Induction Training
Conducting Laboratory Sessions

CHEN Xuanqi & JING Liwen
Department of Electrical and Computer Engineering
Rundown

Part 1: Introduction to Conducting Laboratory in ECE Department

Part 2: Discussion

Part 3: Q & A
Introduction to Conducting Lab Sessions

What is the “regular UG lab” at ECE?

- **Computer simulations**
  - ELEC 2410, 2400, 2200, 2300, 3400, 2100, 3110, 3100, 3200, 4410, 4310, 4440, 4420, 4110, 4120, 4620, 4180, 4160, 4430, 4170

- **Circuit connections**
  - ELEC 2410, 2400, 2200, 3400, 3100, 4510, 3300, 3200, 4440, 4430, 4810

- **Optical adjustment**
  - ELEC 4610 Engineering Optics,
  - ELEC 4620 Photonics and Optical Communications
Introduction to Conducting Lab Sessions

What is the “regular UG lab” at ECE?

- Simple measurements
  - ELEC 2410, 2200, 4510, 3200, 4150, 4810
- Handing Dangerous Chemicals (e.g. Fabrication)
  - ELEC 4520 Integrated Circuit Fabrication Technology
Introduction to Conducting Lab Sessions

• “Hydrofluoric acid is an extremely corrosive liquid and is a contact poison…”¹

• “Once absorbed into blood through the skin, it reacts with blood calcium and may cause cardiac arrest.”¹

• Question: Will you immerse your hands into HF with your safety gloves on?

Hydrofluoric Acid Burn

Source: http://en.wikipedia.org/wiki/Hydrofluoric_acid
Introduction to Conducting Lab Sessions

3 Phases of a Lab Session:
• Before Lab
• During Lab
• After Lab
Before Lab – Preparation

- Contact and meet the **course instructor** & **technician** to discuss the lab work

Be clear about the

- **lab time and date**
- **learning objectives**
- **equipment and materials**

(update course web-page well beforehand)
Before Lab – Pre-run

• **Read & understand** the manual

• **Make** a **trial run** of the lab especially for those who are not in that area!!

• **Know the steps & result** of the lab don’t be a troublemaker for smart students

• **Check equipments & samples** additional materials/instruments (if needed)
Before Lab — Self-evaluation

• Can I do the lab myself within the time?
• Am I familiar with materials & equipment?
• Would handouts be helpful?
• How lab material coincide with the lecture?
• What are the safety considerations?
Before Lab - Information

- Any Pre-Lab question?
- Web-page update
  - Upload manuals at least 1 week before the lab
- Email reminder
  - About time & venue
  - Lab allocation
  - The dress-code or clothes demand (if exists)
During Lab

At the beginning of the lab

• Provide **clear and complete instructions**
• Review the **safety** rules
• Point out **common mistakes** of the work
During Lab

Supervise students during the lab period

• Have a good **time control**
  (students should finish the lab on time)

• Walk around the room

• Give reasonable **hints** (don’t tell too much)

• Avoid **cheating/copying**
During Lab

- **Encourage** students’ thinking ability
  - Asking instead of giving answers
- Give **timely/active** feedback to student
  - Positive comments come first than negative
- **Assess performance** in lab
  - Students’ preparation
  - Ability to perform lab techniques
  - Understanding of the lab procedures
After Lab

- **Collect Lab Reports on time**
- **Grade Lab Reports**
  - Follow marking and grading HKUST policy
  - Provide feedbacks and comments
  - Rubric may be used for grade
- **Post-lab consultations** *(curious students)*
  - answer questions on course related theories in-depth
- **Report typical mistakes** *(course instructor)*
Examples (ELEC 4310 & 2300)
• ELEC 4310: Embedded System Design
  (Computer Simulation)

• ELEC 2300: Computer Organization
  (Computer Simulation)
Pre-lab

- Revise the lab instruction accordingly.

Take advice from 1. course instructor & technician
2. response from UG students 3. your own experience conducting the lab.

Conducting Laboratory Sessions
Pre-lab

• Do the experiment by yourself.

So you can know what problems that UG students will encounter during their lab session.
Pre-lab

- Release announcement for the coming lab session.

LEMS (seldom used anymore)

Usually **one or two weeks** before.

Conducting Laboratory Sessions
During-lab

- **Safety** is the most important thing.

- Especially…..

- In Optical experiment, we will use class-II laser which should not be directly reflected into eyes despite of its low power.

- In Fabrication experiment, watch out chemicals!

Not only about the UG students, but also about yourself.
Group Discussion
Questions

• Q1. When students are going to make mistakes in the process, shall you stop them? Why?
• Q2. How to prevent the lab session overtime? (except using check points)
• Q3. What could you do if they look for quick answers and approval for shortcuts rather than focusing on the learning from the experience?
• Q4. What will you do if cheating happens? (among different groups & among different group members)
• Q5. How to overcome the possible language problems?
• Q6. What would you do if you find your GTA partner is not professional enough?
• When students make mistakes in the process, should you stop them? Why?
  ▫ Depends on situation, if it’s critical, has to stop them immediately; if it’s not critical, guide them through by asking questions
• How can you prevent over-run of the lab session? (except using check points)

For GTA:

- Pre-run by GTA
- Check equipments, configurations and samples
- Check points.

For Students:

- Rules for punctuality
- Check whether student has prepared well
- Bonus point for early finished students (punishment)
What could you do if students look for quick answers and shortcuts rather than focusing on learning from the experiments?

- Break down into small steps
- Encourage students positively
- Access students and understand the reasons behind
• What will you do if cheating happens? (among different groups & among different group members)

**Among different groups**
- Give a warning & Try to help
- Contact the instructor & deduct the grades for further warning (serious case)

**Among group members**
- Try to figure out the problems
- Rearrange the group
- Require different data for lab reports
• How to overcome the possible language problems?
  ▫ Be patient
  ▫ Using figures and other possible methods to explain
• What would you do if you find your GTA partner is not professional enough?
  ▫ Figure out the problem very casually.
  ▫ Send email or discuss directly to demonstrator or instructor
Conducting Laboratory Sessions

Q & A
Kind Reminder

• Anybody forgets to sign his/her signature on the attendance sheet?