EEC390: Teaching Electrical and Computer Engineering
Sessions III-IV - Laboratory Instruction

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Outline

- Discussion of Current Issues
- Laboratory Instruction
  - Preparation
  - Conducting the session
  - Evaluation
  - Safety and security
- Laboratory Notebooks

Preparation for a Laboratory

- Work with instructor to know what is expected of you
  - Will you give an introduction to the lab?
  - Will you do any demonstrations?
- Study the laboratory procedures and be *sure* you know how to do them all!
  - Do any prelab yourself
  - Do the lab yourself if you are *at all* unsure
  - Anticipate student questions
  - Be sure you know how to use the equipment thoroughly

The First Laboratory Session

- You are the one in charge
- Write on the board:
  - Name, course name, lab section, office hours
- Take roll (try to learn the names)
- Form lab groups if appropriate
- Assign groups to benches
- Set the tone; prepared, serious, respectful
- Explain your role; not to give answers, not to solve problems for them, to *assist* them

Subsequent Laboratory Sessions

- At the beginning
  - Start on time!
  - Outline what is to be done this session
  - Answer questions
  - Check prelabs (if appropriate)
- During the session
  - Circulate and observe (don’t stay still)
  - Answer questions
  - Ask questions (more important!) - avoid difficulties
  - *Assist*, don’t *do*

Circuit and Computer Laboratories

- For a circuits laboratory
  - Don’t set equipment for them
  - Don’t fix circuit for them
  - Be sure they have the schematic and ask precise questions
  - Give suggestions, then time (return later)
- For a Computer laboratory
  - Don’t take over the keyboard
  - Make them ask precise questions
  - Give suggestions, then time (return later)

At the End of a Laboratory Session

- Remind them of upcoming deadlines
- Make any necessary comments about the next laboratory assignment
- Make sure they clean up their area and return any equipment taken from the issue room

Evaluation

- Discuss with the instructor how labs are to be graded
- Coordinate grading with other TA’s and/or readers as appropriate
- Encourage proper use of laboratory notebooks (more later)
- Make enough marks to be able to remember what you did, but avoid lengthy comments

Laboratory Safety

- You are responsible to notify the department immediately if there is any unsafe condition
- If a personal injury occurs, the student must be taken to the Student Health Center immediately (by ambulance if necessary). Fill out paperwork within 24 hours (see Karen Gurley)
- No unsupervised students should be in the labs & no casual traffic is allowed

Laboratory Safety Continued

- No cables or cords should be cut or modified
- Shoes must be worn at all times
- Bicycles are not allowed in the labs
- Food and beverages are not allowed in the labs
- Additional safety procedures must be followed in the microfabrication facility, the optics labs, and the project labs - consult the instructor

Laboratory Security

- Don’t let students move equipment
- Don’t open any equipment
- Verify any problems reported with the equipment and then report them to Barry Vose in 2162 Engineering II
- Don’t leave laboratories unattended or unlocked (except for computer rooms that are supposed to be left open)

Laboratory Notebooks

- You need to help the students learn how to use one properly
- Very different from an engineering report
- Check with your instructor for any specific requirements in your course

Laboratory Notebooks - Purpose

- Notebooks are used to:
  - record design ideas and detailed work
  - summarize simulations and measurements
  - keep a record of project details (e.g., phone calls, purchases, other related information)
  - record notes from reading papers and books
  - be a legal record for patent results (when appropriate, pages are witnessed and signed)
- Notebooks are the property of the company - you don’t usually keep them

Laboratory Notebooks - Format

- Objective is to provide enough information to recall what you did when to help with the project and with patents
- No rigid format, but;
  - should be neat and readable (in ink)
  - it is a *work* book, don't work on scratch paper and rewrite! (wastes time and misses details)
  - often only in outline form, not complete sentences
  - don't EVER leave blank pages
  - good idea to include a table of contents

Notebook Format Continued

- Example (assumes a circuit design)
  - Objectives
  - Specifications
  - Design (method, calculations, assumptions, decisions, tradeoffs)
  - Schematics
  - Testing (details of equipment used, procedures, results, interpretation)
  - Revisions and re-design
  - Conclusions

Academic Issues with Notebooks

- Notebooks should *be used* in the lab! Make the students bring them and use them.
- Grade appropriately - i.e., don’t discourage proper use as a work book by harsh grading of work in progress - it is NOT an engineering report
- When you help them, make them show you schematics and other information in their notebook - like a colleague in industry

Engineering Reports

- A formal document written to summarize a project or a portion of a project
- Usually written for supervisors, investors, or customers
- Writing should be clear and concise - this is *not* a workbook!
- Day-to-day details are left out (no one wants to hear how hard it was to get that one part or find that one bug)
- Laboratory notebook provides raw data