Lab Safety Manual

Department of Electrical and Computer Engineering

Last updated March 5, 2017
Introduction

All University employees, which include but not limited to faculty members, staff, Graduate Assistantship, etc., should read this manual before using any facility/equipment in ECE departments. Students using these labs should be trained by their supervisors, for example, Senior Design Team students should be trained by their faculty advisor(s).

The Department Lab Safety Committee is composed of Dr. Guoping Wang, Dr. Yanfei Liu and Mr. Maurice Ralston.

For any lab safety questions, please contact the Department Safety Committee and IPFW REM Department which is located at SB G48/G50.

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1. Training

The University employees (paid by the university which may include faculty/staff, GA, etc.) shall pass and complete annual safety training, which may include Hazard Communication, Hot work, Compressed Gas Cylinder, Electrical Safety, Machine Gas Cylinder, Personal Protective Equipment (PPE) training. The training materials/flyers will be sent by IPFW REM and Department Lab Safety Committee.

2. Soldering Safety in ET 335

Soldering work should be conducted in ET 335 and in designated workbench only. The soldering work station SHALL NOT be moved to another location. Before using the soldering station, employees should pass the hot work program training and PPE Training. Students should be trained by their supervisor(s). Please follow the Soldering Iron Safety posted on the wall. A copy of Soldering Iron Safety can also be found in Appendix A.

Please discard lead/silver solder and dross in the metal container with lid which is labeled as “Lead/Silver Solder Waste for Recycling”. Please close the lid after solder is dropped.

Please dispose any used solder sponges and contaminated rags in the other metal container labelled as “Solder Sponges and Rags Waste” and close the lid.

Please contact REM Department for solder/solder waste recycle/disposal.

Please wash your hand with soap after you finish soldering.

Please wear safety glasses or goggles when you do the electric soldering.

No flammable materials such as card box, wooden chairs, etc. can be stored within 15 feet of the soldering station.

Steps of PPE Training and Hot work training in ET 335:

1) Complete annual Hazard Communication and Hot Work training.
2) Read through the Purdue PPE Policy, which is available online at: http://www.purdue.edu/rem/home/booklets/PPEPolicy.pdf
3) You should make an appointment with Department Safety Committee or REM Department for face-to-face Personal Equipment (PPE) training.
4) After you finish the above steps, please sign and date the original PPE Appendix B “Personal Protective Equipment Certification of Training” hanging on the wall in ET 335.
3. **Electrical/Power Testing Station in ET 105**

Anyone who will use the Power Rotating Machine (in ET 105) shall go through the training procedures listed below.

2. Read through the Purdue PPE Policy, which is available online at: http://www.purdue.edu/rem/home/booklets/PPEPolicy.pdf
3. You should make an appointment with Department Safety Committee or REM Department for face-to-face Personal Equipment (PPE) training.
4. After you finish the above steps, please sign and date the original PPE Appendix B “Personal Protective Equipment Certification of Training” hanging on the wall in ET 105.

4. **Chemicals in ET 331/335**

The definition of chemicals is very broad, which may include correction fluid, cleaners, furniture polish, paint, solders, dish detergent, etc. For any such chemicals, after your purchase, please obtain a Material Safety Datasheet (MSDS) from the manufacturer’s website and put/organize them in the Chemical MSDS folder in that room. Please also update the chemical inventory when you purchase it in the MSDS folder. The inventory should also be updated annually in the end of fall semester by the responsible faculty of that room. The responsible faculty members for ECE room with chemicals are listed as:

   - ET 335 – Dr. Yanfei Liu
   - ET 331 – Dr. Abdullah Eroglu

If you or your students purchase any chemicals, it is the purchaser’s responsibility to update the inventory sheet, print a hardcopy of MSD, and put them in the MSDs folder.

5. **High Voltage Equipment (>=50V) in ET 331**

Before you use this high voltage equipment, please go through the High Voltage Training:

Go to [https://www.purdue.edu/ehps/rem/home/booklets/elsp.pdf](https://www.purdue.edu/ehps/rem/home/booklets/elsp.pdf) to find information about the Purdue Electrical Safety Program.

An Electrical Safety PowerPoint presentation is available for training from REM. Please contact Stephanie Steel at IPFW REM at steels@ipfw.edu, or Alan Gerth at Purdue REM at amgerth@purdue.edu for additional information and training materials on High Voltage and Electrical Safety.

**Appendix**
Appendix A: Soldering Iron Safety

Soldering Iron Safety

- Never touch the element or tip of the soldering iron. They are very hot (about 400 degree C)
- Hold wires to be heated with tweezers or clamps.
- Keep the cleaning sponge wet during use.
- Always return the soldering iron to its stand when not in use. Never put it down on your workbench.
- Turn unit off or unplug it when not in use.

Work Safety with Solder, flux and cleaners

- Wear safety glasses or goggles
- Use lead free solder.
- Keep cleaning solvents in dispensing bottle to reduce inhalation hazards.
- Always wash your hands with soap and water after soldering.
- Read and understand the MSDS for all materials before beginning work.

Dangers of Lead Exposure

- Lead on your skin can be ingested and lead fumes can be given off during soldering. Other metal fumes can also be hazardous. Lead can have serious chronic health effects, such as reproductive problems, digestive problems, nerve disorders, memory and concentration problems, muscle and joint pains.

Avoid Toxic Fumes

- Work in a well ventilated area. The smoke formed is mostly from the flux which can be irritating, a sensitizer and aggravates asthma. Avoid breathing it by keeping your head to the side of, not directly above your work.

Reduce Risk From Electricity

- Always use a grounded outlet and grounding prong to reduce the risk of electrical damage if a short circuit occurs in the equipment.
- Prevent damage to electrical cords during soldering. Keep them away from heated tips.

Fire Prevention
• Work on a fire proof or nonflammable surface that is not easily ignited.
• Wear nonflammable or 100% cotton clothing that covers your arms and legs to prevent burns.

First Aid

• Immediately cool the affected area under cold water for 15 minutes.
• Do not apply any creams or ointments. Cover with a band-aid.
• Seek medical attention if the burn covers an area bigger than 3 inches across.
• Contact instructor or Laboratory Technician.

Waste (See instructor or Laboratory Technician for discarding of Waste)

• Discard lead and silver solder and dross in a metal container with a lid.
• Label the container: “Lead (silver) Solder waste for Recycling”.
• Used solder sponges and contaminated rags must be disposed of as hazardous waste.