Lab Notebook Guidelines

The lab notebook is the proof that the experiment was carried out in the manner described in the scientific paper or in the lab report. All the details of the experiment, results and analysis must be in the lab notebook; otherwise the results cannot be verified. It should be a well-written narrative including experimental schematics, plots and raw data, detailed methods for data analysis and interpretation of results. Any person should be able to repeat your experiment based only on your lab notebook.

General Considerations

- Lab books must be bound. Spiral notebooks are not acceptable. Write your name, date (semester), and class name on the front cover.
- All lab book entries must be in pen. Entries to be discarded or ignored should be crossed out with a single line indicating why this should be ignored.
- Leave the first two pages blank for a table of contents. The table of contents must list the page where each new lab experiment begins. Pages must be numbered. This can be done by hand.
- Start a new page for each new date or new experiment and write the date at the top of the page.

Technical Content

- Answer all questions from the experiment guide, and complete all the parts of the experiment.
- Summary of objectives and procedures. For each experiment include a statement in your own words of the essential physics behind your experiment and the goal of the experiment.

Description of the experiment

- Experimental Procedure: for each experiment, including calibration experiments, write down your experimental procedure in detail so that anyone can understand what you did and repeat your experiment using your notebook without the lab guide. Describe what you did instead of listing a series of instructions.
- Include diagrams of the experimental setup. Diagrams are original drawings of your experiment, not just a copy of the lab guide. They should clearly identify important components of the setup.
- Include a description of each important component of the setup including functionality, i.e. how each component works, and how the components work together in your experiment.
- Explain how your experiment works and how you use it to obtain the measurements to determine the physical parameter of interest.

Data

- Present your data for all parts of the experiments in the form of tables and/or plots with units. Include any information necessary to understand the data (e. g. radioactive sample type, run number, equipment settings, etc.), and provide units and uncertainties when applicable.
- When data is collected electronically (plots, tables, printouts, etc.), it needs to be printed and glued or taped in lab notebook. Loose sheets are not accepted and not reviewed.
- Include a short summary of the results.

Analysis and Results

All experiments require calculations, derivations, and results including complete error analysis. Anyone, including the instructor, should be able to follow the calculations and data and error analysis. This validates the results described in your formal report.

Include all calculations that may be required for the experiment, for example, to calculate expressions to determine a physical quantity of interest derived from measured quantities, with a description of the purpose of the calculation.

- Include the analysis for the calibration of equipment, including curve fitting when necessary.

Error analysis and uncertainties

- Perform complete error analysis including propagation of error based on your numerical results, and obtain the final uncertainty. List the systematic and statistical errors.
- Present the results of your analysis in tables or plots with error bars (use computers available in Junior Lab), and include curve fitting when required. Include results of the data analysis with associated uncertainties.
- Compare your results with accepted values. How good is your measurement in terms of precision and accuracy?

Note: Write clearly. Illegible content, including data and narrative, won't be reviewed.