Senior Design and Lab Safety

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ILLINOIS
Electrical & Computer Engineering
COLLEGE OF ENGINEERING
Bench Setups

Typical: $8,500
Power: $16,500
RF: $35,500
Soldering Stations

SMD

General
What happens in Senior Design...

- Minimize use of instructional labs
  - ADSL - ECEB 2076 is used only by ECE 395.
  - Power Lab - ECEB 4024 is not to be used without special permission.
  - Wireless Lab - ECEB 5080 is not to be used without special permission.
  - Open Lab – ECEB 2024 – No coursework.

- Do not plan to use instructional lab equipment in your design. (ECE 385, 343…)

- Complete online laboratory safety training for 2070 access by Friday 1/25
Lab Policies

• **No working alone!**
  Students must work in pairs.
• No food or drink
• Do not remove equipment from lab
• When AC wall potential is used an instructor or TA must be present.
Keep it clean

• NO FOOD IN LABS!
  • Exception for sealed water bottles.
  • Keep them on floor, not on workbenches.
• Keep lab clean
  • Clean benches after sessions.
  • Cables on hangers / Probes in Bins
  • Kits and components put away
  • Email if you need clearing supplies.
• End of Semester Cleanup
  • As part of your final checkout you will be responsible for cleaning your work area.
  • Take 10 Minutes: Every time you’re in the lab take some time to organize and clean. It adds up.
What is “clean” anyway?

This

NOT this
Lab Maintenance Policy

• No-tolerance lab policy
  • If soldering irons are left on, or the lab is exceedingly messy, the lab will be closed for at least 24 hours, or until further notice, for each infraction.

• Sign logbook for the soldering room
  • TAs and instructors will be randomly conducting checks throughout the semester. If a student is found using the soldering room without signing in, the student will be penalized.
Power Hazards

- **Electrocution**
  - Don’t make changes to a circuit when power is applied. Always treat cases as electrically live & do not leave circuits exposed.
  - Avoid presenting body as ground path. One Hand Rule.
  - Do not defeat ground connections with adaptors.
  - Capacitors can hold charge a long time after power is removed and deliver that charge very rapidly.
  - Current cannot change in inductors instantly. Don’t forget motors are inductors!

- **Burns**
  - Use wiring of appropriate length and gauge. Does it smell hot?
  - As little as 1W can cause burs for small parts

- **Fires**
  - Do not use a battery when a bench power supply will do.
  - Cover battery terminals to avoid shorts. High short circuit currents!
  - Store batteries in yellow lockers. No unattended charging.
Equipment Damage

- Check Ratings
  - Does the function and ratings of the instrument match the signals you are attempting to measure?
  - If in doubt ask!

- Understand how probes and sources are grounded

- Do not cram too much into lockers. Items pressing against locks make lockers very difficult to get open.

- Report malfunctioning equipment
  - E-mail ece-eshop-repairs
  - ‘Red Tag’ equipment
If a Problem Occurs

• Tend to your immediate safety first! Leave area if necessary and get help!
• Shut off power
• Locate problem before power is restored
• If circuit breaker is tripped, report to ece-eshop-repairs to reset
• If help is needed contact me or electronics shop for assistance
• In event of an accident or emergency call 911
First Aid Stations

- First Aid Kits considered single use. Report all use to me for restock.
- Report all injuries to ece-safety & course staff immediately.
- Land-Line phone works in event of cell phone or power interruption.
- In event of an accident or emergency call 911
Fire Safety

- Shut off soldering irons!
- Plan ahead: Identify closest alarm pulls and exits.
- Identify location of fire extinguishers in your lab. (If equipped)
- Personal safety comes first. Pull alarm, and evacuate building.
- Assemble in grassy area East of ECEB
BEAP

• **Building Emergency Action Plan**
  - Each floor has floor coordinator.
  - Areas of rescue assistance with marked call boxes.
    - SW Stairwells on floors 2-3.
    - E & W Stairwells on Basement and floors 2-5.

• **Get Out / Run**
  - Fire, Earthquake, Finals Week, Etc
  - Evacuation assembly areas are grassy area E of ECEB outside main lobby or inside Beckman Institute Atrium in bad weather.

• **Stay In / Hide**
  - Storms
    - Refuge areas in basement and interior hallways and bathrooms.
  - Security Threat
    - Secure your classroom or lab.
    - Run / Hide / Fight
HELP!?

• **TAs** – This should always be the first stop.
• **Lab Coordinator** - ECEB 2044 - [cjsmith0@illinois.edu](mailto:cjsmith0@illinois.edu)
• **Electronics Shop** – ECEB 1041 - [eshop.ece.illinois.edu](http://eshop.ece.illinois.edu)
  • PCBs
  • Kits
• **ECE Machine Shop** – ECEB 1047
  • Mechanical Fabrication
• **ECE Supply Center** – ECEB 1031
  • Electronic Components