

Engineering Report Formats

I. Formal Engineering Reports

The Formal Engineering Report should contain the following sections:

1. Introduction

This section should introduce and briefly summarize the experiment or project and its objectives.

2. Theory or Background

This section should include the relevant background theory pertaining to the experiment. Extensive derivations are not necessary but the equations that must be used later should be introduced with underlying assumptions. Figures are sometimes necessary in the background section to define relevant parameters.

3. Methodology

This section should contain a complete description of the work that has been performed. It is critical that all experimental work (and relevant experimental equipment) be completely described using text descriptions and figures where necessary. The exact process that was used to collect data should be detailed as clearly and concisely as possible.

4. Results and Analysis

The results of the work described in *Methodology* should be given. If data is voluminous then a tabulation of data may be presented in an appendix. Often a graphical summary of data provides a meaningful depiction of the data. The analysis of the data should be detailed. If the analysis entailed many steps, then a text description of the process supplemented with intermediate results (graphical or otherwise) may be given. It is important to be complete in this section. Arguably, *Results and Analysis* is the most important section of the report. Conclusions should be stated here. Additionally, the names of lab partners should be included here.

5. Summary

This section should include a nutshell description of what was done and the results and conclusions. A statement of recommendations for future work should be made, including improvements in equipment or

process. One may also consider other interesting directions in which the experiment might be focused.

References

The following are sample references.

Here is an example of a book as a reference:

Okuda, Michael, and Denise Okuda. Star Trek Chronology: The History of the Future. New York: Pocket, 1993.

Here is an example of a journal article as a reference:

Wilcox, Rhonda V. "Shifting Roles and Synthetic Women in Star Trek: The Next Generation." Studies in Popular Culture 13.2 (1991): 53-65.

Here is an example of a website article reference:

Lynch, Tim. "DSN Trials and Tribble-ations Review." Psi Phi: Bradley's Science Fiction Club. 1996. Bradley University. 8 Oct. 1997. <<http://www.bradley.edu/campusorg/psiphi/DS9/ep/503r.html>>.

And here is another web address (the one from which I retrieved the samples above):

Delaney, Robert. "MLA Citation Style." 2002. B. Davis Schwartz Memorial Library at Long Island University. 20 Nov. 2002. <<http://www.liu.edu/cwis/cwp/library/workshop/citmla.htm>>

6. Appendices

Appendices are reserved for information that generally occupies so much space that the flow of the report is disrupted significantly. An example would be a great deal of tabulated data, which really goes with the *Results and Analysis* section might need to go into an appendix. Photocopies of your original data collection and notes from your lab notebook should be included as an appendix.

Nit-picking details

Issues of appearance and presentation for an engineering lab report must be considered for several purposes: standardization, ease of understanding for the projected audience (in this case other engineers), and professionalism. There is no set standard for some formatting issues, but for this class the following instructions should be followed:

- Margins: 1" on all sides
Font: Times Roman or Arial, 10 to 12 point
Spacing: Use line spacing of 1.5 or 2. Captions for Tables and Figures may be single-spaced.
- Title Page: Every Report should have a title page with the following information (each item should occupy one line and the block of text overall should be centered horizontally and vertically on the page)
Title (larger font and bold)
Your Name
Name and number of the course
Date
- Numbers: Number all pages except the title page using the same font (and same size) as the body of the report. Page numbers should be at the bottom center of each page.
- Equations: Centered horizontally on the page with equation number either at the right margin or below as shown in Eq.(1). Note that references to an equation should be shown as in the last sentence with *equation abbreviated* and the equation number in parentheses (no spaces). Typically the font for variables in equations is Times Roman italicized with sub- and superscripts in the same italicized Times Roman font but about a third the size of the regular font

$$p = p_0 - \frac{1}{2} \rho V^2 - \rho g z$$

Equation 1

- Tables: Tables should be centered on the page and given an appropriate format. **Above** the table a table number should be given and a brief caption that describes the contents of the table as shown in Table One. Note that references to a table should be shown as in the last sentence with the *table* capitalized and the number spelled out if the number is between one and nine. For numerical quantities the units should be indicated in parentheses in the top row of the table.

Table One The ARK1 response matrix for the Lil Bonner sphere system.

Max Group Energy (MeV)	Bonner Sphere Detector (cm ²)						
	Bare	2inch	3inch	5inch	8inch	10inch	12inch
1.00E-08							
4.14E-07	1.20E-01	9.09E-02	7.08E-02	3.58E-02	1.23E-02	4.61E-03	1.78E-03
6.83E-07	1.01E-01	1.70E-01	1.60E-01	8.07E-02	2.22E-02	8.29E-03	3.20E-03
1.45E-06	8.77E-02	1.76E-01	1.77E-01	9.27E-02	2.51E-02	9.38E-03	3.38E-03
3.06E-06	7.13E-02	1.78E-01	1.92E-01	1.07E-01	2.88E-02	1.09E-02	3.95E-03
6.48E-06	5.57E-02	1.74E-01	2.01E-01	1.20E-01	3.24E-02	1.25E-02	4.68E-03
1.37E-05	4.18E-02	1.64E-01	2.04E-01	1.31E-01	3.55E-02	1.38E-02	5.27E-03
2.90E-05	3.01E-02	1.50E-01	2.02E-01	1.40E-01	3.80E-02	1.50E-02	5.60E-03
6.14E-05	2.07E-02	1.34E-01	1.95E-01	1.47E-01	4.03E-02	1.58E-02	5.71E-03
1.30E-04	1.37E-02	1.18E-01	1.86E-01	1.51E-01	4.27E-02	1.66E-02	5.77E-03
2.75E-04	8.82E-03	1.02E-01	1.77E-01	1.55E-01	4.53E-02	1.75E-02	6.00E-03
5.93E-04	5.64E-03	8.82E-02	1.67E-01	1.57E-01	4.83E-02	1.85E-02	6.50E-03

Figures: Figures may include charts, drawings or depictions, photographs, etc. The proper format for a figure is shown in Figure One. The same rules apply for figures as for tables, **except** the figure number and caption should go below the figure. If a figure needs to be shown in landscape format then the orientation of the figure should be as shown in Figure One with the upper left corner of the figure in the lower left corner of the sheet. Both tables and figures should come as soon as possible after the text that refers to them. An exception to this rule is where the number of figures is high, in which case a section that contains all figures or an appendix devoted to figures should be included.

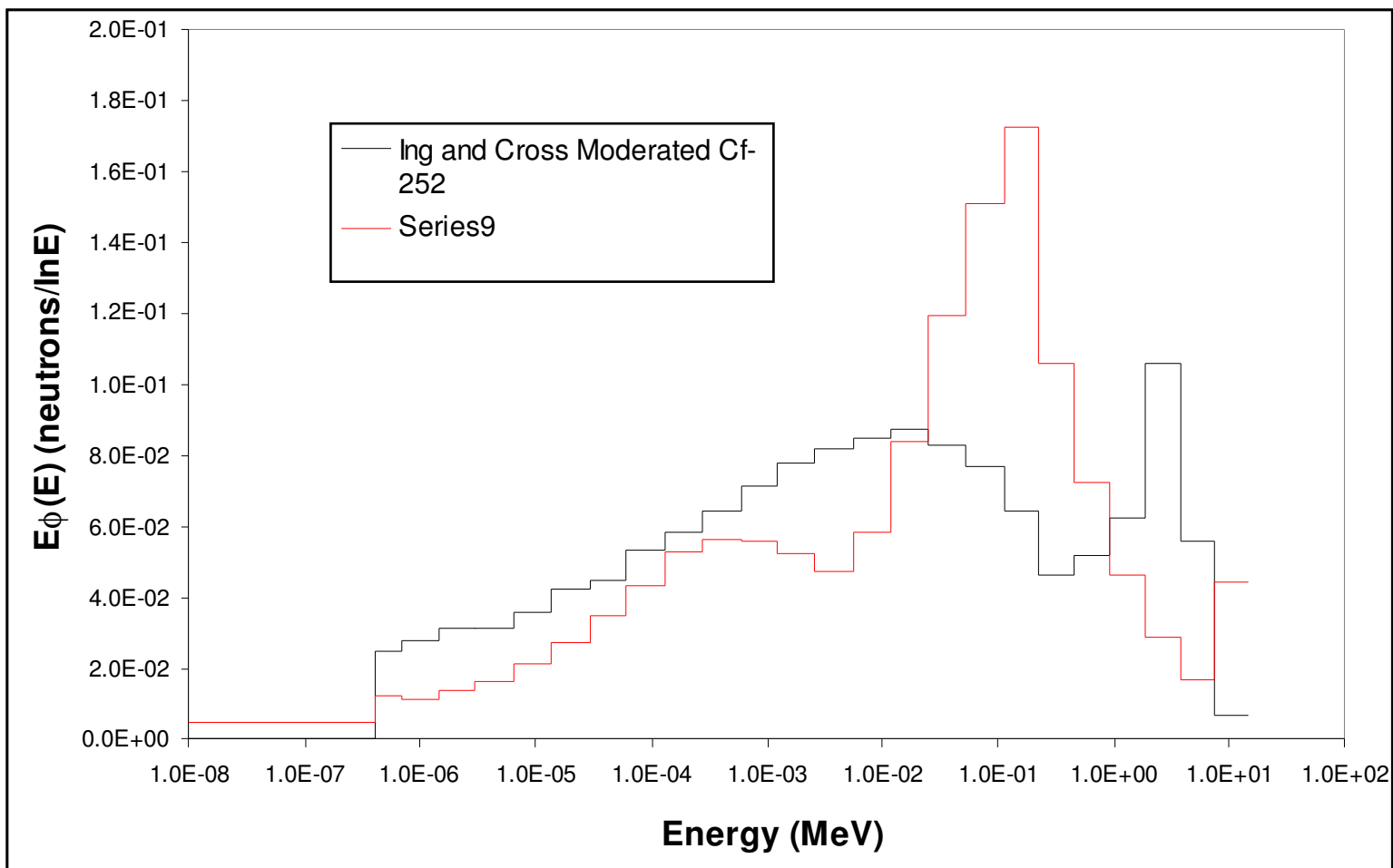


Figure One The initial results of unfolding the heavy-water moderated Cf-252 spectrum with the C++ version of NEWSPEC.

II. Short Engineering Reports

Often times a shorter version of an engineering report is required (after all most people that will “read” the report are very busy). In these cases it is important to transmit the critical portions of your work. Unfortunately, determining what details are critical can be difficult. What you include in a short report depends on who is going to read the report and why. The critical sections of the more formal engineering report (described in section 1) are as follows:

1. Objective of your work,
2. Results of your work,
3. Conclusions.

The objective should be as succinct as possible without omitting important details. The results should also be concise, with special attention given to including only relevant data in the forms of graphs, diagrams and tabulated data. If the results are voluminous it is desirable to place these items in an appendix. Finally, conclusions are very important in a short engineering report, since often decisions will be made based on your recommendations in the conclusions of this report. It will always be necessary to think your conclusions through carefully and it will often be necessary to ask opinions of experienced engineers before final decisions should be made on your recommendations. Usually your supervisor can be helpful in this regard by giving you knowledgeable advice and letting you know more background on the project as it fits into larger projects.

Generally the style rules for the formal engineering report from Section One must be followed for a short engineering report as well.