



**USER GUIDE FOR UNIVERSITI PUTRA MALAYSIA
POSTGRADUATE STUDENTS' THESIS TEMPLATE**

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PREFACE

This user guide is for a thesis template developed using \LaTeX in both English and *Bahasa Melayu* versions specifically created to cater to academic requirements as required by the School of Graduate Studies (SGS) for postgraduate students of UNIVERSITI PUTRA MALAYSIA (UPM). The thesis template serves as an alternative to using *Microsoft Word* in the writing of an academic dissertation.

\LaTeX (Lamport, 1994) is a typesetting system which is very suitable for producing scientific and mathematical documents of high typographical quality for publication. It was first introduced as \TeX (Knuth, D.E., 1984) in 1977 but was upgraded to the now known \LaTeX in 1994. \LaTeX is available for most computer systems, from the PC and Mac to large UNIX and VMS systems. It is available free-of-charge making it very accessible for all students.

\LaTeX is quickly becoming one of the most popular typesetting software used in the writing of academic thesis among the postgraduate students of UPM. However, one of the main problems when using \LaTeX is the lack of a thesis template that is standardized within the University itself that is approved by the SGS of UPM. In addition, there is a need for a customized template in softcopy to facilitate the writing of a postgraduate thesis that is specifically tailored to the requirements of academic thesis writing in UPM. The academic requirements was based on the “*Guide to the Thesis Preparation*”, April 2009 edition (School of Graduate Studies, 2009). This step was taken to ensure that the template produced would be a standard template that was in accordance to the requirements and could be used by any postgraduate student of UPM who wished to use \LaTeX to write their thesis.

The Authors
Institute For Mathematical Research
Universiti Putra Malaysia
July 2010

TABLE OF CONTENTS

	Page
PREFACE	i
LIST OF FIGURES	iii
PREREQUISITES	v
THE TERMS	vi
CHAPTER	
1 CONTROLLING PAGE OF THE TEMPLATE	1
1.1 The Template Packages	1
1.2 Start The Writing	3
1.3 Preliminary Pages	4
2 BIBLIOGRAPHY DIVISION	30
2.1 The Parts of The Bibliography	30
2.2 How to The File “bibli.bib”	31
2.3 Viewing The Bibliography in the Thesis	32
3 THE APPENDICES DIVISION AND THE CLOSURE OF THE THESIS	34
3.1 The Appendices Division	34
3.2 The Closure of the Thesis	35
3.2.1 The Biodata Division	35
3.2.2 The List of Publications Division	36
REFERENCES	37

LIST OF FIGURES

Figure	Page
1.1 Header of the UPM Thesis Template	1
1.2 Packages of UPM template	2
1.3 The File of the Title Page (English edition)	4
1.4 The File of the Title Page (<i>Bahasa Melayu</i> edition)	5
1.5 The .pdf Format of the Title Page (English edition)	6
1.6 The .pdf Format of the Title Page (<i>Bahasa Melayu</i> edition)	7
1.7 The File of the Dedication Page (English edition)	8
1.8 The File of the Abstract Page	9
1.9 The .pdf Format of the Abstract Page	10
1.10 The File of the <i>Abstrak</i> Page	11
1.11 The .pdf Format of the <i>Abstrak</i> Page	12
1.12 The File of the Acknowledgement Page (English edition)	13
1.13 The First Approval Sheet (English edition)	14
1.14 The Second Approval Sheet (English edition)	15
1.15 The .pdf Format of the First Approval Sheet (English edition)	16
1.16 The .pdf Format of the Second Approval Sheet (English edition)	17
1.17 The First Approval Sheet (<i>Bahasa Melayu</i> edition)	18
1.18 The Second Approval Sheet (<i>Bahasa Melayu</i> edition)	19
1.19 The .pdf Format of the First Approval Sheet (<i>Bahasa Melayu</i> edition)	20

1.20	The .pdf Format of the Second Approval Sheet (<i>Bahasa Melayu</i> edition)	21
1.21	The File of the Declaration Page (English edition)	22
1.22	The .pdf Format of the Declaration Page (English edition)	23
1.23	The File of the <i>Perakuan</i> Page (<i>Bahasa Melayu</i> edition)	24
1.24	The .pdf Format of the <i>Perakuan</i> Page (<i>Bahasa Melayu</i> edition)	25
1.25	The File of the List of Abbreviations Page (English edition)	26
1.26	The .pdf Format of the List of Abbreviations Page (English edition)	27
1.27	The Figure Environment with Output	28
1.28	The Table Environment with Output	28
1.29	The Divisions of the Chapters (English edition)	29
1.30	The Divisions of the Chapters (<i>Bahasa Melayu</i> edition)	29
2.1	Bibliography Division (English edition)	30
2.2	“ <i>Rujukan</i> ” Division (<i>Bahasa Melayu</i> edition)	30
2.3	Book Environment	31
2.4	Example for Book	32
2.5	Citation of the References in the Thesis	32
2.6	The Cited References	33
2.7	Sample of the Bibliography	33
3.1	The Appendices Division (English edition)	34
3.2	The <i>Lampiran</i> Division (<i>Bahasa Melayu</i> edition)	34
3.3	The File of the Biodata Page (English edition)	35
3.4	The File of the List of Publication Page (English edition)	36

PREREQUISITES

The UPM Thesis Template uses \LaTeX as the typesetting system. \LaTeX includes features designed for the production of technical and scientific documentation. It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing (Mittelbach et al., 2004). At a minimum, you'll need the following programmes to use and access the UPM Thesis Template:

1. \LaTeX binaries and style sheets:

- On Windows: MiKTeX.
- On Unix/Linux: TeX-live.
- On Mac OS X: TeX-live.

2. \LaTeX editor:

- On Windows: TeXnicCenter or WinEdt.
- On Unix: Emacsen, gvim, or Texmaker.
- On Mac OS X: TexShop.

3. \LaTeX viewer/converter: DVI, Ghostscript, Ghostview and Adobe Reader.

A distribution of \LaTeX , with many packages, add-ins, editors and viewers for Windows, Unix, Linux, and Mac can be obtained from the \TeX users group at <http://www.tug.org/texlive/> (\TeX Live - \TeX Users Group, Retrieved 10/01/2010).

THE TERMS

The UPM Thesis Template is divided into three zones.

1. **Programming Zone:** contains two files:
 - a. If you are writing your thesis in English, access the file named “*UPMthesisEnglish*”. The *Bahasa Melayu* version of this file which is called “*UPMthesisMalay*” is used if you are writing your thesis in *Bahasa Melayu*. Both of thesis files end with the extension “.cls”. These files are responsible for the programming of the entire template.
 - b. The file named “*apj*” with the extension “.bst” is responsible for the programming of the bibliography organization.

It is strongly recommended for these files to not be **opened** or **modified** by the user. Any modification on these files would most probably cause errors in the template.

2. **Writing Zone:** contains the files with the extension “.tex”, such as, title page, acknowledgments, chapters, and etc.

The file named “UPMthesisEnglish.tex”, is called the **Controlling Page**. Through this file, the user can go to the divisions of the thesis. The name of the file is a choice of the user; it can be changed. In Chapter 1, all the terms that are illustrated in this file will be explained in detail.

3. **Viewing Zone:** through this zone, the student is able to view what has been written in the writing zone. This zone is controlled by the file with extension “.dvi”. This file can be easily converted to “.pdf” file format.

CHAPTER 1

CONTROLLING PAGE OF THE TEMPLATE

The main page in the template is the controlling page which will contain the following commands, packages, and notes. Bear in mind that any letters/words that follow after the ‘%’ is neglected by the compiler, and is considered a note/comment. On this page the user reads:

```
§-----§  
§   Universiti Putra Malaysia Postgraduate Students Thesis Template (English Version)   §  
§                                     by                                             §  
§   Lai-Soon LEE, Ph.D. and Rand ALFARIS, Ph.D.                                   §  
§   lee@math.upm.edu.my , randalfaris@gmail.com                                    §  
§   Institute For Mathematical Research (INSPEM)                                    §  
§   Universiti Putra Malaysia                                                       §  
§   43400 UPM Serdang, Selangor Darul Ehsan, MALAYSIA.                             §  
§-----§
```

Figure 1.1: Header of the UPM Thesis Template

Followed by the acknowledgments then followed by the “**class of the document**” and the name of the document:

```
\documentclass[doublelespace,tocchapterhead]{UPMthesisEnglish}
```

The only part that the user can change in the class of the document is the name of the file between the curly brackets “{ }”.

1.1 The Template Packages

For the UPM Thesis Template, we are using the following “**packages**”. The user can always add more packages depending on what the user needs to write the thesis. In this template, we have included the following packages:

```

\usepackage{paralist}
\usepackage{natbib}
\usepackage[figuresright]{rotating}
\usepackage{lscap}
\usepackage{graphicx}
\usepackage{longtable}
\usepackage{calc}
\usepackage{slashbox}
\usepackage{amsmath}
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{setspace}
\usepackage{color}
\citestyle{apj}

```

Figure 1.2: Packages of UPM template

The following contains the description for each package that used in the template:

<code>\usepackage{paralist}</code>	Used for bulleting and numbering
<code>\usepackage [figuresright] {rotating}</code>	Allows the rotation of the figures
<code>\usepackage{lscap}</code>	Creates a landscape environment in which \LaTeX rotates the text 90°
<code>\usepackage{graphicx}</code>	Allows the inclusion of graphics
<code>\usepackage{longtable}</code>	Allows the creation of long tables
<code>\usepackage{calc}</code>	Provides an infix arithmetic notation
<code>\usepackage{slashbox}</code>	Allows both column and row headings in a tabular cell
<code>\usepackage{amsmath}</code>	Allows the inclusion of the mathematics equations
<code>\usepackage{amsmath}</code>	Allows the usage of mathematics fonts
<code>\usepackage{amssymb}</code>	Allows the usage of AMS symbols
<code>\usepackage{setspace}</code>	Allows the changing of spaces in the document

<code>\usepackage{color}</code>	Allows colour for the document
<code>\usepackage{natbib}</code>	Related to the bibliography: allows punctuation definitions to be directly coupled to the <code>\bibliographystyle</code> command
<code>\citestyle{apj}</code>	The style of the bibliography

1.2 Start The Writing

The body of the thesis can be found within the commands:

```

\begin{document}
...
\end{document}
```

Any text written after `\end{document}` will be neglected by the compiler, it will be consider as “notes” or “comments”.

Note: The programming commands in L^AT_EX begin with the symbol “\”. Wherever the user reads a command on the controlling page, it should not be **modified** or **deleted**.

The template starts with setting the type of numbering for the preface pages. School of Graduate Studies (SGS) of UPM recommends using the Roman numbers for the preface pages in the thesis. Therefore, user will find in the controlling page the following command:

```

\pagenumbering{roman}
```

1.3 Preliminary Pages

In the UPM Thesis Template, there are a specific number of pages that are required before the start of the “Chapter 1”. These pages are:

1. **TITLE** page:

In the controlling page the user reads the command:

<code>\include{Title}</code> (English edition)
<code>\include{Tajuk}</code> (<i>Bahasa Melayu</i> edition)

Double click on the word “`include`”, a new file named “Title.tex” (Tajuk.tex) will be opened in a new L^AT_EX editor window. These files contain the following:

```
\begin{titlepage}
\begin{center}

\includegraphics[angle=0,width=5in]{logo_UPM.eps}

{\large \bf {\textsc{TITLE OF THESIS} }}

\vspace{50mm}

\bf {\textbf{By}}\}
\vspace{10mm}
{\large \bf{\textbf{NAME OF STUDENT}} } \vspace{75mm}

\begin{singlespace}
{\bf Thesis Submitted to the School of Graduate Studies,
Universiti Putra Malaysia, in Fulfilment of the Requirements for
the Degree of (insert the name of the degree)}
\end{singlespace}

{\bf Month and year of Viva Voce}
\end{center}
\end{titlepage}
```

Figure 1.3: The File of the Title Page (English edition)

```

\begin{titlepage}
\begin{center}

\includegraphics[angle=0,width=5in]{logo_UPM.eps}

{\large \bf {\textsc(TAJUK TESIS) }}

\vspace{50mm}

\bf {\textbf{Oleh}}\}
\vspace{10mm}
{\large \bf{\textbf{NAMA CALON}}}\} \vspace{75mm}

\begin{singlespace}
{\bf Tesis Dikemukakan Kepada Sekolah Pengajian Siswazah,
Universiti Putra Malaysia, Sebagai Memenuhi Keperluan Untuk
Ijazah\} (nama ijazah)}
\end{singlespace}

{\bf Bulan dan Tahun \emph{Viva Voce}}
\end{center}
\end{titlepage}

```

Figure 1.4: The File of the Title Page (*Bahasa Melayu* edition)

The user should not change anything in this file except when it is required. That is, all the user needs to do is to insert the thesis title instead of the phrase “TITLE OF THESIS” (TAJUK TESIS), insert the name instead of “NAME OF STUDENT” (NAMA CALON), insert the name of the degree instead of “insert the name of the degree” (nama ijazah) and insert the month and the year of the Viva Voce instead of “Month and year of Viva Voce” (Bulan dan Tahun *Viva Voce*). The following two figures (Figure 1.5 and Figure 1.6) show the .pdf format of the Title page.



TITLE OF THESIS

By

NAME OF STUDENT

Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of (insert
the name of the degree)

Month and year of Viva Voce

Figure 1.5: The .pdf Format of the Title Page (English edition)



TAJUK TESIS

Oleh

NAMA CALON

Tesis Dikemukakan Kepada Sekolah Pengajian Siswazah, Universiti
Putra Malaysia, Sebagai Memenuhi Keperluan Untuk Ijazah
(nama ijazah)

Bulan dan Tahun *Viva Voce*

Figure 1.6: The .pdf Format of the Title Page (*Bahasa Melayu* edition)

2. DEDICATIONS page:

In the controlling page the user reads the following command:

<code>\addcontentsline{toc}{chapter}{\textbf{DEDICATIONS}}</code> <code>\include{Dedication}</code>	(English edition)
<code>\addcontentsline{toc}{chapter}{\textbf{DEDIKASI}}</code> <code>\include{Dedikasi}</code>	(<i>Bahasa Melayu</i> edition)

Double click on the word “`include`”, and a new file named “Dedications.tex” (Dedikasi.tex) will be opened in a new L^AT_EX editor window. This file contains the following:

```
\begin{center}
{\normalsize \bf DEDICATIONS}
\end{center}

\thispagestyle{empty}
\vspace{2cm}
\begin{center}

\it{
Mum\\
Dad\\
\ldots\\
}
\end{center}
```

Figure 1.7: The File of the Dedication Page (English edition)

All the user needs to do is to insert the dedications between “`\it{`” and “`}`”.

3. **ABSTRACT** page:

This is an important preliminary page. The Abstract, in the controlling page is denoted by the command:

```
\addcontentsline{toc}{chapter}{\textbf{ABSTRACT}}
\include{Abstract}
```

Again, double click on the word “include”, and a new file will be opened in the L^AT_EX editor window. This file is called “Absrtact.tex”, and the file contains:

```
\begin{singlespace}
\begin{center}
Abstract of thesis presented to the Senate of Universiti Putra
Malaysia in fulfilment of the requirement for the degree of
(insert the name of the degree)

\vspace{12mm}

\textsc{\bf TITLE OF THESIS}

\vspace{7mm}

{\textsc By}

\vspace{7mm}

{\bf NAME OF STUDENT}

\vspace{7mm}

{\bf Month and Year of Viva Voce}

\end{center}

\vspace{10mm}
{\bf Chair: Name of Chairman of Supervisory Committee, Ph.D.}

{\bf Faculty: Name of Faculty}

\end{singlespace}
\vspace{12mm} \doublespace {In this study, \ldots}
```

Figure 1.8: The File of the Abstract Page

As we have explained previously, the user should not change or modify anything in this file except where they need to insert their information. Figure 1.9 shows the .pdf format of the Abstract page.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of (insert the name of the degree)

TITLE OF THESIS

By

NAME OF STUDENT

Month and Year of Viva Voce

Chair: Name of Chairman of Supervisory Committee, Ph.D.

Faculty: Name of Faculty

In this study, ...

ii

Figure 1.9: The .pdf Format of the Abstract Page

4. ABSTRAK page:

This abstract is written in *Bahasa Melayu* and is denoted by the command:

```
\addcontentsline{toc}{chapter}{\textbf{ABSTRAK}}
\include{Abstrak}
```

The same explanation of part 3 is applicable here. This file is called “*Abstrak.tex*”, and the file contains:

```
\begin{singlespace}
\begin{center}
Abstrak tesis yang dikemukakan kepada Senat Universiti Putra
Malaysia sebagai memenuhi keperluan untuk ijazah \ldots (nama
ijazah)

\vspace{12mm}

\textsc {\bf TAJUK TESIS}

\vspace{5mm}

{\textsc Oleh}

\vspace{5mm}

{\bf NAMA CALON}

\vspace{7mm}

{\bf Bulan dan Tahun \emph{Viva Voce}}
\end{center}

\vspace{10mm}

{\bf Pengerusi: Nama Pengerusi Jawatankuasa Penyeliaan, Ph.D. }\\
{\bf Fakulti: Nama Fakulti}

\end{singlespace}
\vspace{12mm}

\doubleSPACE{Penyelidikan ini mengkaji \ldots}
```

Figure 1.10: The File of the *Abstrak* Page

Figure 1.11 shows the .pdf format of the Abstrak page.

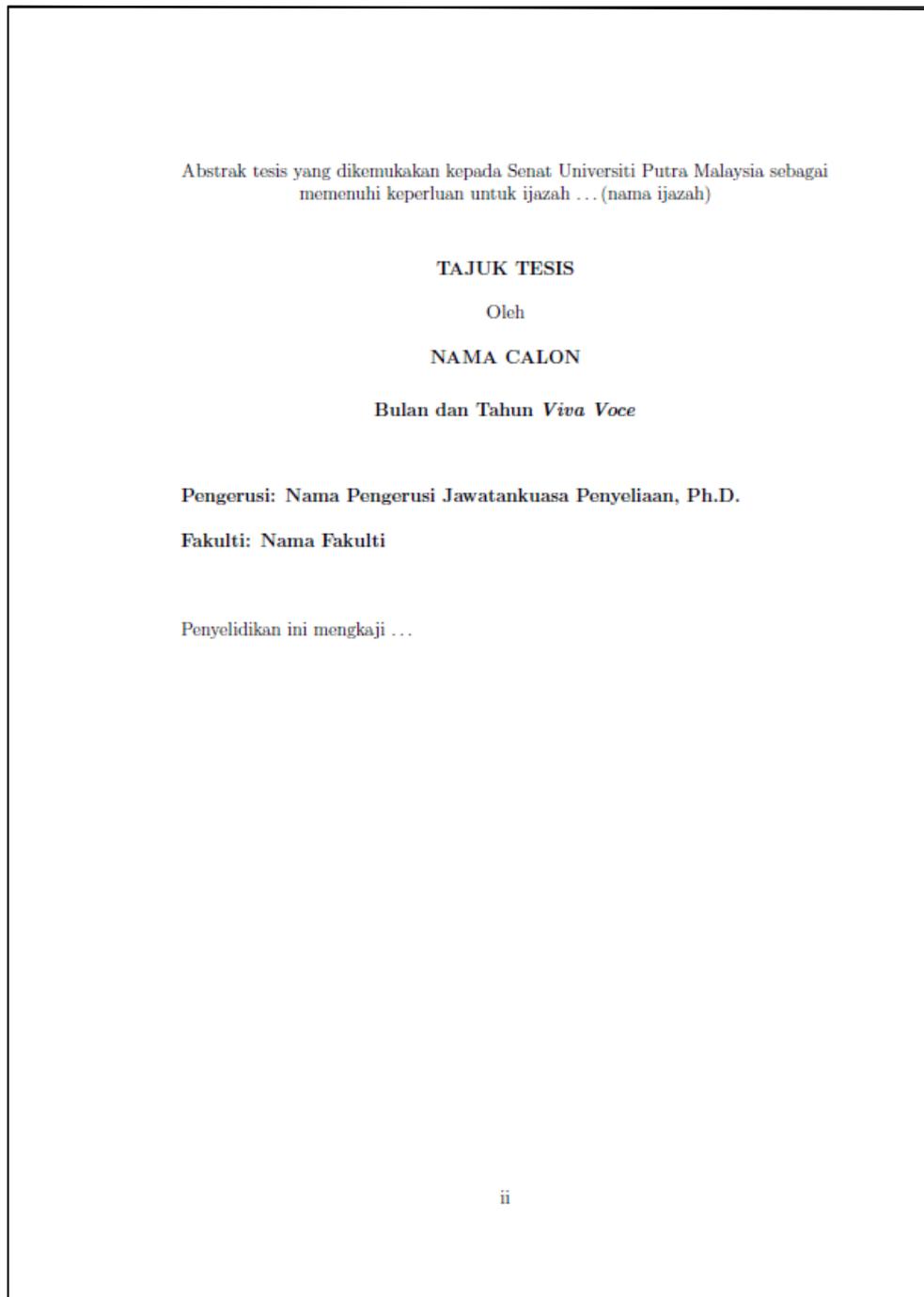


Figure 1.11: The .pdf Format of the *Abstrak* Page

5. ACKNOWLEDGMENTS page:

This is a page for writing the acknowledgments with the command:

<code>\addcontentsline{toc}{chapter}{\textbf{ACKNOWLEDGEMENTS}}</code> <code>\include{Aknow}</code>	(English edition)
<code>\addcontentsline{toc}{chapter}{\textbf{PENGHARGAAN}}</code> <code>\include{Penghargaan}</code>	(<i>Bahasa Melayu</i> edition)

The user should apply the similar procedures as in the dedication file on the file of the acknowledgements. This file contains the following:

```
\begin{center}
{\normalsize \bf ACKNOWLEDGMENTS}
\end{center}

\vspace{1cm}

First of all, I would like to thank \ldots.
```

Figure 1.12: The File of the Acknowledgement Page (English edition)

6. APPROVAL SHEETS pages:

This file contain two pages, the first page is for the Approval Sheet which contains the names of the Examination committee. The second page is the Approval Sheet which contains the names of the Supervisory committee. The Approval Sheets, in the controlling page is denoted by the command:

<code>\addcontentsline{toc}{chapter}{\textbf{APPROVAL}}</code> <code>\include{Approval}</code>	(English edition)
<code>\addcontentsline{toc}{chapter}{\textbf{KELULUSAN}}</code> <code>\include{Kelulusan}</code>	(<i>Bahasa Melayu</i> edition)

After clicking on “include”, the file will be displayed in the new L^AT_EX editor window like the following figures.

```

% ----- Approval Sheet 1: Examination Committee -----%
\begin{singlespace}
I certify that a Thesis Examination Committee has met on
({\bf(insert the date of viva voce)}) to conduct the final
examination of ({\bf(insert the student's name)}) on his (or her)
thesis entitled ``{\bf(Title of thesis)}" in accordance with the
Universities and University Colleges Act 1971 and the Constitution
of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The
Committee recommends that the student be awarded the ({\bf(insert
the name of relevant degree)}).\}
\}
Members of the Thesis Examination Committee were as follows:
\vspace{5mm}

{\bf(Name of Chairperson, Ph.D.)}\}
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\}
Name of Faculty\}
Universiti Putra Malaysia\}
(Chairperson)\}

{\bf(Name of Examiner 1, Ph.D.)}\}
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\}
Name of Faculty\}
Universiti Putra Malaysia\}
(Internal Examiner)\}

{\bf(Name of Examiner 2, Ph.D.)}\}
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\}
Name of Faculty\}
Universiti Putra Malaysia\}
(Internal Examiner)\}

{\bf(Name of External Examiner, Ph.D.)}\}
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\}
Name of Department and/or Faculty\}
Name of Organisation (University/Institute)\}
Country\}
(External Examiner)\}

\begin{table}[b!]
\begin{tabular}{ll}
\hspace{7cm} & \} \\
\cline{2-2} \vspace{-.3cm} & \} \\
& {\bf(BUJANG KIM HUAT, Ph.D.)}\} & \} \\
& \& Professor and Deputy Dean & \} \\
& \& School of Graduate Studies & \} \\
& \& Universiti Putra Malaysia & \} \\
& \& & \} \\
& \& Date: & \} \\
\end{tabular}
\end{table}
\end{singlespace}

```

Figure 1.13: The First Approval Sheet (English edition)

And the second Approval Sheet:

```

% ----- Approval Sheet 2: Supervisory Committee ----- %
\newpage
This thesis was submitted to the Senate of Universiti Putra
Malaysia and has been accepted as fulfilment of the requirement
for the degree of ({type of degree}).\

The members of the Supervisory Committee were as follows:\vspace{5mm}%

({Name of Chairperson, Ph.D. (Omit 'Ph.D.' if not relevant)})\
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\
Name of Faculty\
Universiti Putra Malaysia\
(Chairperson)\

({Name of Member 1, Ph.D. (Omit 'Ph.D.' if not relevant)})\
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\
Name of Faculty\
Universiti Putra Malaysia\
(Member)\

({Name of Member 2, Ph.D. (Omit 'Ph.D.' if not relevant)})\
Title (e.g. Professor/Associate Professor/Ir) -- Omit if not relevant\
Name of the Department and/or Faculty\
Name of Organisation (University/Institute)\
(Member)\
\
(Add or delete if there are more or less than three members in the
supervisory committee, respectively)

\begin{table}[b!]
\begin{tabular}{ll}
\hspace{5.5cm} & \\
\cline(2-2) \vspace{-.3cm} & \\
& (HASANAH MOHD GHAZALI, Ph.D.) & \\
& Professor and Dean & \\
& School of Graduate Studies & \\
& Universiti Putra Malaysia & \\
& & \\
& & \\
& Date: & \\
\end{tabular}
\end{table}
\end{singlespace}
\newpage

```

Figure 1.14: The Second Approval Sheet (English edition)

Figure 1.15 and Figure 1.16 demonstrate the .pdf format of the first and second Approval Sheets.

I certify that a Thesis Examination Committee has met on (**insert the date of viva voce**) to conduct the final examination of (**insert the student's name**) on his (or her) thesis entitled "**Title of thesis**" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the (**insert the name of relevant degree**).

Members of the Thesis Examination Committee were as follows:

Name of Chairperson, Ph.D.
Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant
Name of Faculty
Universiti Putra Malaysia
(Chairperson)

Name of Examiner 1, Ph.D.
Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant
Name of Faculty
Universiti Putra Malaysia
(Internal Examiner)

Name of Examiner 2, Ph.D.
Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant
Name of Faculty
Universiti Putra Malaysia
(Internal Examiner)

Name of External Examiner, Ph.D.
Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant
Name of Department and/or Faculty
Name of Organisation (University/Institute)
Country
(External Examiner)

BUJANG KIM HUAT, Ph.D.
Professor and Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

v

Figure 1.15: The .pdf Format of the First Approval Sheet (English edition)

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of **type of degree**.

The members of the Supervisory Committee were as follows:

Name of Chairperson, Ph.D. (Omit 'Ph.D.' if not relevant)

Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant

Name of Faculty

Universiti Putra Malaysia

(Chairperson)

Name of Member 1, Ph.D. (Omit 'Ph.D.' if not relevant)

Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant

Name of Faculty

Universiti Putra Malaysia

(Member)

Name of Member 2, Ph.D. (Omit 'Ph.D.' if not relevant)

Title (e.g. Professor/Associate Professor/Ir) – Omit if not relevant

Name of the Department and/or Faculty

Name of Organisation (University/Institute)

(Member)

(Add or delete if there are more or less than three members in the supervisory committee, respectively)

HASANAH MOHD GHAZALI, Ph.D.

Professor and Dean

School of Graduate Studies

Universiti Putra Malaysia

Date:

vi

Figure 1.16: The .pdf Format of the Second Approval Sheet (English edition)

The following two figures (Figure 1.17 and Figure 1.18) show the Approval Sheets in *Bahasa Melayu* if the thesis is written in *Bahasa Melayu*.

```

% ----- KELULUSAN 1: Jawatankuasa Pemeriksa -----%
\begin{singlespace}
Saya mengesahkan bahawa satu Jawatankuasa Peperiksaan Tesis telah
berjumpa pada (masukkan {\bf tarikh \emph{viva voce}}) untuk
menjalankan peperiksaan akhir bagi (masukkan {\bf nama pelajar})
bagi menilai tesis beliau yang bertajuk {\bf ``Tajuk tesis''}
mengikut Akta Universiti dan Kolej Universiti 1971 dan
Perlembagaan Universiti Putra Malaysia [P.U.(A) 106] 15 Mac 1998.
Jawatankuasa tersebut telah memperakukan bahawa calon ini layak
dianugerahi ijazah (masukkan {\bf jenis ijazah} berkenaan).
\\

Ahli Jawatankuasa Peperiksaan Tesis adalah seperti berikut:

\vspace{5mm}

{\bf>Nama Pengerusi, Ph.D.)}\\
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\\
Nama Fakulti\\
Universiti Putra Malaysia\\
(Pengerusi)\\

{\bf>Nama Pemeriksa 1, Ph.D.)}\\
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\\
Nama Fakulti\\
Universiti Putra Malaysia\\
(Pemeriksa Dalam)\\

{\bf>Nama Pemeriksa 2, Ph.D.)}\\
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\\
Nama Fakulti\\
Universiti Putra Malaysia\\
(Pemeriksa Dalam)\\

{\bf>Nama Pemeriksa Luar, Ph.D.)}\\
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\\
Nama Jabatan dan/atau Fakulti\\
Nama Organisasi (Universiti/Institusi)\\
Negara\\
(Pemeriksa Luar)\\

\begin{table}[b]
\begin{tabular}{ll}
\hspace{6cm} & \\
\cline{2-2} \vspace{-.3cm} & \\
& {\bf(BUJANG KIM HUAT, Ph.D.)}\\
& Profesor dan Timbalan Dekan & \\
& Sekolah Pengajian Siswazah & \\
& Universiti Putra Malaysia & \\
& & \\
& Tarikh: & \\
\end{tabular}
\end{table}
\newpage

```

Figure 1.17: The First Approval Sheet (*Bahasa Melayu* edition)

```

% ----- KELULUSAN 2: Jawatankuasa Penyeliaan ----- %

Tesis ini telah dikemukakan kepada Senat Universiti Putra Malaysia
dan telah diterima sebagai memenuhi syarat keperluan untuk ijazah
{\bf(jenis ijazah)}. Ahli Jawatankuasa Penyeliaan adalah seperti
berikut:

\vspace{5mm}

{\bf>Nama Pengerusi, Ph.D. (gugurkan `Ph.D.' jika tidak berkaitan)}\}
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\}
Nama Fakulti\}
Universiti Putra Malaysia\}
(Pengerusi)\}

{\bf>Nama Ahli 1, Ph.D. (gugurkan `Ph.D.' jika tidak berkaitan)}\}
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\}
Nama Fakulti\}
Universiti Putra Malaysia\}
(Ahli)\}

{\bf>Nama Ahli 2, Ph.D. (gugurkan `Ph.D.' jika tidak berkaitan)}\}
Pangkat (Profesor/Profesor Madya/Ir) -- jika berkenaan\}
Nama Jabatan dan/atau Fakulti\}
Nama Organisasi (Universiti/Institusi)\}
(Ahli)\}
\}
(Tambah atau gugur nama ahli sekiranya bilangan ahli Jawatankuasa
Penyeliaan melebihi atau kurang daripada tiga orang.)

\begin{table}[b!]
\begin{tabular}{ll}
\hspace{5.5cm} & \}
\cline(2-2) \vspace{-.3cm} & \}
& {\bf HASANAH MOHD GHAZALI, Ph.D.}\}
& Profesor dan Dekan & \}
& Sekolah Pengajian Siswazah & \}
& Universiti Putra Malaysia & \}
& & \}
& Tarikh: & \}
\end{tabular}
\end{table}
\end{singlespace}
\newpage

```

Figure 1.18: The Second Approval Sheet (*Bahasa Melayu* edition)

Figure 1.19 and Figure 1.20 demonstrate the .pdf format of the first and second Approval Sheets in *Bahasa Melayu*.

Saya mengesahkan bahawa satu Jawatankuasa Peperiksaan Tesis telah berjumpa pada (masukkan **tarikh *viva voce***) untuk menjalankan peperiksaan akhir bagi (masukkan **nama pelajar**) bagi menilai tesis beliau yang bertajuk "**Tajuk tesis**" mengikut Akta Universiti dan Kolej Universiti 1971 dan Perlembagaan Universiti Putra Malaysia [P.U.(A) 106] 15 Mac 1998. Jawatankuasa tersebut telah memperakukan bahawa calon ini layak dianugerahi ijazah (masukkan **jenis ijazah berkenaan**).

Ahli Jawatankuasa Peperiksaan Tesis adalah seperti berikut:

Nama Pengerusi, Ph.D.
Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Fakulti
Universiti Putra Malaysia
(Pengerusi)

Nama Pemeriksa 1, Ph.D.
Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Fakulti
Universiti Putra Malaysia
(Pemeriksa Dalam)

Nama Pemeriksa 2, Ph.D.
Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Fakulti
Universiti Putra Malaysia
(Pemeriksa Dalam)

Nama Pemeriksa Luar, Ph.D.
Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Jabatan dan/atau Fakulti
Nama Organisasi (Universiti/Institusi)
Negara
(Pemeriksa Luar)

BUJANG KIM HUAT, Ph.D.
Profesor dan Timbalan Dekan
Sekolah Pengajian Siswazah
Universiti Putra Malaysia

Tarikh:

v

Figure 1.19: The .pdf Format of the First Approval Sheet (*Bahasa Melayu* edition)

Tesis ini telah dikemukakan kepada Senat Universiti Putra Malaysia dan telah diterima sebagai memenuhi syarat keperluan untuk ijazah **jenis ijazah**. Ahli Jawatankuasa Penyeliaan adalah seperti berikut:

Nama Pengerusi, Ph.D. (gugurkan 'Ph.D.' jika tidak berkaitan)

Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Fakulti
Universiti Putra Malaysia
(Pengerusi)

Nama Ahli 1, Ph.D. (gugurkan 'Ph.D.' jika tidak berkaitan)

Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Fakulti
Universiti Putra Malaysia
(Ahli)

Nama Ahli 2, Ph.D. (gugurkan 'Ph.D.' jika tidak berkaitan)

Pangkat (Profesor/Profesor Madya/Ir) – jika berkenaan
Nama Jabatan dan/atau Fakulti
Nama Organisasi (Universiti/Institusi)
(Ahli)

(Tambah atau gugur nama ahli sekiranya bilangan ahli Jawatankuasa Penyeliaan melebihi atau kurang daripada tiga orang.)

HASANAH MOHD GHAZALI, Ph.D.

Profesor dan Dekan
Sekolah Pengajian Siswazah
Universiti Putra Malaysia

Tarikh:

vi

Figure 1.20: The .pdf Format of the Second Approval Sheet (*Bahasa Melayu* edition)

Figure 1.22 shows the .pdf format of the Declaration Page.

DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

(Signature)

NAME OF STUDENT

Date:

vii

Figure 1.22: The .pdf Format of the Declaration Page (English edition)

Figure 1.24 shows the .pdf format of the *Perakuan* Page in *Bahasa Melayu*.

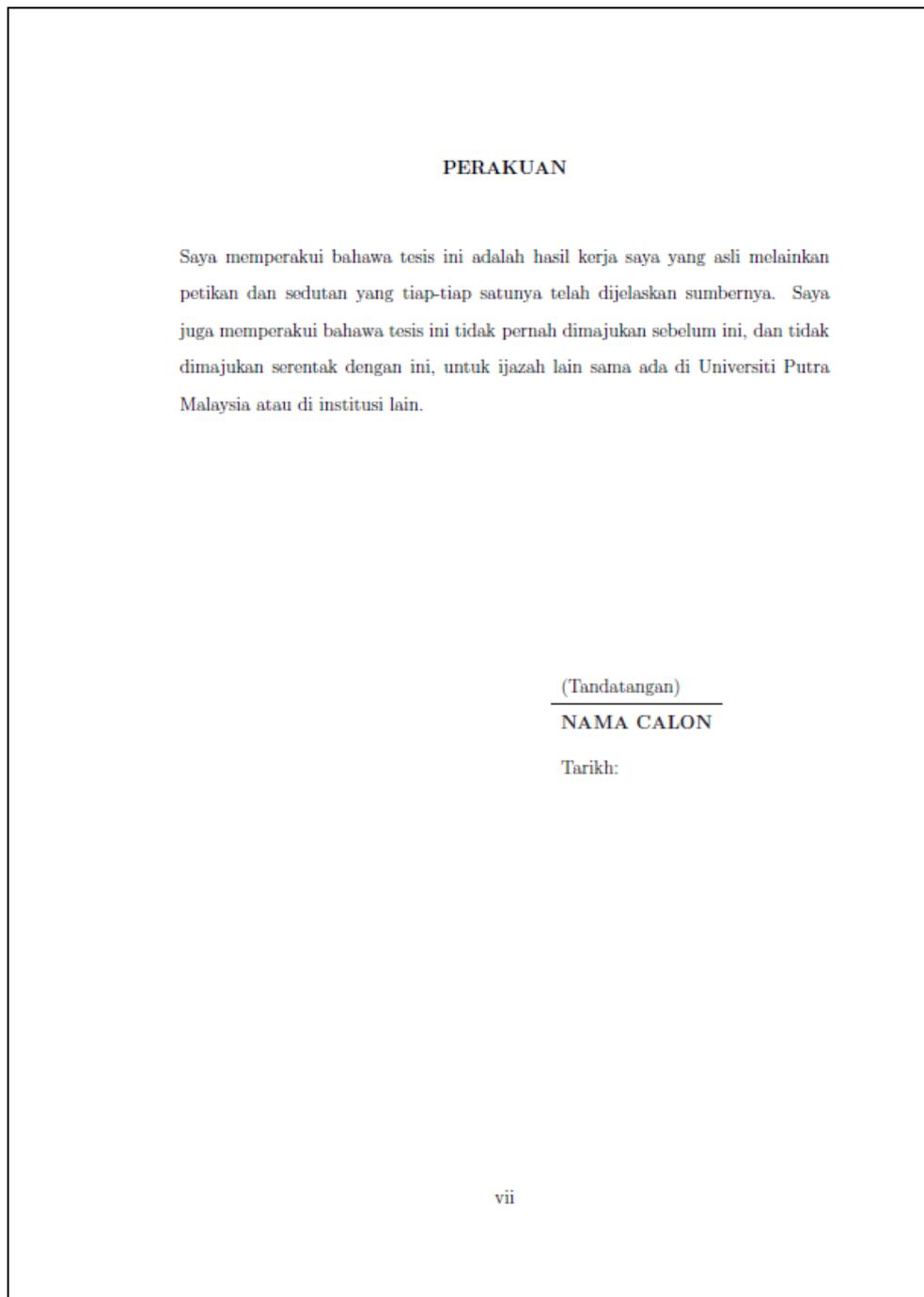


Figure 1.24: The .pdf Format of the *Perakuan* Page (*Bahasa Melayu* edition)

8. CONTENTS, LIST OF TABLES/FIGURES/ABBREVIATIONS pages:

In accordance to the UPM styled thesis, the pages of “Table of Contents”, “List of Tables”, and “List of Figures” are automatically constructed with the following commands typed in the controlling page:

```

\tableofcontents
\listoftables
\listoffigures

```

However, the “List of Abbreviations” page would required the user to manually create a new “.tex” file with the following command:

<pre>\addcontentsline{toc}{chapter}{\textbf{LIST OF ABBREVIATIONS}}</pre>	(English edition)
<pre>\include{abbreviation}</pre>	
<pre>\addcontentsline{toc}{chapter}{\textbf{SENARAI SIMBOL DAN SINGKATAN}}</pre>	(<i>Bahasa Melayu</i> edition)
<pre>\include{Penyingkatan}</pre>	

```

\newpage
\begin{center}
\normalsize{\textbf{LIST OF ABBREVIATIONS}} \vspace{1cm}
\end{center}

*****
% If abbreviations and acronyms (e.g. MARDI, UPM) are used in the
% thesis, they should be explained in a List of Abbreviations, even
% though the full names are given when the terms are first
% mentioned in the text. This list should be the last item in the
% preliminary section. It serves as a ready reference to readers
% not familiar with the abbreviations used in the thesis.
% Universally recognised scientific symbols (such as cm, mm, kg)
% need not be listed.
*****

\begin{center}
\begin{tabular}{ll}
VIM & \hspace{2cm} Variational Iteration Method \\
MVIM & \hspace{2cm} Multistage Variational Iteration Method \\
ODEs & \hspace{2cm} Ordinary Differential Equations \\
PDEs & \hspace{2cm} Partial Differential Equations \\
 $\lambda$  & \hspace{2cm} Lagrange Multiplier \\
ADM & \hspace{2cm} Adomian Decomposition Method \\
SADM & \hspace{2cm} Standard Adomian Decomposition Method \\
MADM & \hspace{2cm} Modified Adomian Decomposition Method \\
RK4 & \hspace{2cm} Fourth-order Runge-Kutta Method \\
HAM & \hspace{2cm} Homotopy Analysis Method
\end{tabular}
\end{center}
\clearpage

```

Figure 1.25: The File of the List of Abbreviations Page (English edition)

Figure 1.26 shows the .pdf format of the List of Abbreviations Page.

LIST OF ABBREVIATIONS	
VIM	Variational Iteration Method
MVIM	Multistage Variational Iteration Method
ODEs	Ordinary Differential Equations
PDEs	Partial Differential Equations
λ	Lagrange Multiplier
ADM	Adomian Decomposition Method
SADM	Standard Adomian Decomposition Method
MADM	Modified Adomian Decomposition Method
RK4	Fourth-order Runge-Kutta Method
HAM	Homotopy Analysis Method

xi

Figure 1.26: The .pdf Format of the List of Abbreviations Page (English edition)

Important Note: The user can insert a figure or table anywhere in the thesis, but the user must follow each table with the following command:

```
\addcontentsline{lot}{\protect\addvspace{.5cm}}
```

and each figure with the following command:

```
\addcontentsline{lof}{\protect\addvspace{.5cm}}
```

These commands must be located after the caption, inside the table or figure environment. The following figures explain the note:

Input:

```
\begin{figure}[h!]
\begin{center}
\includegraphics[angle=0,width=5in]{logo_UPM.eps}
\end{center}
\vspace{-1cm}{\textbf{\caption{UPM Logo}\label{upmLogo}}}
\addtocontents{lof}{\protect\addvspace{.5cm}}
\end{figure}
```

Output:



Figure 1.10: UPM Logo

Figure 1.27: The Figure Environment with Output

Input:

```
\begin{table}[h!]
\begin{center}
{\textbf{\caption{Time Table for Lecture Hall A}\label{timetable}}}%
\addtocontents{lot}{\protect\addvspace{.5cm}}
\begin{footnotesize}
\vspace{0.5cm}
\begin{tabular}{|c|c|c|c|} \hline
& \text{\$}08:00 - 09:00\text{\$} & \text{\$}09:00 - 10:00\text{\$} & \text{\$}10:00 - 11:00\text{\$} \\ \hline
{\bf Monday} & MTH3100(G1) & MTH3101(G2) & MTH3102(G1) \\ \hline
{\bf Tuesday} & \multicolumn{2}{|c|}{MTH3602(G1)} & MTH3200(G6) \\ \hline
{\bf Wednesday} & MTH3500(G3) & \multicolumn{2}{|c|}{MTH3100(G1)} \\ \hline
{\bf Thursday} & \multicolumn{2}{|c|}{MTH3102(G1)} & MTH3102(G2) \\ \hline
{\bf Friday} & \multicolumn{2}{|c|}{MTH3101(G2)} & MTH3602(G1) \\ \hline
\end{tabular}
\end{footnotesize}
\end{center}
\end{table}
```

Output:

Table 2.1: Time Table for Lecture Hall A

	08 : 00 – 09 : 00	09 : 00 – 10 : 00	10 : 00 – 11 : 00
Monday	MTH3100(G1)	MTH3101(G2)	MTH3102(G1)
Tuesday	MTH3602(G1)		MTH3200(G6)
Wednesday	MTH3500(G3)	MTH3100(G1)	
Thursday	MTH3102(G1)		MTH3102(G2)
Friday	MTH3101(G2)		MTH3602(G1)

Figure 1.28: The Table Environment with Output

9. CHAPTER pages:

The user will find the divisions of the chapters in the controlling page as per the following:

```
-----  
\mainmatter  
\doublespace  
%-----  
% The Command:  
% \addtocontents{toc}{\addvspace{.5cm}}  
% must be added before each \include {chapter}  
%-----  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Chapter1} % Chpater 1: Title of the chapter  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Chapter2} % Chapter 2: Title of the chapter  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Chapter3} % Chapter 3: Title of the chapter  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Chapter4} % Chapter 4: Title of the chapter  
%-----Additional chapters may be added -----  
%
```

Figure 1.29: The Divisions of the Chapters (English edition)

```
-----  
\mainmatter  
\doublespace  
%-----  
% 'Command':  
% \addtocontents{toc}{\addvspace{.5cm}}  
% mesti ditambahkan sebelum setiap "\include {Bab}"  
%-----  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Bab1} % Bab 1: Tajuk untuk bab 1  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Bab2} % Bab 2: Tajuk untuk bab 2  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Bab3} % Bab 3: Tajuk untuk bab 3  
\addtocontents{toc}{\addvspace{.5cm}}  
\include{Bab4} % Bab 4: Tajuk untuk bab 4  
%----- Bab tambahan boleh ditambah -----  
%
```

Figure 1.30: The Divisions of the Chapters (*Bahasa Melayu* edition)

CHAPTER 2

BIBLIOGRAPHY DIVISION

2.1 The Parts of The Bibliography

The commands of bibliography division can be found in the controlling page. There are three parts to the Bibliography. The first part is the command:

```
\citestyle{apj}
```

The second part is:

```
-----  
% Bibliography on Chicago Thesis Style with modifications by Rand Alfaris. %  
% Don't make any changes on the following, except for the name of the bibliography file. %  
% For example, we choose here a file named "bibli". %  
-----  
\addcontentsline{toc}{chapter}{\textbf{REFERENCES/Bibliography}}  
\begin{singleSpace}  
\bibliography{bibli}  
\bibliographystyle{apj}  
\end{singleSpace}  
-----
```

Figure 2.1: Bibliography Division (English edition)

```
-----  
% Rujukan menggunakan 'Chicago Thesis Style' dengan pindaan daripada Rand Alfaris. %  
% Dinasihatkan agar tidak membuat sebarang perubahan, kecuali untuk nama bibliografi. %  
% Contohnya, kita memilih di sini nama fail "Rujukan". %  
-----  
\addcontentsline{toc}{chapter}{\textbf{RUJUKAN/BIBLIOGRAFI}}  
\begin{singleSpace}  
\bibliography{Rujukan}  
\bibliographystyle{apj}  
\end{singleSpace}  
-----
```

Figure 2.2: “Rujukan” Division (*Bahasa Melayu* edition)

The third part is the file that will contain the bibliography details. The name of this file in the UPM Thesis Template is called “bibli.bib”. It must be ended with the extension “.bib”, but the name “bibli” can be changed.

2.2 How to The File “bibli.bib”

Entering the details of the bibliography is through the file “bibli.bib”, this file contains the environment of:

1. **ARTICLE**: environment for an article.
2. **BOOK**: environment for a book.
3. **PHDTHESIS**: environment for a thesis, either it is a Ph.D. thesis or Master thesis.
4. **MISC**: environment for website bibliography.
5. **inproceedings**: environment for either a proceeding or chapter in book, it can be used for both.

We will explain in details the “Book” case. The other types of bibliography will follow the same instructions.

The Book:

The environment of the book can be found in the “bibli.bib” such as this:

```
@BOOK{
  author =    {},
  title =    {},
  publisher = {},
  year =     {},
  volume =   {},
  series =   {},
  address =  {},
  edition =  {},
  month =   {}
}
```

Figure 2.3: Book Environment

The user only needs to fill out the details of the book that he/she wants to include in the thesis between the curly brackets “{ }”. For instance:

```
@BOOK{FrankEtAl2004,
  author = {Mittelbach, F. and Goossens, M. and Braams, J. and Carlisle, D. and Rowley, C.},
  title = {{The {\LaTeX} Companion}},
  publisher = {Addison-Wesley},
  year = {2004},
  volume = {},
  series = {},
  address = {US},
  edition = {2nd},
  month = {},
}
```

Figure 2.4: Example for Book

2.3 Viewing The Bibliography in the Thesis

The last section is only for describing how to enter the details of the bibliography. If the user wants to use and view the bibliographies, then he/she must cite them. That means entering the information of the bibliographies is not enough to show them in the thesis. The following steps must be taken:

1. Use the command `\citep{ }` or `\cite{ }` to cite the reference in the desired location in the thesis. For instance:

```
{\LaTeX} \citep{Lamport1994} is a typesetting system which is very
suitable for producing scientific and mathematical documents of
high typographical quality for publication. It was first
introduced as {\TeX} by \cite{Knuth1984} in 1977 but was upgraded
to the now known {\LaTeX} in 1994 \cite{FrankEtAl2004}. {\LaTeX}
is available for most computer systems, from the PC and Mac to
large UNIX and VMS systems. It is available free-of-charge
making it very accessible for all students.\\
```

Figure 2.5: Citation of the References in the Thesis

2. The user needs to compile the L^AT_EX editor **TWICE**.
3. The references will show in the file in two places:
 - i. The first location is the desired location in the thesis.

\LaTeX (Lamport, 1994) is a typesetting system which is very suitable for producing scientific and mathematical documents of high typographical quality for publication. It was first introduced as \TeX by Knuth, D.E. (1984) in 1977 but was upgraded to the now known \LaTeX in 1994 (Mittelbach et al., 2004). \LaTeX is available for most computer systems, from the PC and Mac to large UNIX and VMS systems. It is available free-of-charge making it very accessible for all students.

Figure 2.6: The Cited References

- ii. The second is in the Bibliography division.

BIBLIOGRAPHY

- Knuth, D.E. 1984. *The \TeX book, Volume A of Computers and Typesetting*. 2nd edn. Reading, Massachusetts: Addison-Wesley.
- Lamport, L. 1994. *\LaTeX : A Document Preparation System*. 2nd edn. Reading, Massachusetts: Addison-Wesley.
- Mittelbach, F., Goossens, M., Braams, J., Carlisle, D. and Rowley, C. 2004. *The \LaTeX Companion*. 2nd edn. US: Addison-Wesley.

Figure 2.7: Sample of the Bibliography

CHAPTER 3

THE APPENDICES DIVISION AND THE CLOSURE OF THE THESIS

3.1 The Appendices Division

The appendices division is seen in the controlling page usually at the end of the document:

```
-----  
\newpage  
\addcontentsline{toc}{chapter}{\textbf{APPENDICES}}  
\appendix  
\include{AppendixA} % Appendix A: Title of the appendix  
\include{AppendixB} % Appendix B: Title of the appendix  
-----Additional Appendices may be added-----
```

Figure 3.1: The Appendices Division (English edition)

```
-----  
\newpage  
\addcontentsline{toc}{chapter}{\textbf{LAMPIRAN}}  
\appendix  
\include{LampiranA} % Lampiran A: Tajuk untuk lampiran  
\include{LampiranB} % Lampiran B: Tajuk untuk lampiran  
----- Lampiran tambahan boleh ditambah -----
```

Figure 3.2: The *Lampiran* Division (*Bahasa Melayu* edition)

The appendices is a little different from the other divisions of the thesis. In the files of the appendices, we use the same commands for chapters and sections but with some modification. The file of the appendix starts with the commands:

```
\refstepcounter{chapter}  
\chapter*{APPENDIX \thechapter}  
\label{appendixA}  
\begin{center}  
\textbf{Title of Appendix A}  
\end{center}
```

Notice that, we are using two new commands.

1. The first one is `\refstepcounter{chapter}`.
2. The second one is `\chapter*{APPENDIX \thechapter}`.

These commands must not be modified by the user except for the title of the chapter inside the curly brackets in the command “`\textbf{Title of Appendix A}`”, and of course the “`\label{appendixA}`”.

The same applies when using the command for the sections. Each section must be written:

```
\refstepcounter{section}
\section*{\thesection \quad (Section Title)}
```

Again, these commands must not be modified except for the title of the section which starts after the command “`\quad`”. Whenever the user needs to start a new section or a new chapter in the appendices, the same commands as above must be used.

3.2 The Closure of the Thesis

The last two divisions in the thesis are:

3.2.1 The Biodata Division

The Biodata division is compulsory by the regulation of SGS in UPM. We include this file in the controlling page, after the appendices. The user needs to fill out his/her biodata information before submission of the thesis. Double click on “`include`” command to open the file in a new L^AT_EX editor window:

```
\begin{center}
\normalsize{\textbf{BIODATA OF THE STUDENT}}
\end{center}

The author was born in Sibul, Sarawak on \ldots
```

Figure 3.3: The File of the Biodata Page (English edition)

The user only needs to furnish the biodata information. He/she does not need to change anything in the file.

3.2.2 The List of Publications Division

As we have explained in the previous subsection, the same instructions will be applied on the file of list of publications.

```
\begin{center}
\normalsize{\textbf{LIST OF PUBLICATIONS}}
\end{center}

(Publications that arise from the study)- if applicable. For
example \ldots

\begin{enumerate}
\item H. Nazif and {\bf(L.S. Lee)}. 2010. Optimised Crossover Genetic Algorithm for
Vehicle Routing Problem with Time Windows. \emph{American Journal of
Applied Sciences}. 7(1): 95 -- 101.
\item H. Nazif and {\bf(L.S. Lee)}. 2010. Solving Single Machine Scheduling Problem
with Maximum Lateness using a Genetic Algorithm. \emph{Journal of Mathematics
Research}. (Accepted for publication)
\item {\bf(L.S. Lee)} and H. Nazif. 2009. A Genetic Algorithm for Vehicle Routing Problem.
In \emph{Proceedings of the 4th International Conferences on Research
and Education in Mathematics}, 21 -- 23 October 2009, Kuala Lumpur,
MALAYSIA, pp: 625 -- 631.
\end{enumerate}
```

Figure 3.4: The File of the List of Publication Page (English edition)

One does not need to change anything in the file. The user needs to list the publications that have been published from the research.

BIBLIOGRAPHY

- Knuth, D.E. 1984. *The T_EXbook, Volume A of Computers and Typesetting*. 2nd edn. Reading, Massachusetts: Addison-Wesley.
- Lamport, L. 1994. *L^AT_EX: A Document Preparation System*. 2nd edn. Reading, Massachusetts: Addison-Wesley.
- Mittelbach, F., Goossens, M., Braams, J., Carlisle, D. and Rowley, C. 2004. *The L^AT_EX Companion*. 2nd edn. US: Addison-Wesley.
- School of Graduate Studies. 2009. *Guide to Thesis Preparation*. April 2009 edn. Universiti Putra Malaysia.
- T_EX Live - T_EX Users Group. Retrieved 10/01/2010, Website, <http://www.tug.org/texlive/>.