LIM LIAN TZE, PH.D.

A LaTeX CLASS & TEMPLATE FOR UPNM THESES

VERSION 1.0   OCTOBER 20, 2015

✉ LIANTZE@GMAIL.COM
🌐 HTTP://LIANTZE.PENGUINATTACK.ORG/

upnmthesis is a LaTeX class for authoring theses that fulfil formatting specifications required by Universiti Pertahanan Nasional Malaysia (UPNM). This class and template was commissioned by the university's Centre of Graduate Studies in October, 2015, for both undergraduate and postgraduate theses.

A sample ⬚ sample-thesis.tex, as well as relevant sample chapters, are included in the package, which I recommend you modify for your own thesis write-up. (You can rename it, but I'll stick with the file name 'sample-thesis.tex' throughout this guide.)

The latest version of this template can be downloaded from http://liantze.penguinattack/latextypesetting.html#upnmthesis.

upnmthesis is available as a template on Overleaf.

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Setting Up

1.1   Compiling the Template the Easy Way

You may want to consider writing your thesis in the cloud, so that you won't have to maintain your own local LaTeX installation or setting up the processing tools.

There are now a number of LaTeX cloud editing platforms, e.g. Overleaf, ShareLaTeX, Authorea, etc. The UPNM thesis template is available on Overleaf.

1.2   Configuring TeXworks to Compile `upnmthesis`

Assuming TeXworks is your LaTeX editor of choice, you will probably want to configure it so that you can process your glossary and list of own publications from within TeXworks. You should work through this section to ensure that you are able to compile the sample thesis successfully.

(You can always, of course, opt to run the relevant commands from the command line prompt, or adapt these configurations for other editors and operating systems.)

1.2.1   Tool Configuration for Generating the List of Acronyms

Access the TeXworks menu Edit ⟩ Preferences ⟩ Typesetting . Add a new processing tool called 'List of Acronyms'. Configure it as shown in Figure 1.1 (p.5).

On Linux and Mac systems, this is equivalent to the command line

```
$  makeindex -s <basename>.ist -t <basename>.alg -o <basename>.acr <basename>.acn
```

where `<basename>` is the name of your main file (i.e. `sample-thesis`).

1.2.2   Tool Configuration for Generating the List of Publications

Add another processing tool called "Publication List". Configure it as shown in Figure 1.2 (p. 1.2). On Linux and Mac systems, this is equivalent to the command line
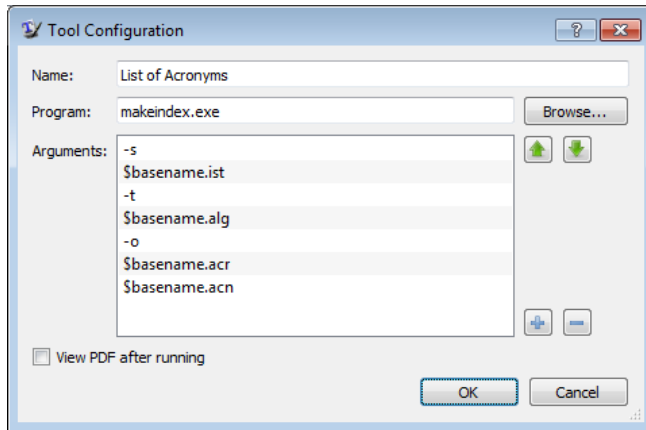
```
$  bibtex own
```

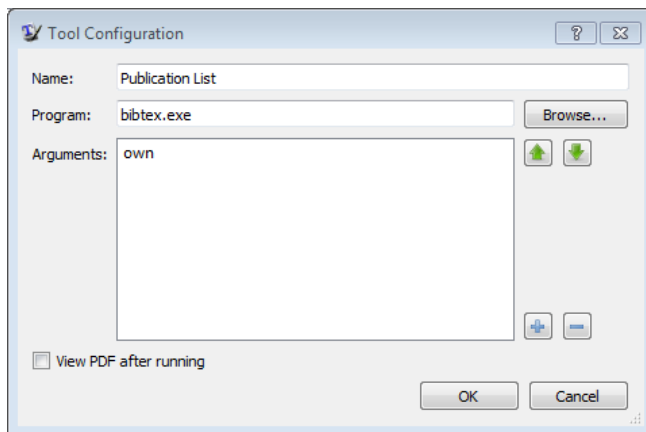*Figure 1.1: Setting up the 'List of Acronyms' processing tool in TeXworks*

Figure 1.2: Setting up the 'Publication List' processing tool in TeXworks

1.2.3   Compiling `thesis.tex`

When using TeXworks, the processing tools should be run on `thesis.tex` in the following sequence:

1. pdfLaTeX + BibTeX + Makeindex
2. List of Acronyms
3. Publication List
4. pdfLaTeX + BibTeX + Makeindex

</> Compilation steps

You will need to run 'List of Acronyms' again if you add and use a new acronym. Similarly, run 'Publication List' again if you add a new self publication. Don't forget to run 'pdfLaTeX + BibTeX + Makeindex' after that!

1.2.4   Why is there a blank page before the title page and at the end?!

The thesis preparation guidelines say there needs to be a blank page between the cover and the title page, and another at the very end, so upnmthesis forces one just in case you forgot to insert one. ☺

?! What, blank pages?!

1.2.5   Printing from Acrobat Reader

Remember to set the **paper size** to **A4** and **page scaling** to **None** in the Print dialog, otherwise the margins would be incorrect.

🖶 Make sure the print out isn't shrunk!

2
Using the Template

We'll now look at how you can modify the template LaTeX files to suit your own thesis.

2.1 *Document Class Options*

To 'activate' the class, make sure your main document file (e.g. `sample-thesis.tex`) starts off with `\documentclass{upnmthesis}` . This will set up the page margins, paragraph spacing, indents, page numbers, font face and size, content list and section headings, citation and bibliography format, amongst other things.

There are three options that you can pass to the document class declaration:

All three options are off as default.

undergrad If you're writing an undergraduate thesis. There will then be no exam committee approval, even if you have specified `examcommapproval` – see section 2.3.5. and the wordings of the supervisory committee approval will be different.

Remember to specify your `\faculty` and `\bachprogramme` if using this option.

newtx Loads the `newtxtext` and `newtxmath` font packages if these packages are installed; they have nicer math fonts. Otherwise `math-ptmx` will be loaded as default.

microtype Even nicer typographic output! Reduces chances of hyphenation but *sometimes* (though rare) may cause an endless loop as the typesetting engine tries to find an optimal line break.

2.2 *List of Abbreviations*

To facilitate automatic sorting and expansion of abbreviations, `upnmthesis` uses the `glossaries` package. Preferably, the list of abbreviations and symbols are defined in a separate ⬒ `myacronyms.tex`, and included in the thesis just after `\begin{document}` :

```
\input{myacronyms}
```

⬒ `myacronyms.tex` can contain abbreviation/acronym definitions that take the form of
```
\newacronym{label}{abbreviated form or symbol}{full form} :
```

```
\newacronym{LI}{LI}{lexical item}
%% need to specify plural forms explicitly, otherwise
%% will come out as "part of speechs"
\newacronym[firstplural={parts of speech (POS)},
    plural={POS}]{POS}{POS}{part of speech}
\newacronym{NLP}{NLP}{Natural Language Processing}
\newacronym{theta}{$\theta$}{temperature degree}
```

Only abbreviations that are actually called in the main text via `\gls` and related commands,will be printed in the List of Abbreviations.

section 1.2.1

`\printacronyms` , section 2.3.6

2.3   Front Matter

`\frontmatter` marks the start of the thesis front matter – i.e. everything before your first chapter. This includes the cover page, title page, dedication (optional), acknowledgements, English and Malay abstracts, approval forms, declaration form, and content lists.

2.3.1   Information about Your Thesis

Modify the following lines in the template to suit your own thesis. These information will be used to generate the cover and title pages, as well as various forms in the thesis. Don't forget to specify your `\faculty` and `\bachprogramme` if you have specified the undergrad document option.

```
\author{Your Name}
\title{Your Thesis Title}
\degree{Your Degree (e.g. Doctor of Philosophy)}

%% If Bachelor programme, you'll need to uncomment
%% and specify the following two lines
% \bachprogramme{Chemical Engineering}
% \faculty{Faculty of Engineering}
\submissionyear{2011}
\submissionmonth{October}
\vivadate{25 August 2011}
```

2.3.2   Cover and Title Pages

`\makecoverandtitlepage` generates the cover page, a blank page, and then the title page, using the information you've provided.

The 'cover page' is the hard cover, while the title page is printed on a plain A4 paper.

2.3.3   Dedication & Acknowledgements

You can create an optional dedication page with

Dedications are usually short.

```
\dedication{To my parents.}
```

On the other hand, the acknowledgements section is likely to be longer – so I've put it in 🗀 `acknowledgements.tex` as a sample:

```latex
\begin{acknowledgements}
Thanks guys. I owe you many.
\end{acknowledgements}
```

2.3.4   Abstracts

Write your abstracts in separate files . These files do not need to contain any headings – only the abstract text is needed.

Include them in 🗀 `sample-thesis.tex` like this:

🗀 `sample-abstract.tex` for the English abstract and 🗀 `sample-msabstract.tex` for the Malay abstract in this example

```latex
\abstractfromfile{sample-abstract}
\msabstractfromfile{sample-msabstract}
```

2.3.5   Approval and Declaration Forms

If you are writing a postgraduate thesis (default mode), you will need two approval forms: one from the *Examination Committee*, and one from the *Supervisory Committee*. Examination Committee approval is not required for undergraduate theses.

i.e. if you used `undergrad` class option.

To produce the Examination Committee approval form, you'll need to specify the committee `\member` s (Chairman, the two Internal Examiners and the External Examiner) in the `examcommapproval` environment:

The `examcommapproval` environment will be ignored if you have specified the `undergrad` class option.

Default values for `\member` keys, if you do not explicitly define them:
title (empty)
department (empty)
institute Universiti Pertahanan Nasional Malaysia
role Member

```latex
\begin{examcommapproval}
  % Exam Committee Chairman
  \member[title=Professor,
      department={Faculty of Mathematics},
      role={Chairman}]
  {Name of Chairperson, PhD}
  % Internal Examiner 1
  \member[title=Associate Professor,
      department={Faculty of Engineering},
      role={Internal Examiner}]{Name of Examiner 1,
      PhD}
  % Internal Examiner 2
  \member[title={},
      department={Faculty of Engineering},
      role={Internal Examiner}]{Name of Examiner 2,
      PhD}
  % External Examiner
  \member[title=Associate Professor,
      department={School of Chemical Engineering},
      institute={Imperial College},
      role={External Examiner}]{Name of External, PhD}
\end{examcommapproval}
```

The Supervisory Commitee approval is created in a similar manner, using the `supervisoryapproval` environment.

The wording for Supervisory Commitee approval will be generated differently for postgraduate and undergrad theses.

```
\begin{supervisoryapproval}
  % Supervisory Committee Chairman
  \member[title={Associate Professor},
      role={Chairman},
      department={Faculty of Engineering}]
    {Name of Chairperson, PhD}
  % Supervisory Committee Member 1
  \member[title={Ir.}, department={Faculty of
      Engineering}]{Name of Member 1, PhD}
  % Supervisory Committee Member 2
  \member[department={Faculty of Engineering}]
    {Name of Member 2, PhD}
\end{supervisoryapproval}
```

`\declarationpage` generates the thesis declaration page. Remember to get all these pages signed before submission.

2.3.6   Content Lists

The table of contents, list of tables, list of figure, list of appendices and list of abbreviations are generated by the following lines.

```
{\clearpage\SingleSpacing
\tableofcontents*\clearpage
\listoftables\clearpage
\listoffigures\clearpage
%% Comment out the following line if you have two or
%% less appendices
% \listofappendices\clearpage
\printacronyms\clearpage
}
```

Note that you should leave `\listofappendices` commented if you have two or less appendices. Conversely, if you have three appendices or more, you should uncomment it, so that a separate list of appendices can be generated.

A single item 'Appendices' will then be added to the table of contents.
If `\listofappendices` is issued, the item 'Appendices' will not appear in the table of contents.

2.4   Main Chapters

I highly recommend that each chapter be written in a separate file. For example, 🗀 `sample-chap-intro.tex` may have the contents

The `!TEX ROOT` directive indicates to TeXworks (and also TeXshop on the Mac) that 🗀 `sample-chap-xxx.tex` are 'sub-files' of 🗀 `thesis.tex`.
   This means if you hit `Ctrl`+`T` when you are editing 🗀 `chap-xxx.tex`, 🗀 `sample-thesis.tex` will get compiled instead.

```
%!TEX ROOT=sample-thesis.tex
\chapter{Introduction}
This is the introduction chapter.

\section{Problem Background}
```

```
We study the...
```

And 🗋 `sample-chap-litreview.tex`:

```latex
%!TEX ROOT=sample-thesis.tex
\chapter{Literature Review}
We review the state of the art in...

\section{Early Approach}
Researchers first attempted to...
```

In 🗋 `sample-thesis.tex`, these chapter files are included with the following lines:

```latex
\mainmatter         % signal start of main chapters
\input{sample-chap-intro}
\input{sample-chap-litreview}
\input{...}
```

2.4.1   Typesetting the Text

Sections, subsections, graphics files, figures, tables, itemize and enumerated lists, etc are created using the standard LaTeX commands. See 🗋 `sample-chap-intro.tex` for some examples, including how to create subfigures (and by extension, subtables).

2.4.2   About Subsections

Subsections need to be indented, so remember to surround your subsections with `\begin{subsecs}...\end{subsecs}` like this:

```latex
\section{Discussion}
We will highlight...

\begin{subsecs}
\subsection{First Issue}
...
\subsection{Second Issue}
...
\end{subsecs}

\section{Next section}
...
```

2.4.3   Citatons and Bibliography

Citations and bibliography are done using BibTeX, adopting the APA style. Both `natbib` and `apacite` commands can be used – in most cases you'll just need the following:

```
\cite{John:2004}              ⟶  John (2004)
\citep{John:2004}             ⟶  (John, 2004)
\citet{John:2004}             ⟶  John (2004)
\citep[p.5]{John:2004}        ⟶  (John, 2004, p.5)
\citep[see also][p.5]{John:2004}  ⟶  (see also John, 2004, p.5)
\citeauthor{John:2004}        ⟶  John
\citeyear{John:2004}          ⟶  2004
```

2.4.4   Calling Abbreviations

Use **\gls** and related commands to call abbreviations that you previ-
ously defined in 🗁 `myacronyms.tex`. On first mention, the full form
will be displayed, and on subsequent mentions, the short form will be
used. For example:

```
\gls{LI} (first use)          ⟶  lexical item (LI)
\Gls{LI} (first use)          ⟶  Lexical item (LI)
\glspl{LI} (first use)        ⟶  lexical items (LIs)
\gls{LI} (subsequent uses)    ⟶  LI
\glspl{LI} (subsequent uses)  ⟶  LIs
\glspl{POS} (first use)       ⟶  parts-of-speech (POS)
```

A custom plural form was specified for
POS, so we get 'parts-of-speech' instead of
'part-of-speech'

Note that only abbreviations that have actually been used via **\gls**
etc will appear in the List of Abbreviations.

2.5   Back Matter

The back matter starts when the final main chapter has ended. It con-
sists of the bibliography, appendices, publication list and biodata. *How-
ever note that the* **\backmatter** *command should not be used.*

2.5.1   Bibliography

The bibliography file is a standard BibTEX `.bib` file – a standard
\bibliography{sample} is sufficient.

2.5.2   Appendices

Similar to the main chapters, it is recommended to put each appendix in
its own file.

```
\begin{appendices}
\input{sample-appen-manual}
\input{sample-appen-try}
\end{appendices}
```

2.5.3   Biodata

Write your personal biodata in the `biodata` environment. This can go
into a separate 🗁 `biodata.tex`, which is later **\input** –ed.

```
\begin{biodata}
Put your personal biodata as required here.
\end{biodata}
```

2.5.4   Publication List

First, make sure that you enter details about your own publications in your BibTEX file, 🗋 myrefs.bib file. Then in 🗋 sample-thesis.tex, list the keys of your publications in **\nociteown**, and display the publication list using **\bibliographyown** :

You can list your publications in a different .bib file – just remember to pass in the correct file name to **\bibliographyown** .

```
\nociteown{Lim:2009,Bond:etal:WordNetBahasa:2014,Lim:etal:2014,Lim:etal:acl:lookup}
\bibliographyown{myrefs}
```

The publication list sorts entries according to the APA requirements by default, i.e. based on the first authors' last names. This may not be what you want, e.g. you may want to sort your publications chronologically. In this case, we can force APA to sort by a custom key, using the **\APACSortNoop** command. For example, the following will sort by chronological order of the publication date:

Note that the **\APACSortNoop** command should be placed just before the *last name* of the first author.
   You may define the custom value differently if you want to sort by reverse chronological order.

```
@ARTICLE{Bond:etal:WordNetBahasa:2014,
   author={{\APACSortNoop{2014}}Bond, Francis and Lim,
       Lian Tze and Tang, Enya Kong and Riza, Hammam},
   year={2014},
   ...
}


@INPROCEEDINGS{Lim:etal:acl:lookup,
   author = {{\APACSortNoop{2013}}Lim,Lian Tze and
       Lay-Ki Soon and Tek Yong Lim and Enya Kong Tang
   and Bali Ranaivo-Malan\c{c}on},
   year = {2013},
   ...
}


@ARTICLE{Lim:etal:2014,
   author = {{\APACSortNoop{2014}}Lim, Lian Tze and
       Soon, Lay-Ki and Lim, Tek Yong and Tang, Enya
       Kong
   and Bali Ranaivo-Malan\c{c}on},
   year = {2014},
   ...
}
```