1. Guidelines to Writing Lab Reports

Lab reports are based on the centuries old “Scientific Method,” where fundamental theories of science, upon which engineers base their designs on, are observed, tested and verified. Your ability to effectively communicate your (or your group’s) results determines your effectiveness as a future professional engineer.

The **layout** of the report:

1) Cover Page - with names of group members (see template).
2) Summary – 1 paragraph summary of the lab, on it’s own page, last sentence should be the major conclusion.
3) Introduction – Introduce the objectives of the experiment.
4) Apparatus – Equipment used for the experiment.
   - Instrumentation used.
   - Materials used during the experiment.
   - If the lab manual has these descriptions, refer to these pages or detail any differences between the lab manual and actual apparatus used in the lab.
5) Procedure
6) Results – including Figures and Tables
7) Discussion
8) Conclusions
9) References
10) Appendices – mathematical analysis
    - spreadsheets
    - original lab notes, observations
    - other essential information

The **format** of the report is as follows:

- Typed - Reports are to be typed, 12pt font, Times New Roman, 1” margins, although the mathematical analysis can be hand written neatly.
- Paper – use plain white 8.5” x 11” paper. Reports handed in on the back of paper bags, paper towels, folds cape, etc., will NOT be marked.
- Page Numbering – all pages except the cover should be numbered. The summary should be numbered with a roman number “ii”, regular Arabic numbers (1,2,3…) should follow from the introduction.
- Headings – should be used to delineate the different sections of the lab report. The introduction should be numbered “1. Introduction” with subsequent sections numbered consecutively.
- References – all citations made in the text of the report, figures and tables that are not your lab results (ie. From the textbook) must also be cited. Use square brackets [#] after your citation, and number them consecutively, for example:

  Heinz Ketchup is a non-Newtonian fluid [3].
Under Ryerson Policy #60, failure to properly cite references may result in a charge of academic misconduct and a disciplinary notice on your university record.

- Equations - within the main body of the report must be typed and numbered, for example:

  \[ \sigma_y = \frac{\pi^2 E}{(L/r)^2} \]  
  Eq. 2.3

- Use “engineering” exponential format when necessary (ie. powers of 3), for example:

  \[ E = 200,000 \]  
  can be written as \[ E = 200 \times 10^3 \]

- Except when dealing with non-dimensional numbers, all numbers in the report must have units. Remember to use the proper number of significant digits. Use the SI prefix when using SI units, for example:

  \[ P_x = 378.6 \text{ MPa} \]

Tables:

Tables should be numbered consecutively, with a caption placed above the table. The table and caption should be centered in the page. The caption should be concise, but fully describe the data in the table. Raw data is usually tabulated in the appendix, with only the data summary appearing in the main body of the lab report. Tables must be referenced in the text before appearing in the report. The word “Table” should be capitalized in the text. Make sure that the columns in the table have their decimal points aligned and that units are used. If the data for the table is from a source, make sure you reference the data. For example:

The rain in Spain falls mainly on the plain. Yearly rainfall totals are summarized in Table 6 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>East Plain (mm)</th>
<th>West Plain (mm)</th>
<th>North Plain (mm)</th>
<th>South Plain (mm)</th>
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<tr>
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<td>43.5</td>
<td>10.2</td>
<td>32.3</td>
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<tr>
<td>1984</td>
<td>34.2</td>
<td>51.2</td>
<td>12.3</td>
<td>37.2</td>
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<td>29.4</td>
<td>64.8</td>
<td>9.0</td>
<td>28.9</td>
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<tr>
<td>1987</td>
<td>32.1</td>
<td>55.1</td>
<td>14.2</td>
<td>31.2</td>
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</tbody>
</table>

*footnotes about the data are placed under the table

Figures:

Subjects that are graphical in nature; diagrams, graphs, charts, flow charts, photos are termed “figure”. Figures should be numbered consecutively, with a caption placed below the figure. The figure and caption should be centered in the page. The caption should be concise, but fully describe the figure. Figures must be referenced in the text
before appearing in the report. The word “Figure” should be capitalized in the text. If you are graphically displaying data, the independent variable is plotted on the X-axis, with the dependent variable plotted on the Y-axis. Make sure that the axis are clearly labeled, with what was measured, quantity measured and the units used. If the data for the figure is from a source, make sure you reference the data. For example:

The rain in Spain falls mainly on the plain. Yearly rainfall totals are summarized in Figure 6 below.

![Figure 6. Yearly rainfall on Spanish plains][3]

9. References


MEC123 Lab Report No. 1

The Effect of Gamma-Rays on Man-in-the-Moon Marigolds

Program: Mechanical Engineering
Lab Group 5.2 (i.e. Section 5, group 2)
Lab Date: January 15, 2007
Due Date: January 29, 2007

Prepared for:
Prof. A. Hardmarker

<table>
<thead>
<tr>
<th>Names</th>
<th>Student ID</th>
<th>Signature*</th>
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<tbody>
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(note: remove the first 3 digits from your student ID)

*By signing above you attest that you have contributed to this written lab report and confirm that all work contained in this lab report is your group's own work. Any copying or plagiarism found in this work will trigger an Academic Misconduct charge, including failing grades, suspension and possibly expulsion from the University under Ryerson Policy #60, which can be found online at: www.ryerson.ca/acadencouncil/current/po160.pdf.