

THE UMALAYATHESIS L^AT_EX DOCUMENT CLASS

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**INSTITUTE OF POSTGRADUATE STUDIES
UNIVERSITY OF MALAYA
KUALA LUMPUR**

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**THESIS SUBMITTED IN FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

**INSTITUTE OF POSTGRADUATE STUDIES
UNIVERSITY OF MALAYA
KUALA LUMPUR**

2017

UNIVERSITI MALAYA

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THE UMALAYATHESIS L^AT_EX DOCUMENT CLASS

ABSTRACT

An abstract must not exceed 500 words, typed in a single paragraph with double-spacing, and written in Bahasa Malaysia and English language. A maximum of five (5) keywords should also be listed below the abstract.

Keywords: Keyword, keyword, keyword, keyword.

ABSTRAK

Ini merupakan abstrak dalam Bahasa Melayu (satu perenggan).

ACKNOWLEDGEMENTS

Thanks guys. I owe you many.

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LIST OF SYMBOLS AND ABBREVIATIONS

θ : temperature degree.

LI : lexical item.

NLP : Natural Language Processing.

POS : part of speech.

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CHAPTER 1: HOW TO USE UMALAYATHESIS TO WRITE YOUR THESIS

umalayathesis is a L^AT_EX class for authoring theses that fulfil formatting specifications required by Universiti Malaya (UM), Malaysia. The thesis preparation guide can be accessed at <http://bit.ly/2xaYpzN>.

1.1 Files

Here's a quick list of the files required when writing your thesis with the umalayathesis class. Easiest way to go about things is to put all the files in the same directory. (See Chapter 1.4 for more details.)

- **umalayathesis.cls**, the L^AT_EX class file implementing the UM thesis formatting requirements.
- A “main driver” .tex file of your thesis, analogous to `int main()`. You can name this file anything you like; it is known as `thesis.tex` in this guide. (See 1.4.)
- Two .tex files containing your thesis abstract, in English and Bahasa Malaysia. (See 1.4.5.)
- .tex files containing your thesis chapters and appendices, one chapter per file. (See 1.4.7 and 1.4.8.)
- A .bib file containing your references and publications. (See 1.4.9).
- A .tex file containing your glossary. (See 1.4.11).

1.2 Compiling thesis.tex

The following processing tools/commands are triggered automatically on Overleaf as you edit your file, but you must execute them manually if compiling on your own machine.

(The \$ is the terminal command prompt; don't type that!)

```
$ pdflatex thesis
$ bibtex thesis
```

```
$ makeglossaries thesis <-- if you have acronyms and glossaries
$ makeindex thesis <-- if you have indices
$ pdflatex thesis
$ pdflatex thesis
```

You will need to run `makeglossaries` again if you add and use a *new glossary or acronym entry*.

If you do not have Perl installed on your system (Mac and GNU/Linux systems are likely to already have Perl installed), then you should execute the following commands to replace `makeglossaries`:

```
$ makeindex -s thesis.ist -t thesis.glg -o thesis.gls thesis.glo
$ makeindex -s thesis.ist -t thesis.alg -o thesis.acr thesis.acn
```

1.3 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.

1.4 Using the `umalayathesis` Class

1.4.1 Activation

To ‘activate’ the class, make sure your main document file (e.g. `thesis.tex`) starts off with `\documentclass{umalayathesis}`:

```
\documentclass{umalayathesis}
\usepackage{graphicx}
\usepackage{... other packages you need}
```

This will set up the page margins, paragraph spacing, indents, page numbers, font face and size, citation and bibliography format, amongst other things.

(There is an experimental `bahasam` document class option that sets up everything for Bahasa Malaysia; but at present `apacite` has not yet been localised to Bahasa Malaysia yet.)

1.4.2 Author Information

You need to provide some author information in the preamble. Example lines from `thesis.tex`:

```
\author{Lim Lian Tze}
\title{My Ground-breaking Research}
\faculty{Faculty of Amazing Research}
\submissionyear{2012}
\degree{Doctor of Philosophy}
```

These information are needed to generate the preliminary pages.

1.4.3 Preliminary Pages

Once in the main document body, `\frontmatter` sets up the, well, front matter. This include setting the page numbers to lower-case Roman numerals.

`umalayathesis` can generate the cover page, title page and original literary work declaration page with the following lines (included in `thesis.tex`):

```
% \makecoverandtitlepage{\mastercoursework}
% \makecoverandtitlepage{\mastermixedmode}
% \makecoverandtitlepage{\masterresearch}
\makecoverandtitlepage{\doctoralresearch}
% \makecoverandtitlepage{\doctoralmixedmode}
\declarationpage
```

Please *uncomment* the correct `\makecoverandtitle` line to generate the correct statement on the title page.

1.4.4 Acknowledgements

This is provided using `\acknowledgements`:

```
\acknowledgements{I would like to thank my parents, my family, my
supervisor...}
```

1.4.5 Abstract

Write your abstracts in separate files (`sample-abstract.tex` for the English abstract and `sample-msabstract.tex` for the Malay abstract in this example), and include them in `thesis.tex` like this:

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

1.4.6 Table of contents, List of figures and tables

These are auto-generated by the following lines (included in `thesis.tex`):

```
{\clearpage\SingleSpacing  
\tableofcontents\clearpage  
\listoffigures\clearpage  
\listoftables\clearpage}
```

1.4.7 Main Chapters

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

```
\chapter{Introduction}  
This is the introduction chapter.
```

```
\section{Problem Background}  
We study the...
```

And `chap-litreview.tex`:

```
\chapter{Literature Review}  
We review the state of the art in...
```

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

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


```

\mainmatter           % signal start of main chapters
\input{chap-intro}    % no .tex extension!
\input{chap-litreview}
\input{...}

```

1.4.8 Appendices

Again, I recommend keeping each appendix chapter in its own file e.g. app-uml diagram.tex:

```

\chapter{UML Diagrams}
...

```

And in thesis.tex:

```

\appendix % signal start of appendices
\input{app-uml diagram}
\input{...}

```

1.4.9 Citations and Bibliography

umalayathesis uses the apacite package to format citations and bibliography in the APA style. Here are some useful variants of the \cite command; see the apacite manual for full list.

- \cite{Lim:2009} → (Lim, 2009)
- \citeA{Lim:2009} → Lim (2009)
- \citeNP{Lim:2009} → Lim, 2009 (no parenthesis)
- \cite<see>[p.~7]{Lim:2009} → (see Lim, 2009, p. 7)
- \citeauthor{Lim:2009} → Lim
- \citeyear{Lim:2009} → (2009)

In thesis.tex, these lines will print the bibliography list:

```

\backmatter % signal start of back matter
\bibliography{bibfile} % bibliography file name without .bib extension

```

1.4.10 List of Publications

First, make sure that you enter details about your own publications in your .bib file.

Then in thesis.tex, search for the following line:

```
\nociteown{Lim:2009}
```

Replace the BibTeX key between the curly braces with that of your own publication. If you have more than one publications, simply separate them with commas inside the curly braces, like this:

```
\nociteown{lim:tang:2004,Lim:2009}
```

1.4.11 Glossary

You can maintain a consistent glossary and acronym list using the glossaries package.

It also supports acronym expansion on first mention!

First, define your acronyms and terms in a separate file e.g. myacronyms.tex:

```
% \newglossaryentry{label}{name={term},description={explanation}}
\newglossaryentry{lexicon}{
name={lexicon},
description={The vocabulary of a language, including its words and
expressions. More formally, it is a language's inventory of
lexemes}
}

% \newacronym[description={explanation}]{label}{abbrv}{full form}
\newacronym
[description={single word or words that are grouped in a language's
lexicon}]
{LI}{LI}{lexical item}

\newacronym[description={The application of computational linguistics
principles to problems}]
{NLP}{NLP}{Natural Language Processing}

% when the plural form is irregular, specify firstplural and plural
\newacronym
[firstplural={parts of speech}, plural={POS},
description={linguistic category of lexical items}]
{POS}{POS}{part of speech}
```

Loading the glossary and acronym list, and later printing the list of acronyms and glossary in thesis.tex:

```
% Must be loaded BEFORE \begin{document}!
\loadglsentries{myacronyms}
\begin{document}
...
% List of acronyms is between list of tables and list of appendices
\listofacronyms\clearpage
...
\bibliography{bibfile}
% Glossaries is placed AFTER the bibliography
% (only entries that are actually used in the text will be listed)
\printglossary
...
```

To mention them in the text (i.e. chap-xxx.tex etc):

Let's talk about \acp{LI} and \acp{POS} in \ac{NLP}. I mention again \acp{LI}. We will also talk about \glsplural{lexicon}.

Notice how the acronyms are expanded on first use, as well as the use of \glsplural and \acp for plurals:

Let's talk about lexical items (LIs) and parts of speech (POS) in Natural Language Processing (NLP). I mention again LIs. We will also talk about lexicons.

You will need to run pdf_latex, makeglossaries, then 2 more runs of pdf_latex for the glossaries to appear properly.

Use \Gls, \Glsplural, \Ac, \Acp etc. if you need to capitalise the first letter of your terms at the beginning of sentences.

CHAPTER 2: INTRODUCTION

2.1 First Level Heading

You can use the usual \LaTeX commands and environments: footnotes¹ too², certainly with figures and tables as well.



Figure 2.1: First figure. OK?

Table 2.1: This is a table.

Hey	How's it	Going?
Fine!	Just great.	See ya!
Fine!	Just great.	See ya!

This is a quotation:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla.

You can create subfigures (and similarly subtables.)

¹ See here, how weird, how to fill out an entire line. See here, how weird, how to fill out an entire line. See here, how weird, how to fill out an entire line. See here, how weird, how to fill out an entire line. See here, how weird, how to fill out an entire line.

² don't you agree?



(a) This is a subfigure



(b) This is another subfigure

Figure 2.2: Second figure. If you have a citation in the caption, you might want to provide an optional caption that doesn't contain the citation so that it won't appear in the List of Tables or Captions. (Audibert, 2004)

Table 2.2: A trivial subtable example

One	Two
Three	Four
Five	Six

α	β
γ	δ
ϵ	ζ

2.1.1 Suggestions about Tables

\LaTeX tables can be notoriously... *interesting* to do. But whatever you do, **please don't nest tabulars** i.e. put tabulars within tabulars. They are hard to read and debug, and prone to errors.

<http://www.tablesgenerator.com> is a handy tool, where you can design your tables and then export the \LaTeX code. You can even paste in some data you copied from Excel via the 'File > Paste table data' function.

For tables/columns that are too wide to fit nicely on the page, see this blog post for some suggestions: <http://tex.my/how-to-deal-with-wide-tables/>

For tables that are too long and must be broken up into multiple pages, use the `longtable` or `supertabular` packages: these have mechanisms for automatically breaking the tables, and repeating the table header/footer rows on each page. Click here for a `longtable` example, which is reproduced in Table 2.3. Table 2.4 shows a `supertabular` example.

2.1.2 Suggestion about Itemize and Enumerate Lists

umalayathesis v1.3 loads the `enumitem` package, which provides some mechanisms for customising lists.

If the space above the `itemize` and `enumerate` lists are too big for your liking:

- This is the first point and
- This is the second point

You can use the `nosep` option:

- This is the first point and
- This is the second point

To use a different bullet:

- ★ This is the first point and
- ★ This is the second point

And even different numbering scheme:

- (i) This is the first point and
- (ii) This is the second point

Other possible commands for changing the counter format are:

- `\arabic:` 1, 2, 3, ...
- `\roman:` i, ii, iii, ...
- `\Roman:` I, II, III, ...
- `\alph:` a, b, c, ...
- `\Alph:` A, B, C, ...

2.2 Citations

`umalayathesis` uses the `apacite` package and bibliography style. Use `\cite` for parenthetical citations, such as this one (Audibert, 2004). (Budanitsky & Hirst, 2006). To get text citations, use the `\citeA` command and you'll get (Audibert, 2004).

2.2.1 ★★ A Note about the APA Citation Format ★★

`umalayathesis` uses the `apacite` package and bibliography style, which fully implements the APA6 guidelines. The APA6 guidelines can be rather complex with lots of subtleties, so some questions about this style comes up every once in a while. Therefore this is important: **Please read this blog post first. Now.**

<http://tex.my/why-is-latex-doing-all-the-apa-citations-wrong/>

Back? Have you really read it? Not really? Please go read it first. :-)

Now this is the first citation of a source with $3 \leq \text{authors} \leq 5$; per APA6 requirements, all authors will be listed. (Azarova, Mitrofanova, Sinopalnikova, Yavorskaya, & Oparin, 2002). Great! Let's cite it again, and this time per APA6 requirements, only the first author followed by et al. will be displayed: (Azarova et al., 2002)

So now – bearing in mind the actual APA guidelines – if you're absolutely still being forced by your supervisor or Graduate Office staff to *always* abbreviate citations with $3 \leq \text{authors} \leq 5$, always use the `\shortcite` command for such citations while using `umalayathesis`.

2.2.2 Alternative APA Bibliography Style File

Note: Not recommended; only use this if you absolutely have no other choice e.g. mandatory requirement by your faculty.

The `apacite` package and bibliography style fully implements the APA6 citation and referencing style, including the author expansion of first citations. If you have been forced

to disable these arrangements, you can either always remember to use `\shortcite`, or you may want to use an alternative bibliography style, `newapa`. It's *not* new at all – it's quite old (only new when it was first created!), doesn't fully implement APA's guidelines (e.g. it doesn't expand authors in citations at all). But it might make things a bit more convenient for you. You can activate this by using the `newapa` document class option:

```
\documentclass[newapa]{umalayathesis}
```

This will also load the `natbib` package, so you should use `\citep{...}` for parenthetical citations (Smith, 1990); and `\citet{...}` for text citations i.e. Smith (1990).

2.2.3 Using Another Bibliography Style

If your faculty allows/requires you to use an entirely different bibliography style, use the `custombib` document class option. You are then responsible for loading any packages (e.g. `natbib`) and setting up the necessary `\bibliographystyle`, etc.

For example, if your faculty requires you to use the `IEEEtran` bibliography style, you can write

```
\documentclass[custombib]{umalayathesis}
\bibliographystyle{IEEEtran}
\bibliographystyleown{IEEEtran} %% Style for List of Publications
```

2.2.3.1 Symbols and Abbreviations

If you're just starting to write your thesis, you may want to maintain a list of symbols and acronyms, and process it using the `makeglossaries` command, so that acronyms are automatically expanded/abbreviated, and listed in the List of Symbols and Abbreviations. See the `umalayathesis-manual.pdf` for further information. Great. Let's talk about lexical items (LIs) and parts of speech (POS) in Natural Language Processing (NLP). I

mention again LIs. Oh I have a symbol too, it's temperature degree (θ). And I talk a lot about lexicons.

Or if you've actually already nearly finished writing your thesis, it's probably much easier to forget about glossaries and the `myacronyms.tex` file, and just create a List of Symbols and Abbreviations manually yourself with a `tabular`:

```
\chapter{List of Symbols and Abbreviations}
\begin{tabular}{l @{} : {} l}
UM & University Malaya\\
KL & Kuala Lumpur\\
\end{tabular}
```

(a) *A Fifth Level Heading*

This will not be included in the Table of Contents.

Here's an example `longtable`. Beware: very large long tables can take a loooooong time to compile!

Table 2.3: A sample `longtable`.

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Continued on next page

Table 2.3, continued

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
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One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Continued on next page

Table 2.3, continued

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
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One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Continued on next page

Table 2.3, continued

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Here's a supertabular example too.

Table 2.4: A sample supertabular.

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
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One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Continued on next page

Table 2.4, continued

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
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One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

Continued on next page

Table 2.4, continued

First column	Second column	Third column
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
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One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778
One	abcdef ghijklmn	123.456778

CHAPTER 3: DUMMY CHAPTER

Hello!!

Test 3

Figure 3.1: Let's see. What have we got here?

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**APPENDIX A: MANUALS, TECHNICAL SPECIFICATIONS,
DOCUMENTATIONS, EXAMPLE SCENARIOS**

APPENDIX B: TRY

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