Laboratory Reports

Instrumental Analysis  Fall, 2007

Probably the most demanding component of this course is writing and turning in, on time, the laboratory reports. Although laboratory work will be conducted in groups, and you should feel free to discuss the results/procedures with other students, each of you must write an independent report for each completed lab.

Grading of the report will reflect both the results of the laboratory exercise and the quality of the organization and writing of the report. Grammatical errors, poor sentence structure, and misspellings will lead to lower grades.

It is important that you discipline yourself so that you don’t end up trying to write your reports the night before they are due. It is not possible to write a quality report in one night. Not only does each report take a long time, but if you delay your writing, the details of what you did will fade from memory. Keeping a careful notebook will help this, of course, but it will still be better for you to write up your lab report as soon as possible after completion of the lab.

Late laboratory reports will be assessed a 10% (of total possible) penalty for each school day late.

Philosophy

You might think of writing as simply communicating what you know, but for students it also serves as a really effective way to learn. This is certainly true of the laboratory reports you will need to complete in this course. Writing extensive laboratory reports forces you to think through all aspects of the laboratory experience, including the important instrumental concepts that are the focus of the course.

So, how do you use writing to help you learn? What you do not do is copy or even paraphrase conceptual descriptions from your texts, the WEB, or handouts. Since reports will be uploaded and scrutinized by the turnitin web site, this is literally a recipe for failure. The way to write effectively is to read your references, take some notes, then sit down and synthesize what you know in your own words. Only then can you assess what you actually know and do not know.

Format

Generally, follow the format found in the ACS Style Guide for submission of a research manuscript. An abstract is not required. To summarize:

I. Introduction

This might be a few paragraphs discussing the instrumental concepts you have explored, culminating in the motivation for the laboratory exercise.
II. Experimental Procedure

An organized, extensive, narrative description of what you did. No results should be included in this section. This section should be in sufficient detail that an experienced person, unfamiliar with this work, could repeat what has been done and obtain comparable results; the “litmus test” of a good experimental section.

III. Results and Discussion (including sample calculations)

Many of our lab handouts will suggest things to include in this section. Summarize the data collected and their statistical treatment. Include only relevant data, but give sufficient detail to justify your conclusions. The use of tables, figures, equations is recommended for clarity and brevity. Interpretation (i.e. discussion) of the results should be included. Any table or figure used must be numbered (i.e. Table 1, Table 2, Figure 1, Figure 2, etc.), and referenced in the body of the text. An example might be “Results from the calibration data are given in Table 1, and plotted in Figure 1.” A cardinal sin is to include tables and figures, not numbered, and not refer to the table and figures included in the text.

IV. Conclusions

Conclusions should be based solely on the evidence presented. Statements like "I learned a lot" are meaningless, are not justifiable based on the results, and will be graded harshly. Statements such as “an increase in spectrometer resolution results in a decreased signal-to-noise ratio” would be appropriate if supported by the results.

VI. References

Number your references in the order which they appear and are referenced in the text. Any references given at the end must be referenced in the body of the text. Referencing your textbook(s) is OK.

The reports should be typed and double-spaced. The use of sub-headings is strongly encouraged, as this is an excellent way to clarify and organize your material.