Final Year Physics Project Final Report

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This is where you should put your abstract. You should try and make your abstract as concise as possible giving the general aims of the investigation as well as the major results. The abstract should be around 50 - 100 words and be able to be read in isolation.

I. ABOUT THIS DOCUMENT

This file provides a basic LaTeX template for the Final Report required for PX402 and PX319 at the University of Warwick. Please feel free to extend the functionality of this template by adding additional packages and settings. However, any definitions regarding the size, font size, margin sizes, etc. should not be changed. However, you can use either single or two column format. The single column format can be achieve by deleting "twocolumn" from the first line of the .tex file.

In the following sections I will try give some of the basics of LaTeX that you're likely to use during writing your report. Whenever I refer to something or you find something you want to use, simply refer to that place in the .tex file. However, there is also a wealth of good resources on the web that can also be used so please feel free to refer to them instead.

One final note, this .tex file contains figures, so you might have a few errors when compiling it as you won't have the picture files in your directory.

This template was original created by Dirk O. Gericke (Warwick) in 2013 and has been edited by Daniel Brunt (2015).

II. INTRODUCTION

The introduction is where you will discuss the overall aims and objectives of your investigation as well giving a general picture of why it is important. You will most likely have to link it back to previously published literature like [1] or you may also have to refer to multiple papers [1–3]. Please note you'll have to compile the document twice before the citations appear. The references should be to literature journals or published books.

References from websites should only be used sparingly and if possible the information from websites should be traced back to the original source.

III. THEORY

The theory section is where you discuss the underlying physics of your project. If you are doing an experimental project, this might include the theory of the experimental technique or data analysis methods you are using, while for a theoretical technique it could be the theoretical approach you are using and developing. For computational, it will ideally be the underlying theory relating to the Physics problem for which your program is being written. Regardless of type of project, there is a good chance your theory section will contain equations. For short equation you can include them in the actual text $\mathbf{F} = m\mathbf{a}$ or if they are larger or more important you might want to give the more space:

$$F(T) = U(T) - T \int_0^\infty d\bar{T}\, \frac{U(\bar{T}) - U(0)}{\bar{T}^2} \tag{1}$$

In addition you are also able to spread an equation across two columns using \begin{widetext} like so:

$$a + b + c + d + e + f + g + h + i + j + k$$

There could be instances that require you to have multiple equations:

$$x_1 = Ay_1 + By_2 + Cy_3\,, \tag{2}$$

$$x_2 = Dy_1 + Ey_2 + Gy_3\,, \tag{3}$$

$$\begin{aligned} x_2 = {} & Hy_1 + Iy_2 + Jy_3 \\ & + Ky_4 + Ly_5 + My_6\,. \end{aligned} \tag{4}$$

You might also have to refer to equations like so Eq. (4). Please note that units should not be in italics (i.e. not between $...$). For instance the surface temperature of the sun is $T = 5700$ K

FIG. 1. This is just an example for a wide figure. If you want to use *.jpg or *.pdf files for your figures, you need to compile with "pdflatex".

IV. RESULTS

This is by far the most important section of your report. It is where you will present the data you have collected during the project. There is no doubt this will be in the form of figures. A general note, you might want to split sections into subsections. This will break your report up and make it easier to read.

A. Figures

Figures should preferably occur at the top or the bottom of the page (although this is not mandatory). Such position can be achieved by using the commands \begin{figure}[t or b] (See the code for an example).

LaTeX can sometimes create spaces between the figure and the caption. This can be compensated for by using \vspace command. You might also have to refer to the figures i.e Fig. IV A.

B. More on Figures

You may at some point have to have a large figure that spans both columns. This can be achieved by using the same environment as before but with an added asterisk (\begin{figure*}). You may also use this environment to combine two related figures (see code for example).

C. Final Note on Figures

This template uses the twocolumn environment, you can also use the multicol environment. If you opt for this please be aware that placing figures into a single column becomes a pain. This is because floats are incompatible with the multicols environment. There are a few ways around this, but I would personally suggest sticking with the twocolumn environment.

	$\mathbf{H} \parallel c$	$\mathbf{H} \perp c$
T_{N1} (K)	5.70(5)	6.00(5)
T_{N2} (K)	7.0(2)	7.20(1)
θ_{CW} (K)	-13.7(4)	-24.5(1)
μ_{eff} (μ_{B}/Nd ion)	10.60(2)	10.32(4)

TABLE I. An example table

D. Tables

It may be necessary to put your results in a table, this is easily done using LaTeXÀn example of which is seen in Table I.

V. CONCLUSIONS

You should be drawing conclusions as you discuss your results but this section acts as a summary. Many people will read the conclusion first to get a feel for the quality of the results, etc. So this can be an important section. Finally if you have any questions please feel free to contact me at the following e-mail address:

D.Brunt@warwick.ac.uk

[1] A. Author, B. Author and C. Author, Journal **vol**, page (year).
[2] D. Author *et al.*, Journal **vol**, page (year).
[3] Original template by Dirk O. Gericke (2013) and edited by Daniel Brunt (2014)