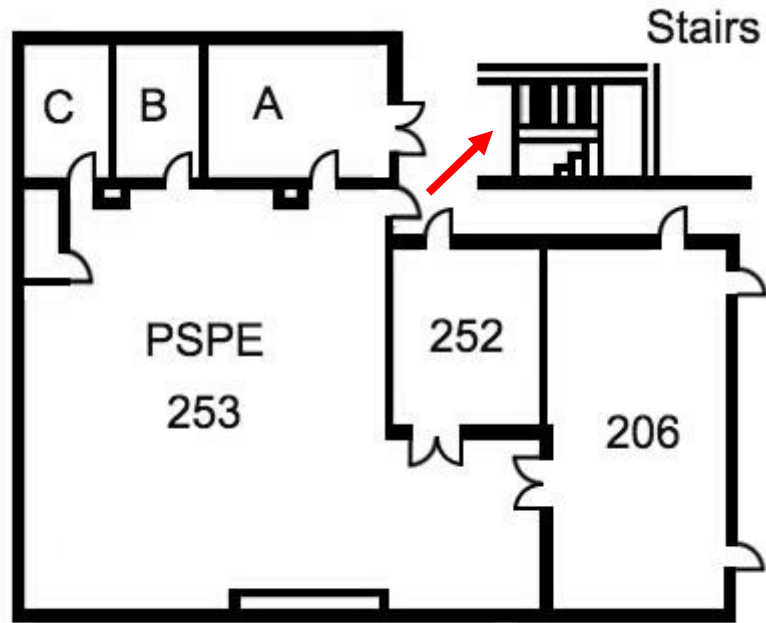


Figure (2). Layout of PSPE Lab 252

Each Department has a DOSMA (*Designated Outside Safe Meeting Area*). This area is designed to remove individuals from any present danger from any emergency.



Figure (3). Location of DOSMAs

For the Department of Electrical and Computer Engineering the DOSMAs are:

- **East of the building on the Engineering Key.**
- **The far West end of the parking lot located near the Linda and Terry Fuller Track and Field Complex.**
- **South of the building on the open arcade.**

General Emergency Guidance

If there is an emergency or threat, leave the laboratory immediately and call 911.

The DOSMA for lab 252 and the 253 workspace is to the West adjacent to the Linda and Terry Fuller Track and Field Complex located behind the Electrical and Computer Engineering building.

Medical Emergency Guidance

Always call 911 when a medical emergency occurs.

Medical Emergency Response

Minor Injury	Seek to contain and seal the wound using wraps and bandages located in the medical kit.
Vapor Exposure	<p>Leave area and go outside for fresh air.</p> <p>Symptoms of any degree warrant calling 911.</p> <p>If unsure of a suitable response to a specific agent call EH&S.</p>
Exposure to liquid chemical agent	<p>Follow instructions laid out in MSDS (if available).</p> <p>Any present symptoms warrants calling 911.</p> <p>If unsure of a suitable response to a specific agent call EH&S.</p>
Machine injury	<p>Turn off the machine in every instance.</p> <p>Reduce blood loss by immediately beginning to wrap area in absorbent and containing material that may be found in the medical kit.</p> <p>If a member is separated, do not attempt to attach the severed member.</p>
	Immediately seek medical emergency assistance.

Fire Emergency Guidance

Even if one strongly suspects the alarm may be false, Texas Tech and the Fire Department assume every event is in fact real.

Fire Emergency Situation Responses

If building alarm sounds	<p>Follow all emergency shutdown procedures for your work or experiment.</p> <p>Exit the building through the nearest emergency exit.</p>
If fire is detected or suspected	<p>All occupants of the building should evacuate immediately.</p> <p>If the alarm has not been sounded, the nearest fire alarm pull station should be activated.</p>
In all cases	<p>Proceed to the DOSMA.</p> <p>The DOSMA for 252 and 253 is West adjacent to the Linda and Terry Fuller Track and Field Complex located behind the Electrical and Computer Engineering Building.</p>

Caught in smoke	Drop to hands and knees and crawl towards nearest exit.
	Hold breath as much as possible; breathe through your nose and use shirt or cloth as a filter.
Trapped in a room	Close as many doors in between you and the fire. Wet and place cloth material around and under the door to help prevent smoke from entering the room.
Clothing on fire	Direct or assist a person to roll around on the floor to smother the flames. Only drench with water if safety shower is nearby.

Electrocution Emergency Guidance

When an electrocution emergency occurs, it is important to deenergize the source before attempting to rescue the victim.

It is important to take precautions in order not to risk endangering the respondent.

Electrical Emergency Situation Responses

<p>Approach</p>	<p>Call emergency responders as soon as possible.</p> <p>If a coworker trained in electrical emergency protocols is nearby, marshal their assistance immediately.</p> <p>A coworker that has succumbed to electrical shock should be approached carefully to help ensure that the source incapacitating the victim does not harm you.</p>
<p>Examine</p>	<p>A quick look at the scene will reveal whether the victim remains in contact with the object during the electrical shock.</p> <p>Avoid nearby conductors and do not touch the victim until the electrical circuit that powers the area is de-energized.</p>

<p>De-Energize</p>	<p>If the source is a power cord, disconnect the source by pulling the plug.</p>
	<p>Using an emergency stop button is preferable, if applicable.</p>
<p>Insulate</p>	<p>If de-energizing is impossible, the victim will need to be removed from the electrical source using an insulated material to move the victim without endangering the emergency respondent.</p> <p><u>Do not, under any circumstances, use a wooden broom handle.</u> Wooden broom handles have a finish that conducts electricity.</p>
<p>Rescue</p>	<p>Do not touch electrocuted victims unless actively standing on an insulated surface with a disconnected power source.</p> <p>If there is a risk of neck injury or contingency do not remove the victim at all.</p> <p>Ensure the victim's airway is unobstructed, check pulse, and perform CPR right away if necessary.</p> <p>Use of an Automated Emergency Defibrillator (AED) is preferred.</p> <p>You should not hesitate to use the AED even if you believe doing so may make the neck injury worse.</p>

Active Shooter Emergency Guidance

If you witness an individual on campus at any time or if an individual is acting in a hostile or belligerent manner, immediately contact the Texas Tech Police (9-911) on a university phone or 911 on a mobile device.

Electrical Emergency Response

**Armed subject
outside building**

Turn off the lights. Close and lock all doors and windows.

If you can do so safely, move out of the line of fire.

Move to a core area of the building if it is safe to do so and remain there until the "all clear" instruction is given by the Texas Tech Police Department or a university authority.

If you doubt the authority that is giving you instruction do not change your status.

<p>Armed subject inside building</p>	<p>If it is at all possible, flee the area safely and avoid danger.</p> <p>Contact the TTU Police Department immediately at 743-2000 or 9-911 with your location, if possible.</p> <p>If flight is impossible, lock all doors and secure yourself in your space.</p>
	<p>Get down on the floor or under a desk and remain silent.</p> <p>Get out of the line of fire.</p> <p>Wait for the “all clear” signal from the TTU Police Department.</p>
<p>Armed subject in workplace</p>	<p>There are no procedures authorities can recommend in this situation. Do anything necessary to protect yourself and others.</p> <p>Attempt to get the word out to others and, if possible, call 743-2000 or 9-911.</p> <p>Use common sense. If hiding and fleeing is impossible, attempt to negotiate with the individual.</p> <p>Attempting to overcome an armed subject by force is a last resort and should be initiated in the most extreme of circumstances.</p>

Severe Weather and Tornado Emergency Guidance

The preferred location for shelter is in the Electrical and Computer Engineering basement rooms 01, 02, and 06.

If a tornadic weather warning is officially issued in Lubbock County the *Backup Emergency Manager, Richard Woodcock*, will immediately advise all building occupants to take shelter.

The need for shelter in the event of severe or tornadic weather may be received by one or more of the following sources:

- The TTU Alert Emergency Notification System
- NOAA Weather Station (The Specific Area Message Encoder, SAME)

General Information

Guidance statement

All laboratory personnel are responsible for following the regulations and recommendations of the University Chemical Hygiene Plan and Laboratory Safety Manual.

The Laboratory Safety Manual will be a living document that all workplace and laboratory personnel are encouraged to update and modify to create a safe and productive workplace.

This laboratory safety manual supplements the University Chemical Hygiene Plan. It is designed to emphasize key elements of the University Chemical Hygiene Plan that are important to this laboratory and workspace, and to detail specific and additional safety requirements unique to the activities of this space.

It is the ultimate responsibility of the Principle Investigator to ensure the availability of the manual to all laboratory personnel and regulatory bodies.

This document was prepared by and is curated by the current Lab Safety Captain.

Minimum Training Required

Failure to complete the minimum amount of training necessary will lead to immediate removal from the facility.

As stated by EH&S and the TTU Chemical Hygiene Plan all students, faculty, and staff are required to complete the online training on the EH&S website:

EH&S Website: <http://www.dept.ehs.ttu.edu/ehs/ehshome/training>

Locations Covered by This Manual

- **ECE Room 253**
- **ECE Laboratory 252**

Required training:

- **Laboratory Safety Training**
- **Hazard Communication Training**
- **Safety Awareness Training**

Completed certificates must be received and curated by the Laboratory Safety Captain in digital form.

**Completed course certificates may be sent to:
kenyan.burnham@ttu.edu**

Identification of Potential Hazards

The following are potential hazards throughout the lab and specific examples, resources for response and mitigation, and source references.

Potential Laboratory Hazards			
Hazard	Example	Mitigation	References
High Voltages	Greater than 50 Volts	Procedures and PPE	Equipment Operating Procedures. Emergency Guidance.
Burns	Greater than 600 degrees Fahrenheit		
Physical	Rotating machinery		

Location of Laboratory Documents

The following are all documents required by the Texas Tech University Chemical Hygiene Plan and where they may be found in Laboratory 252.

Document	Location
MSDS	Not Applicable. No chemical agents present in lab.
Chemical Inventory	Not Applicable. No chemical agents present in lab.
University Chemical Hygiene Plan	Located in Laboratory Safety Manual binder.
Laboratory Safety Manual	Located in lab 252 on workbench 6.
Training Records	Digital copies on PSPE file server, records given on request.

Minimum Required Personal Protective Equipment

The following is a list of minimum personal protective equipment requirements for lab personnel:

- Long pants.

- **Closed-toed shoes.**
- **Safety glasses while operating soldering stations.**

Responsible Personnel

Section 5 of the Texas Tech Chemical Hygiene Plan outlines the responsibilities and roles of individuals in the lab.

The following are all current responsible parties identified by this document.

Role	Responsible Party/Individual	Responsibilities
User	All lab personnel	Responsible for ensuring their own safety and the safety of others. Responsible for reading and understanding the Chemical Hygiene Plan and Laboratory Safety Manual.
Principal Investigator	Richard Gale	Ultimate responsibility for all activities in the lab.

<p>Lab Safety Captain</p>	<p>Kenyan Burnham</p>	<p>Acts as a liaison between Department Safety Officer and Principle Investigator.</p> <p>Is responsible for the ongoing improving of safety measures within the lab and enforcing of safety culture.</p> <p>Implements and updates laboratory safety policies and documentation.</p>
<p>Department Safety Officer</p>	<p>Richard Woodcock</p>	<p>Is the liaison between the Laboratory Safety Captain and EH&S.</p> <p>Provides guidance on safety-related issues and ensures compliance with the Chemical Hygiene Plan.</p>

Laboratory Operating Procedures

General Safety Policies

All Personnel

- **Must have completed the proper training before they are permitted into the lab space.**
- **Will not allow access to non-permitted personnel.**
- **Will adhere to the guidelines specified or they will be subject to immediate removal from the space.**
- **Will wear appropriate personal protective equipment when a hazard is present.**
- **Will wear safety glasses when using any soldering station or portable and stationary power tool.**
- **Will not bring consumables such as food, beverage, cosmetics, tobacco, or gum.** ○ **Unless otherwise permitted by the Principal Investigator for research purposes only.**
- **Will keep the door to the laboratory shut at all times.**
- **Will not wear headphones when working with tools or equipment in the lab.**
- **When performing research or work in the lab after normal day-time operating hours will ensure a second individual is present or near in case of an emergency.**
 - **Working individually is considered dangerous during night-time hours and it is the safety culture of the PSPE program to always have someone accountable for you in case of an emergency.**
- **Will ensure their behavior does not lead to the destruction or defacement of Texas Tech University property. Individuals suspected or apprehended will immediately be removed from the area.**

- **Will ensure no property of Texas Tech University is removed from the laboratory without the written permission of the Laboratory Safety Captain or Principal Investigator.**
- **Will not bring foreign chemicals or flammables into the lab without the express permission of the Principal Investigator or Laboratory Safety Captain.**
- **Will be responsible for maintaining the culture of good laboratory housekeeping on an ongoing basis.**

Laboratory Safety Captain, PI, and Department Chemical Hygiene Officer

- **Have explicit right to remove any individual.**
- **Can take photographic evidence of any action not in compliance to the safety guidelines.**

Facility Requirements

The following are the general guidelines any Texas Tech facility must follow:

- **Housekeeping will be maintained on an ongoing basis.**
- **Solvents or other chemicals that volatize must be worked with under a fume hood.**

- **All storage containers should be labeled with required information, segregated by their hazard class, stored in the appropriate manner, and removed by Waste Management**
- **Large or heavy items are to be stored as close to the ground level as possible to make them easier to move and prevent them from falling.**
- **Exits, Emergency eyewash stations and safety showers, aisles, and walkways must be completely unobstructed.**
- **Trip hazards must be removed or mitigated.**
- **Sharps in the laboratory need to be secured when not in use.**
- **Overhead storage must be at least 18" lower than the fire sprinkler head.**
- **When working with energetic or potentially energetic materials, a blast shield must be in place.**
- **The laboratory shall be designed so that it can be easily cleaned.**
- **Carpets and rugs shall not be placed in the laboratory.**
- **Laboratory furniture will be routinely cleaned.**
- **Bench tops will be impervious to water and resistant to heat, organic solvents, acids, alkalis, soldering equipment, and other chemicals.**
- **Chairs in the laboratory should be covered in non-porous material.**
- **Doors shall have a locking mechanism so that it can be secured when there are no laboratory personnel present.**
- **Physical and electrical hazard signs must be clearly posted on all the doors entering the laboratory so that any individual can see the sign prior to entering the laboratory space.**

- **The Texas Tech Chemical Hygiene plan dictates that laboratories must be furnished and or be located near sinks or portable sinks for hand washing.**
- **Signs should be posted for all safety concerns throughout the workspace, laboratory, and entrances.**

Incident Reporting Procedure

The following are the guidelines for individuals when a Near Miss or Accident occurs.

When a Near Miss or Accident Occurs

- **An Incident Report Form found in the Texas Tech University Chemical Hygiene Plan must be filled out and submitted to the Principal Investigator.**
- **The Principal Investigator must turn in the Incident Report Form to the Department Chemical Hygiene Officer.**

Equipment Operating Procedures

General Equipment Requirements

The following safety practices are required in addition to the general lab safety requirements:

- Power sources that are improvised or not factory standard should not be used.
- When working with voltages over 40V and current over 10A another person must be present.
- One should always know the ratings of the device being tested.
- One should adjust a device before applying voltage to the device.
- Extreme caution should be used when working with a potentially volatile component (example: a misused electrolytic capacitor) or arcing circuit. ○ If caution is not taken the resulting failure of a device can cause blindness and severe burns.
- Components that arc can cause fires and should be avoided.
- An emergency stop switch should be included in any power supplied circuit so that when opened, the switch will deenergize the entire setup.
 - Place these switches so that you can reach them quickly in case of emergency, and without reaching across hot or high voltage components.
- Always turn off equipment when you exit the laboratory.
- Never leave any device unattended running.

Function Generator

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes. Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Disconnect the power cord before removing the instrument covers when replacing components.** ◦ **Under certain conditions, even when the power cable is removed, dangerous voltages can still exist.**
 - **To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.**
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Make sure connections to terminals are secured properly.**

Oscilloscope

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Use only isolated power sources (either isolated power supplies or AC power through isolated power transformers).**
 - **This reduces possible risk by grounding the oscilloscope to a factory tested and approved source.**
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**

Power Supply

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes. Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Disconnect the power cord before removing the instrument covers when replacing components.** ◦ **Under certain conditions, even when the power cable is removed, dangerous voltages can still exist.**
 - **To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.**
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**
- **Never modify a connection when the power supply is operating.**

Soldering Station

This equipment has the following hazards:

- **Burn Hazard**
- **Exposure to Lead Fumes**

Personal Protective Equipment Required:

- **Safety Glasses**
- **Nitrile Gloves (Recommended)**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ◦ **Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Turn the soldering iron off when not in use.**
 - **Leaving a hot soldering pencil can prevent a risk to peers and can damage the tip if it has not been correctly tinned.**
- **Always solder in a ventilated area and avoid inhaling.**
- **Lead-based solder can pose a lead poisoning/exposure risk.**
 - **Always wash hands thoroughly when finished.**
- **Eye protection should be worn when working with soldering stations.**
- **Always place iron or pencil in holder when not in use.**
 - **Do not place a hot or cold pencil on any surface.**
- **Solder over the bench top to prevent hot solder from dropping on to the operator's legs.**

Portable Hand Drill

This equipment has the following hazards:

- **High Speed Rotating Parts**

Personal Protective Equipment Required:

- **Safety Glasses or Side Shields**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.**
 - **Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Always know the properties of the material to be drilled.**
 - **The density, thickness of sheet, and porousness of the material can affect the performance of the drill and the bit needed for the job.**
- **All work should be secured to the table when drilling.**
 - **In general, if the drill is capable of spinning the material towards the operator it should be secured.**
- **When drilling on a bench be sure the drill bit will not drill into the table surface.**
 - **This can be avoided by securing a scrap piece of material underneath the material to be drilled or by ensuring the drilled hole will be off the table.**

- **Make adjustments and change the drill bits only when the drill safety is on, or if it is a corded drill, with the cord unplugged.**
- **Battery powered drills have limited current, and limited torque. Corded drills have a substantial current, and thus can have more torque.**
- **When drilling with a corded drill; use caution and accelerate the drill slowly.** ◦ **The drill has the ability to injury your wrist if the flute of the drill becomes stuck.**
- **If a drill begins to twist your hand release the trigger and remove your hand to avoid injury.**
- **When drilling with a cordless drill be careful not to overheat the drill and be sure to place the battery on a charger when finished.**
- **The proper way to hold and drill is with the trigger hand connected to the trigger and the other hand on the back base of the drill to guide and provide steady pressure to the surface of the material being drilled.**
- **Do not attempt to make a smaller hole larger by “wallowing” it out, this damages the flute of the bit and will likely cause wrist and hand injury when the material catches the flute and twists the drill from the operator’s hands.**
- **When drilling deep holes withdraw the bit several times to clear the drilled area of debris inside the hole.**
- **When using any rotating apparatus; hair, loose-clothing, and jewelry must be removed before operating.**
- **As with any machine if you are unsure how to use it in a safe way ask for help or instruction.**

Source Meter

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ○ Operation of an electrical instrument in such an environment constitutes a definite safety risk.
- **Disconnect the power cord before removing the instrument covers when replacing components.** ○ Under certain conditions, even when if the power cable is removed, dangerous voltages may exist. ○ To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**
- **Never modify a connection when the device is operating.**

DC Electronic Load

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ○ Operation of an electrical instrument in such an environment constitutes a definite safety risk.
- **Disconnect the power cord before removing the instrument covers when replacing components.** ○ Under certain conditions, even when if the power cable is removed, dangerous voltages may exist. ○ To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**
- **Never modify a connection when the device is operating.**

NI Virtual Bench

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ○ Operation of an electrical instrument in such an environment constitutes a definite safety risk.
- **Disconnect the power cord before removing the instrument covers when replacing components.** ○ Under certain conditions, even when if the power cable is removed, dangerous voltages may exist. ○ To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**

- **Never modify a connection when the device is operating.**

Eagle Testing System

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ○ **Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Disconnect the power cord before removing the instrument covers when replacing components.** ○ **Under certain conditions, even when if the power cable is removed, dangerous voltages may exist.** ○ **To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.**
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**

- **Never modify a connection when the device is operating.**

NI PXI and Semiconductor Testing System

This equipment has the following hazards:

- **High Voltages**

The following practice is required in addition to the general laboratory safety practices:

- **Do not operate this instrument in the presence of flammable gases or fumes.** ○ **Operation of an electrical instrument in such an environment constitutes a definite safety risk.**
- **Disconnect the power cord before removing the instrument covers when replacing components.** ○ **Under certain conditions, even when if the power cable is removed, dangerous voltages may exist.** ○ **To avoid injuries, always disconnect the power and discharge circuits before handling or adjusting.**
- **Wear safety glasses when working with a circuit at high power or high voltage.**
- **Use rubber floor mats (if available) to insulate yourself from ground, when working in the lab.**
- **Do not exceed the limits of the device you are testing.**
- **Make sure connections to terminals are secured properly.**
- **Make sure the voltage adjustment knob is zeroed before operating.**

- **Never modify a connection when the device is operating.**

Important References

Important References

This following are important references to for the laboratory safety manual.

- **Section 5, TTU Chemical Hygiene Plan**
- **Section 11, TTU Chemical Hygiene Plan**