Guidelines for ECSE Design Lab Notebooks

The Lab Notebook is a session-by-session record of what individuals do as a member of the project team at each step of the design, construction, and testing of the project, and it is updated whenever project work is done. Most research and development work in industry will require keeping a similar log. It enables you and/or others to pick up the thread of your past work and carry it forward and serves as a legal record supporting patent claims. The book should show entries made at or shortly after every working session.

In the context of this course, the notebook additionally serves as documentation of progress. It is often referred to when project demos are not successful. The notebook can be requested by the instructor to resolve disagreements among the team members about how much effort each member put into the project. Finally, students that attempt to obtain patents may find that this notebook is a crucial piece of information for proving their work.

The notebook should prove that each partner is individually carrying an important part of the design effort. ***Each group member must keep his or her own lab notebook.*** Freely referring to the work of teammates is encouraged (e.g. "Fred derived the full equations for harmonic detection in his notebook. The basic idea is to look for peaks at integer fractions of the highest peak..."), but the notebooks submitted at the end of the semester should not be identical.

To stress the importance of keeping track of your progress, the instructor and TA will conduct occasional spot checks of your notebooks, and your notebook will contribute to your final course grade.

Any notebook with permanent bindings designed for laboratory record-keeping is acceptable. Those with pre-numbered pages are preferred. Ideally, it should have graph rulings on alternate pages, or else quarter-inch square grid on all pages.

Each notebook entry should include:

- the date
- a brief statement of the objectives for that session
- a record of what was discussed / done
- any relevant equations, diagrams, and figures, numbered for reference in the narrative portion of the book
- drawn figures, diagrams, and photocopies extracted from published sources
- references to books, papers, or websites

All separate documents should be permanently attached to the notebook.

Overall, the book should contain a record that is clear and complete, so that someone else can follow progress, understand problems, and understand decisions that were made in designing and executing the project.

What to include (at a minimum):

- A copy of your project proposal.
- Bibliographic references for any materials that are used as sources. Many of these references will be needed in the written report, later.
- Diagrams, schematic and/or block, for any hardware that is to be tested. There should be an accompanying discussion explaining the principal design problems and decisions. Proposed tests should be mentioned here, too.
- Equations and formulas used in the design process, along with a reference to their sources. If derived by you, sketch enough of the development so that someone can follow the idea from your notes.
- Documentation of the testing and debugging process. This may include notes of what is being checked, test set-up diagrams, and non-routine results. Difficulties should be noted with particular care. It is wise to note anything of any conceivable importance when dealing with debugging problems.
- Analysis of, and proposed solutions for, any debugging problems. Include all revisions of diagrams and test setups and any new equations, etc.
- Documentation of the new tests, as before.
- Documentation of final performance tests and design verification.
- Topic outlines for oral and/or written reports can reasonably be included.

There is always something to record. Suppose you are only "kicking around" design ideas for the project with someone, or scanning library sources. Your objective is what you're hoping to find. The record shows what you found or what you decided and why, even if it isn't final. One of the most common errors is to fail to record these seemingly "unimportant" activities.