

HOW TO TYPESET A THESIS: A TEMPLATE AND BRIEF GUIDE TO THE
BISHOP'S UNIVERSITY THESIS DOCUMENT CLASS

by

STEFAN D. BRUDA

A thesis submitted to the
Department of Computer Science
in conformity with the requirements for
the degree of Master of Science

Bishop's University
Canada
April 2024

Copyright © Stefan D. Bruda, 2024
released under a [CC BY-SA 4.0 License](https://creativecommons.org/licenses/by-sa/4.0/)

Abstract

This document is first and foremost a template for a Master's thesis in the Department of Computer Science at Bishop's University using the `buthesis` document class. Since I had to fill it in with something I took the opportunity to provide a quick guide to using the mentioned document class.

In an actual thesis the abstract will be here. Key words should not be included.

Acknowledgments

The `buthesis` document class was inspired by the circa 2002 version of the Queen's University thesis style by Bob Burke, which is in turn based as far as I know on the Stanford University PhD thesis style.

Contents

1 Introduction	1
1.1 The Organization of a Real Thesis	1
2 Typesetting Details	3
2.1 Title Page	3
2.2 Front Matter	4
2.3 Main Matter	4
2.4 References	5
2.5 Appendices	5
Bibliography	6
A A Quick Example	7
B Typesetting Other Kind of Reports	9

Chapter 1

Introduction

The `buthesis` document class defines the style requirements of Master's theses in Computer Science at Bishop's University. The class inherits most of its features from the book standard document class. Additionally we define the front matter, we set the margins and fonts, we set page headers and footers, and we set the style of all the hyperlinks (such as references and citations). We also define proofs and theorem-like environments as per the `amsthm` style with explicit numbering rules.

The use of this document class is compulsory for all the theses in the department. We further recommend (but do not require) the use of `BIBTEX` to manage references with the `siam` bibliography style.

1.1 The Organization of a Real Thesis

In a real thesis this introductory chapter will provide context for your work and will introduce the reader to said work. Beside context, it should include a statement of your research question and explain why the question is worth answering. Finally, an outline of the remainder of the thesis should be provided. This way you basically explain how did you manage to answer your research question.

The most common organization of a thesis continues as follows:

Chapter 2 ("Preliminaries") will present the concepts a reader needs to know in order to understand the rest of your thesis, including but not limited to formal definitions. In organizing this chapter you should assume that the reader has a solid Computer Science background, but is not necessarily a specialist in your field. This chapter is normally longer than the respective section in a journal paper since we require that the thesis is as much as possible self contained.

Chapter 3 ("Previous work") is an important part of your thesis and contains a description of the work performed in the past and related to your work. This chapter is normally *much* longer than the equivalent section in a journal paper, since it is used to show that you have done your homework and you have gathered a comprehensive overview of the whole domain, not just your research question.

Your work is then described in the next chapters. Many people use a single chapter for the purpose, but you should feel free to provide more chapters if you feel that this will result in a better presentation.

The last chapter of the main body of your thesis should conclude the manuscript and possibly outline the future research that is unlocked by your work. Most people call this chapter simply “Conclusions”.

The conclusions should be followed by a list of references, also see Section 2.4.

Sometimes you are faced with the dilemma of having information that is useful for future research and/or for the validation of your results, but that information is too bulky to be included in the main text without hindering comprehension. Examples include but are not limited to long proofs, code, or details about a data set. The proper place for this information is in one or more appendices that come after the bibliography, also see Section 2.5

Chapter 2

Typesetting Details

Most of the time you will typeset your document just as you would when using the standard book document class. This chapter outlines the additional things that need to be done in order to produce a thesis.

The `buthesis` document class has very few useful options. In fact the sole such an option is the font size. Font sizes of 10-, 11-, and 12-point are all acceptable. The recommended size (and also the default) is 11-point. Provide the document class option `10pt` or `12pt` to use a 10-point or 12-point font size, respectively.

You can use as many \LaTeX packages you like as long as they do not modify the fonts, the paper size, or the margins.

2.1 Title Page

The title page of the thesis is set up using a few commands that are outlined below. The title and the author need to be specified as usual using the `\title` and `\author` commands. The following commands further control what goes into the title page and to some degree the front matter. All are optional and have sensible default values if omitted.

- `\dept{author's department}`, defaults to "Computer Science"
- `\degree{degree expected}`, defaults to "Master of Science"
- `\submitdate{month and year when final version is submitted}`, defaults to the full name of the current month followed by the current year
- `\copyrightyear{year degree conferred}`, defaults to the current year
- `\figurespagetrue` or `\figurespagefalse` enable or disable a List of Figures page (enabled by default)

- `\tablespagetrue` or `\tablespagefalse` enable or disable a List of Tables page (enabled by default)

It is recommended to disable the list of figures and/or the list of tables whenever such a list will contain fewer than six entries, though this is a matter of taste more than anything and so it is ultimately up to you.

2.2 Front Matter

Once all the needed information has been provided as described above you need to use the command `\beforepreface` to actually start the document. This command will produce the title page and will set things up to typeset the front matter sections.

Each such a front matter section is introduced by the following command:

```
\prefacesection{section title}
```

Preface sections include the abstract and acknowledgments. These sections are not numbered. The front matter pages are numbered using lower-case Roman numerals.

2.3 Main Matter

The command `\afterpreface` ends the front matter. It produces the tables of contents, tables and figures as applicable, and sets things up to start the main body (on Arabic page 1).

From here on you can typeset the document as you would typeset it using the standard book document class.

Your material is split into chapters. By this point you have undoubtedly noticed that the header of most pages contain the chapter number and title. This is fine most of the time, but becomes a problem for those chapters whose title is too long for the allotted space. The document class will not do anything about long titles, their name will simply overflow to the right, over the page number and possibly further.

It is your responsibility to ensure a good fit into the header. Specifically, if the title of the chapter is too long you need to define a shorter version to appear in the header. This shorter version is called a *running title* and can be provided using the following command right after the respective `\chapter` command:

```
\chapterrunning{a running title for the chapter}
```

This will result in the following page header for the current chapter:

```
CHAPTER x. A RUNNING TITLE FOR THE CHAPTER
```

where x is the current chapter number.

2.4 References

A list of references (called the bibliography) is an integral part of your thesis. We strongly recommend the use of `BIBTEX` for your bibliography. If you decide to go this route you are strongly encouraged to use the SIAM bibliography style. Therefore you will need the following two lines in your document:

```
\bibliographystyle{siam}
\bibliography{mybib}
```

where `mybib.bib` is your `BIBTEX` database.

On the other hand we do recognize that using yet another system (`BIBTEX`) results in an even steeper learning curve. If you want to avoid `BIBTEX` then you can roll your own bibliography using the `thebibliography` environment.

However, if you go the manual route you must observe the requirement that all the references in your bibliography must be cited in the text. `BIBTEX` does that for you automatically, but you are on your own if you decide not to use it.

Additionally, your references should be sorted alphabetically by author and should be numbered. Their citation in the text should be a parenthetical remark containing only the reference number and preferably using square parentheses like this: [1]. Verbose citation styles such as the APA or the Chicago style are strongly discouraged. The SIAM citation style (realized using the `siam` `BIBTEX` style) is our preferred standard.

2.5 Appendices

If needed appendices follow the bibliography. The end of the main matter and beginning of appendices is marked by the use of the command `\appendix`, followed by the appendices themselves which are each introduced by the usual command `\chapter`. Note that the use of `\appendix` will cause these subsequent chapters to be named differently (“Appendix” instead of “Chapter”) and also numbered differently.

Bibliography

- [1] L. LAMPORT, *LaTeX: A Document Preparation System*, 2nd edition, Addison-Wesley Professional, 1994

Appendix A

A Quick Example

For the impatient here is a minimal yet fairly complete template for a thesis that uses the `buthesis` document class. Happy typesetting!

```
\documentclass{buthesis}

\begin{document}
\title{How to Write Theses\\
With Two-Line Titles}
\author{John Henry Candidate}

\beforepreface

\prefacesection{Abstract}
This thesis tells you all you need to know about...

\prefacesection{Acknowledgments}
I would like to thank...

\afterpreface

\chapter{Introduction}
...
\chapter{Conclusions of Why It All Matters and Let's Make This Long}
\chapterrunning{conclusions} % so that we do not overflow the header
...

\begin{thebibliography}{1}
  \bibitem{Lamport1994}
  \textsc{L. Lamport}, \emph{LaTeX: A Document Preparation System},
```

```
    2nd edition, Addison-Wesley Professional, 1994
    ...
\end{thebibliography}

% Or better yet just use BibTeX, like this:
%
% \bibliographystyle{siam}
% \bibliography{mybib}

\appendix
\chapter{A Long Proof}
...
\end{document}
```

Appendix B

Typesetting Other Kind of Reports

The other kind of reports that you will have to produce while you move along throughout your degree include the thesis proposal and the progress report. These must be typeset using a different document class namely, `bureport`. This class is a very thin layer on top of the `article` standard document class.

The only things that you need to do differently from a regular article is to define a few parameter using the following three commands, all of them with sensible defaults.

- `\dept{author's department}`, defaults to “Computer Science”
- `\degree{degree expected}`, defaults to “Master of Science”
- `\report{report type}`, defaults to “thesis proposal”

These commands must come before `\maketitle`.

Note that reports are articles and so the main sectioning unit is the section (`\section`) rather than the chapter. Also note that references should be provided according to the same standard as in a thesis (see Section 2.4).

Here is a quick template:

```
\documentclass{bureport}

\begin{document}
\title{How to Write Reports}
\author{John Henry Candidate}
\report{miscellaneous report}

\maketitle

\section{Introduction}
...
```

```
\section{Literature Review}
...
\section{Conclusions}
...
\bibliographystyle{siam}
\bibliography{mybib}
\end{document}
```