Principal Parts of a Lab Report

The principal parts of Lab reports are:
1. Cover Page
2. Title and title page
3. Summary
4. Introduction
5. Body of Report
6. Conclusions and Recommendations
7. Sample Calculations

1. Cover page

The cover page should include the title, the name(s) of the student(s) and the date when report was submitted.

2. Title and Title Page

The title of the report should appear in the appropriate place on the cover page. The title should be brief and descriptive of the problem being reported.

3. Summary

This is a very brief, concise statement of what was done and what were the general results. No details of the results need be presented. The reader should have enough information to decide if the subject is sufficiently interesting to him/her to read the details included in the remainder of the report.

4. Introduction

The purpose of this section is
a) to introduce the reader to the subject matter
b) to justify performing the work and again, this section should be brief.

5. Body of the report. This is not a section title.

This part of the report includes the details, or the “meat” of the report. Its purpose is to address the following questions in details.
a) What was done
b) How was it done
c) What was found out
In order to answer these questions, the writer has some choice on how he/she structures this part of the report, his/her choice being dependent upon the nature of the study and to whom he/she is writing the report. Possible structure for this part might include some or all of the following sections, each of which should be appropriately titled.

a) Background
   Details of previous work; historical summary, theoretical background
b) Theoretical or Analytical Considerations
   New theory or extension of existing theory to this problem; predictions.
c) Description of Equipment
   Test set-up’’ instrumentations (particularly if new or unique)
d) Results
   Tabulations, data sheets, plots, graphs, curves, discussions of results.
The discussion should always include sources of errors, and estimates of their magnitudes.

6. Conclusions and Recommendations

   A Lab report may not have a conclusion section at all and should not unless true conclusions and/or recommendations can be drawn. Every conclusion you make should be based upon facts covered in the results. Recommendations you make (e.g. further work, changing equipment, etc) should be based upon these conclusions.

7. Sample Calculations

   Sample calculations are not normally part of a technical report. In AerE243L, however, we require the instructor can locate errors in your analysis.
Graphs and Plots

Graphs and plots may appear in many of the different sections of the report, but they should appear as parts of the sections which they support.

There are certain rather rigid requirements of constructions of graphs and plots of Aero. Engineering reports. They are presented in following paragraphs.

1. **Margins.**
Theor should be a reasonable margin around the border of each graph or plot. For most graph sheets this means that the axes will have to be indented into the coordinate field of graph paper.

2. **Mounting Orientation.**
The graph sheet should be mounted in the report so that the bottom of the graph sheet is either at the bottom of the folder or at the right edge of the folder.

3. **Axes.**
The coordinate axes of the graph should be made definitely heavier or darker than the other lines on the sheet. These axes should appear as major lines of the graph sheet if the sheet is prepared with lines of different accents.

4. **Axes Notations.**
Each axis should be supplied with appropriate notations showing:
Name of the variable being plotted along that axis, the symbol for that variable if there is any, the units for the plotted variable which the scalar represents, if there are any, the scale for that axis.

5. **Scales**
Scale values of the variable being plotted are to be placed at every inch or at every two centimeters depending upon the graph paper being used. The scales shall be selected so that the least count—the value of the smallest division of the axis—is a positive or negative integral power of 10 multiplied by 1, 2, or 5 (e.g. 0.01, 2.0 or $5 \times 10^5$). All other scales are not legitimate and will not be accepted. The reason is quite clear: these scales are interpolation of data between coordinates a relatively simple job in both plotting and reading the graph.

6. **Symbols and Plot Identification.**
Points plotted from experimental data should be plotted as points with small symbol (circle, square, triangle, cross, etc.) surrounding the point. If more than one plot is made on one graph, then different symbols should be used to indicate the sets of data. **Lines are not to be drawn to pass through the symbols when making the graph**.
A second way to denote the difference between two plots on the same graph is to vary the character of the lines for the various graphs. For example, lines may be sold, dotted, dashed, dash-dotted, etc. It is also sometimes convenient to label each line with an appropriate identifying word or phrase. Lines drawn through data points must either have an equation to identify them or if they are just average lines, they should be so identified.

Ordinarily, data plotted from theoretical or analytical calculations are not plotted with symbols around the points. There may be instances in which it is desirable, however. For example, if the calculation procedure involves errors that may show up in the plots, it may be desirable to use a symbol around the plotted point to indicate the possibility of error in that point.

7. **Title and Legend.**

Each graph or plot should be identified with a title and legend. Included in this legend should be;
- Figure Number
- Title of the figure or plot
- Any other important information such as name of author, date of the test, the equation being plotted, etc
Tips on Report Writing

1. Assemble all your analyzed data.
2. Prepare an outline. Decide on the major headings and jot down a few words on what you intend to cover in each.
3. Write the introduction first. It requires you to get all the ideas together at once.
4. Remember your purpose is to inform the reader. Know who the reader is to be and write for a person of his/her background.
5. Be concise. Don’t just try to fill up space.
6. Read over what you write and try to put yourself in the place of the intended reader.