



# STYLE TEMPLATE FOR ABERDEEN ENGINEERING AND A ROUGH GUIDE TO L<sup>A</sup>T<sub>E</sub>X

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## ABSTRACT

This is a tutorial on  $\text{\LaTeX}$  in the style of a thesis. It shows you how to use the UoA Thesis style, and some common formatting elements of  $\text{\LaTeX}$ . Please note, your supervisor is the ultimate authority on the style and formatting of your thesis!

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# NOMENCLATURE

## **Acronyms/Terminology**

MD    Molecular Dynamics, 10

## **Variables/Constants**

$\alpha$     Alpha, 10

## ACKNOWLEDGEMENTS

I would like to dedicate this work to .....

## INTRODUCTION

Welcome to a latex thesis style for engineering students working on their honours project. I'll illustrate how to perform certain cool features of this thesis in the following text.

First thing to note. In order for things such as the table of contents, references, and **nomenclature** to work, you need to run latex multiple times, including running biber (bibliography) and makeindex (nomenclature). The command I use to make the nomenclature is as follows:

```
makeindex thesis.nlo -s nomencl.ist -o thesis.nls
```

How you run these depends on whether you're on windows, Mac, or Linux, so please google "latex nomencl" or "latex biber" and be sure to add the platform (windows/mac/linux) and the editor (e.g., miktex) if you're using one!

The second thing to note is that to start a new paragraph I just leave at least one blank line in the text!

### 1.1 Numbering of Sections, Tables, and Equations

The first major benefit of Latex is that everything is numbered automatically. You don't have to generate a table of contents, figures, references or even a nomenclature. This is all handled automatically.

### 1.2 Mathematical Expressions

An excellent feature of latex is its support for math. For example, we can create an equation like so,

$$y = mx + c. \tag{1.2.1}$$

Notice how the equation is nicely formatted and numbered? Also notice that the equation is punctuated like it is part of the sentence? Referring to the equation number is easy as



well. First, when we make the equation we have to give it a label like so,

$$a = \int c(x)dx. \quad (1.2.2)$$

Then, in the text we can refer to it just by typing Eq. 1.2.2 (see the thesis.tex file for what was actually was done).

We can put labels anywhere, in figures, tables, chapters wherever, and use the ref command to refer to them. For instance, this section is Sec. 1.2. Notice the label just after the section command above?

We can also write math inline. So for example I might say, our first function is  $y = mx + c$ .

There are a million math commands, so please take a look at the AMS math package manual for more information. Here is an impressive equation to show off the features,

$$\left( \frac{\partial}{\partial t} + \sum_j^n \left[ i\mathcal{L}_j^0 - \sum_{k>j}^n \mathcal{T}(j,k) \right] \right) f(\Gamma_1, \dots, \Gamma_n, t) \\ = \sum_{j=1}^n \int d\Gamma_{n+1} \mathcal{T}(j, n+1) f(\Gamma_1, \dots, \Gamma_{n+1}, t). \quad (1.2.3)$$

## 1.3 Adding Figures

To add figures to your text, you need to use a series of commands, but you can just copy paste the one below and tweak it for your needs.

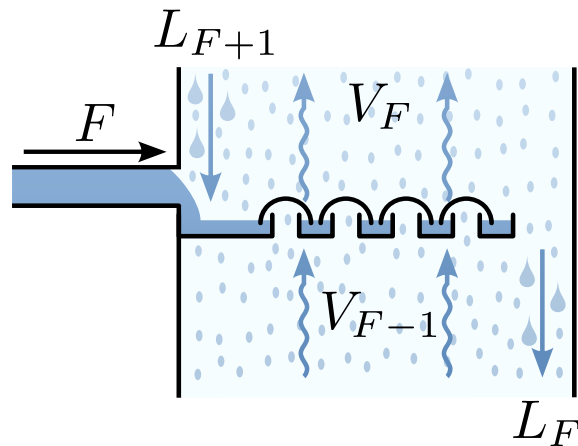


Figure 1.1: A test figure. This caption is far too short. It should explain where the figure came from and exactly what it presents. Note how only a “short” single-sentence caption appears in the table of figures though.

I can refer to this figure (Fig. 1.1) using the ref command again, provided I’ve placed a label in the caption. But notice how I don’t get to choose where it is placed? I can only give hints, via the [htp] option (which means either place it [H]ere, at the [T]op of the page, or a whole [P]age). Latex is free to place it where it thinks best. It knows better

than you how to place figures too. If they're not looking too good, maybe you have too little text, or the figure is too wide/high. Remember, the text in the figure should at least be as large as the text in the document, so don't shrink those graphs too much.

The figure used here was drawn in Inkscape, an excellent free drawing programme. Remember to save your images as PDF, and avoid using jpg/png wherever possible (to keep the nice crisp vectorised graphics).

The one time we can be forceful about a figure is when we want it placed on its own page by using the [p] placement. But if we're doing a full-page figure we might want it rotated too to make sure we fully use the space. See Fig. 1.2 for an example.

## 1.4 Formatting Text

You can format text in latex, but **please use it sparingly!**. The results *aren't always pleasant*. Use it only when you really want to.

## 1.5 Using a Nomenclature

To use a nomenclature you must add extra commands throughout your text whenever you define a new term. For example, a handy acronym is MD .

The nomenclature command has 3 arguments. The last argument is the description of the symbol/acronym. The second argument is the symbol/acronym. The first is the type of entry it is (A=acronyms, O=operator, V=Variables/Constants, S=Notation, and F is functions), followed by a space then the alphabetical version of the term. For example, if I wanted to define a greek symbol such as  $\alpha$  , I would need to write alpha here.

## 1.6 Tables

Tables are made in the following way...

Just after the begin tabular command, the number of columns and their alignments are selected. p means the column is a fixed width paragraph, l c and r are a left aligned, centered and right aligned columns respectively. The pipe character | adds vertical lines between columns. Horizontal lines are added using hline commands in the table itself.

We can also make full-page sideways tables when there is a lot of data to present (see Table. 1.2)

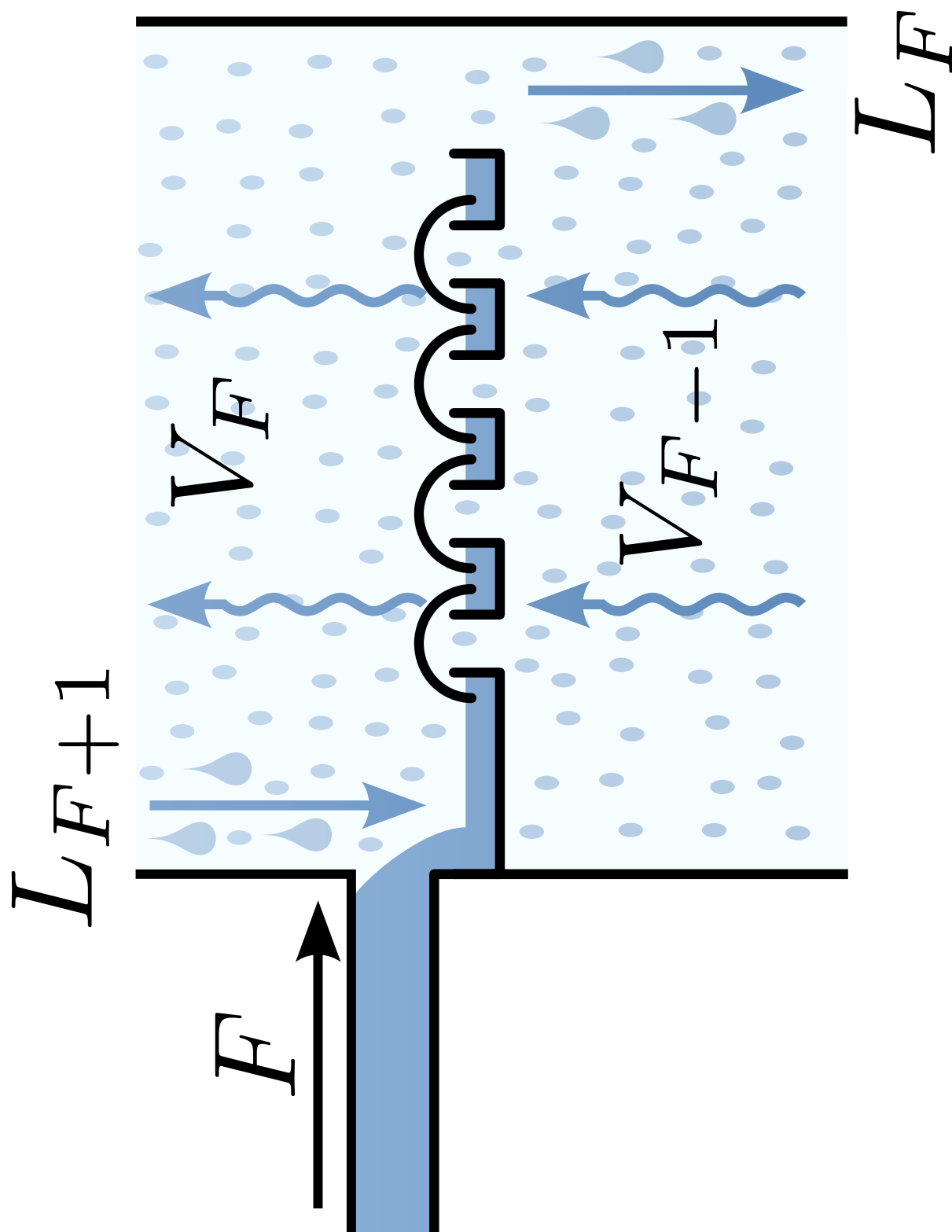


Figure 1.2: A full page test figure and even the caption is rotated!.

Surface	$\varepsilon$	Surface	$\varepsilon$
Asbestos, Board	0.96	Carbon, Candle soot	0.95
Water	0.95–0.96	Carbon, Lampblack	0.95
Iron and steel, rough	0.94–0.97	Brick, Red, rough	0.93
White enamel paint	0.906	Iron and steel	0.74
Iron and steel, Sheet	0.657	Oxidised Lead	0.28
steel, oxidised			
Iron and steel, Polished	0.14–0.38	Rough Aluminium	0.06
iron			
Polished Aluminium	0.04	Highly polished Gold	0.02–0.35

Table 1.1: Typical values of the emissivity for various materials, taken from Coulson & Richardson, Vol. 1, Fig. 9.40.

## 1.7 Footnotes

Footnotes are really easy to do<sup>1</sup>.

## 1.8 Referencing and Generating

You can reference entries in your bib file using the key you have set for it like so [1]. I can even do cool things like say the author of that citation is Bannerman and it was published in 2009. Or even ask for a full citation, like so: M. N. Bannerman. “Discrete potentials are good”. In: *J. M. B.* 1 (2009), pp. 1–100.

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<sup>1</sup>And you can even put mathematics (even figures and tables) in them

$$f = mx + c \tag{1.7.1}$$

Just don’t go crazy and write paragraphs and paragraphs of text in them.

Surface	$\epsilon$	Surface	$\epsilon$
Asbestos, Board	0.96	Carbon, Candle soot	0.95
Water	0.95–0.96	Carbon, Lampblack	0.95
Iron and steel, rough	0.94–0.97	Brick, Red, rough	0.93
White enamel paint	0.906	Iron and steel	0.74
Iron and steel, Sheet steel, oxidised	0.657	Oxidised Lead	0.28
Iron and steel, Polished iron	0.14–0.38	Rough Aluminium	0.06
Polished Aluminium	0.04	Highly polished Gold	0.02–0.35

Table 1.2: Typical values of the emissivity for various materials, taken from Coulson &amp; Richardson, Vol. 1, Fig. 9.40.

## A LITTLE FURTHER DOWN THE RABBIT HOLE

**W**HY stop there? There are some lovely features of latex we can use, like the lettrine at the start of this chapter. Or the epigraph at the start of the next section!

### 2.1 Epigraphs

*“Epigraphs are cool!”*

M. Campbell Bannerman

You can use epigraphs to include relevant information, such as quotes or information on where the section/chapter was published.

### 2.2 Hyperlinks

Finally, we can even take advantage of the digital nature of our document and include hyperlinks. This entire sentence ([try clicking it](#)) is linked to my own website.

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CHAPTER  
**THREE**

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REFERENCES

- [1] M. N. Bannerman. “Discrete potentials are good”. In: *J. M. B.* 1 (2009), pp. 1–100.