CSD LaTeX Estimacin de la mirada

Thesis submitted in accordance with the requirements of
the University of Liverpool for the degree of Doctor in Philosophy
by
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December 2005

Resumen

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Acknowledgement

The author wishes to thank the University of Liverpool Computing Services Department for the development of this LaTeX thesis template.

Nomenclature

Glossary A list of often difficult or specialized words with their definitions usually placed in technical literature.

Neophyte A beginner or novice.

Tome A book, especially a large or scholarly one.

WYSIWIG An acronymn for *'What you see is what you get'* often applied to word processors although many in the TeX community believe that *'What you see is all you've got'* is closer to the truth.

Chapter 1

How to use the Thesis Template

1.1 Introduction

LaTeX is a document publishing system which can produce high quality output particulary when complicated formulae need to be reproduced in print. Because of this it is widely used by mathematicians. LaTeX is essentially a collection of TeX macros which is a typesetting language in its own right. TeX is quite difficult to learn but provides much finer control over typsetting then LaTeX. Most users will find that LaTeX meets most of their needs and will therefore have little need of TeX. LaTeX is available on both the MWS and Sun UNIX services with the MWS version having the added advantage of including a graphical user interface called TeXShell.

There are no courses provided by CSD in LaTeX however, information is available on line. The TeXShell/MikTeX guide can be found at:

http://www.liv.ac.uk/CSD/acuk_html/414.dir/414.doc

and there is also an FAQ at:

http://www.liv.ac.uk/csd/software/ps/faqtex.htm

The Sun UNIX LaTeX guide is at:

http://www.liv.ac.uk/CSD/acuk_html/452.dir/452.pdf

If you are new to LaTeX, then probably the best place to start is with Leslie Lamport's very readable guide, *"LaTeX - A Document Preparation System"* [3] . If you need to delve into TeX, then *"The TeXbook"* [2] by Donald E. Knuth is essential reading. Knuth, a leading light in computer science, designed the TeX language in order to produce his seminal work *"The Art of Computer Programming"* [1] so this really is the definitive guide to the subject.

To save users from having to type in a many low level TEX commands, style files can be used to define additional macros which can be used in addition to standard ones from LATEX. Many journal publishers provide style files to ensure that all submissions conform to a standard 'house' format. It may be worth checking on the Internet to see if style files are available to suit your particular discipline.

1.2 Running LATEX

This section descrines how to take the thesis template file (**thesis.tex**) and convert it into a PostScript or Portable Document Format (PDF) file which can be printed on a high quality laser printer. Both PostScript and PDF files can be previewed prior to printing using either Ghostview or Adobe's Acorobat viewer. There are some common pitfalls and misconceptions associated with with Ghostview and PostScript, and neophyte users are strongly advised to take a look at the "FAQ for Ghostview and PostScript" at:

http://www.liv.ac.uk/csd/software/latex/faqtex.htm

Both LATEX and TEX convert the original "source" file into a DVI file (by convention having the **.dvi** extension) before this is converted to PostScript. DVI is short for DeVice Independent format, meaning that it works independently of the printer format (usually PostScript) which is used to produced the hard copy version. Despite what the name suggests, DVI files are seldom useful outside of the LATEX environment.

Historically speaking, PostScript has been widely used to publish LATEX derived articles on the World Wide Web but, since the arrival of PDF, this should be stricly discouraged. PostScript is a format designed for use with laser printers and many modern web browsers have difficulty displaying files which contain it. On the other hand most browsers will display PDF files and PDF is becoming an increasing popular standard for sharing textual information [1].

1.2.1 LATEX on the Sun UNIX Service

To "compile" the template file (**thesis.tex**) into a DIV file, the following command is used:

```
$ latex thesis.tex
```

---

[1]You might wish to consider how best to save your thesis in electronic format for posterity. Saving the LATEX original as a plain text file and the formatted version as a PDF file onto ordinary CD-R is probably the safest bet at the moment, although bear in mind that the computer graveyard is full of "standards" of depressingly short longevity. Fortunately, LATEX is likely to be far more future proof than this week's version of Microsoft Word.

Alternatively, in the unlikely circumstances that the input file contains pure TEX , use:

```
$ tex pure_tex_file.tex
```

Assuming that this does not throw up any errors, you can then convert the DVI file to PostScript format using:

```
$ dvips thesis
```

You can then preview the output to ensure that what you get from the printer is actually what you wanted using Ghostview as follows:

```
$ ghostview thesis.ps &
```

Finally, to print the output to a laser printer, use:

```
$ lpr -Pps thesis.ps
```

By default, this will go to the central printer in Brownlow Hill; the **-P** option can be used to direct the output elsewhere. It is straightforward to convert the PostScript version to PDF:

```
$ ps2pdf thesis.ps thesis.pdf
```

and infact it is possible to convert LATEX documents to many other formats, including HTML. See the TeX FAQ for details.

1.2.2 LATEX on the Managed Windows Service

LATEX on the Managed Windows Service comes in two parts namely: a group of programs run from the DOS command line called MikTeX and a graphical windows interface called TeXShell. If neither of these appear to be installed on your MWS PC click

```
Start | Install | Office | MikTeX 2.1
```

The TeXShell interface is by far the easiest to work with although MikTeX provides additional programs not accessible through the standard TeXShell interface [2]. To compile the template file click on

```
File | Open
```

in TeXShell and browse to where you have saved **thesis.tex**. Then click on the LaTeX button (use the TeX button for plain TEX files).

To convert the DVI output to PostScript, click on the Dvips button. You can then preview the output prior to printing by clicking the Ghostview button. The document can then be printed by clicking File | Print inside Ghostview.

---

[2]Although they can be included — see the FAQ for details.

1.3 Some examples of LaTeX text formatting

1.3.1 Plain Text

Type your text in free-format; lines can be as long or as short as you wish. You can indent or space out your input text in any way you like to highlight the structure of your manuscript and make it easier to edit. LaTeX fills lines and adjusts spacing between words to produce an aesthetically pleasing result.

Completely blank lines in the input file break your text into paragraphs. To change the font for a single character, word, or set of words, enclose the word and the font changing command within braces, *like this.* A font changing command not enclosed in braces, like the change to **bold here, keeps that change in effect until the end of the document or until countermanded by another font switch, like this change back to** roman.

1.3.2 Displayed Text

Use the "quote" and "quotation" environments for typesetting quoted material or any other text that should be slightly indented and set off from the normal text.

> The quote and quotation environments are similar, but use different settings for paragraph indentation and spacing.
> *When in doubt, consult the manual.*

1. The "enumerate" environment numbers the list elements, like this.

   Items in a list can contain multiple paragraphs. These paragraphs are appropriately spaced and indented according to their position in the list.

   - The "itemize" environment sets off list items with "bullets", like this. Finally, the "description" environment lets you put your own

     A label on each item, like this "A".

     If the label is long, the first line of the item text will be spaced over to the right as needed.

   - Of course, lists can be nested, each type up to at least four levels. One type of list can be nested within another type.

     – Nested lists of the same type will change style of numbering or "bullets" as needed.

2. Don't forget to close off all list environments with the appropriate \end{...} command. Indenting \begin{...}, \item, and \end{...} commands in the input document according to their nesting level can help clarify the structure.

Here is a very simple table showing data lined up in columns. Notice that the table is in a "center" environment to display it properly. The title is created simply as another paragraph in the center environment, rather than as part of the table itself.

Numbers of Computers Network, By Type.

Macintosh	175
DOS/Windows PC	60
UNIX Workstation or server	110

Here is a more complicated table that has been boxed up, with a multi-column header and paragraph entries set in one of the columns.

Places to Go Backpacking		
Name	Driving Time (hours)	Notes
Big Basin	1.5	Very nice overnight to Berry Creek Falls from either Headquarters or ocean side.
Sunol	1	Technicolor green in the spring. Watch out for the cows.
Henry Coe	1.5	Large wilderness nearby suitable for multi-day treks.

1.3.3 Mathematical Equations

Simple equations, like x^y or $x_n = \sqrt{a+b}$ can be typeset right in the text line by enclosing them in a pair of single dollar sign symbols.

A more complicated equation should be typeset in *displayed math* mode, like this:

$$p(x) = \lim_{N \to \infty, \Delta x \to 0} \sum_{j=1}^{K} (f_j / \Delta x)$$

The "equation" environment displays your equations, and automatically numbers them consecutively within your document, like this:

$$\mu_m = \sum_{i=0}^{m} (-1)^i \binom{m}{i} \mu_1^i \mu'_{m-i} \quad \text{where} \quad \binom{m}{i} = \frac{m!}{i!(m-i)!}. \tag{1.1}$$

Here is the input file that produced these formatting examples:

```
\subsection {Plain Text}
Type your text in free-format; lines can be as long
or as short
as you wish.
        You can indent        or space out
        your input
            text in
                any way you like to highlight the structure
        of your manuscript and make it easier to edit.
LaTeX fills lines and adjusts spacing between words to produce an
aesthetically pleasing result.

Completely blank lines in the input file break your text into
paragraphs.
To change the font for a single character, word, or set of words,
enclose the word and the font changing command within braces,
{\em like this}.
A font changing command not enclosed in braces, like the change to \bf
bold here, keeps that change in effect until the end of the document or
until countermanded by another font switch, like this change back to
\rm roman.

\subsection {Displayed Text}
Use the ``quote'' and  ``quotation'' environments for typesetting quoted
material or any other text that should be slightly indented and set off
from the normal text.
\begin{quotation}
The quote and quotation environments are similar, but use different
settings for paragraph indentation and spacing.

\em When in doubt, consult the manual.
\end{quotation}


\begin{enumerate}
\item
```

The ``enumerate'' environment numbers the list elements, like this.

Items in a list can contain multiple paragraphs.
These paragraphs are appropriately spaced and indented according to their
position in the list.
    \begin{itemize}
    \item The ``itemize'' environment sets off list items with ``bullets'',
like this. Finally, the ``description'' environment lets you put your own
        \begin{description}
        \item[A] label on each item, like this ``A''.
        \item[If the label is long,] the first line of the item text will
be spaced over to the right as needed.
        \end{description}
    \item Of course, lists can be nested, each type up to at least four levels.
One type of list can be nested within another type.
        \begin{itemize}
        \item Nested lists of the same type will change style of numbering
or ``bullets'' as needed.
        \end{itemize}
    \end{itemize}
\item Don't forget to close off all list environments with the
appropriate \verb+\end{...}+ command.
Indenting \verb+\begin{...}+, \verb+\item+, and \verb+\end{...}+
commands in the input document according to their nesting level can help
clarify the structure.
\end{enumerate}

Here is a very simple table showing data lined up in columns.
Notice that the table is in a ``center'' environment to display
it properly.
The title is created simply as another paragraph in the center environment,
rather than as part of the table itself.
\begin{center}
Numbers of Computers Network, By Type.

\begin{tabular}{lr}
Macintosh&175\\
DOS/Windows PC&60\\
UNIX Workstation or server&110\\

```
\end{tabular}
\end{center}
```

Here is a more complicated table that has been boxed up, with a multi-column
header and paragraph entries set in one of the columns.

```
\begin{center}
\begin{tabular}{|l|c|p{3.5in}|}
\hline
\multicolumn{3}{|c|}{Places to Go Backpacking}\\ \hline
Name&Driving Time&Notes\\
&(hours)&\\ \hline
Big Basin&1.5&Very nice overnight to Berry Creek Falls from
either Headquarters or ocean side.\\ \hline
Sunol&1&Technicolor green in the spring.  Watch out for the cows.\\ \hline
Henry Coe&1.5&Large wilderness nearby suitable for multi-day treks.\\ \hline
\end{tabular}
```

```
\subsection {Mathematical Equations}
Simple equations, like $x^y$ or $x_n = \sqrt{a + b}$ can be typeset right
in the text line by enclosing them in a pair of single dollar sign symbols.
```

```
A more complicated equation should be typeset in {\em displayed math\/} mode,
like this:
\[
p(x)=\lim_{N \rightarrow \infty, \Delta x \rightarrow 0}\sum_{j=1}^{K}(f_j/\Delta x)
\]
The ``equation'' environment displays your equations, and automatically
numbers them consecutively within your document, like this:
\begin{equation}
\mu_m=\sum_{i=0}^m(-1)^i{m \choose i}\mu_1^i\mu_{m-i}^{\prime} \; \; {\rm where} \; \;
\end{equation}
```

1.4   Including figures

LaTeX can be used to include figures in documents provided that they are in *Encapsulated* PostScript (EPS) format (ordinary PostScript is not suitable). The process of including figures can be quite fiddly and if you need to include a large number of figures it may be quicker and easier to use a desktop publishing package. Generally line drawings work better than pictures (i.e. raster or bitmapped graphics) as the latter take up

considerable disk space and take long periods of time to print. There are different methods which can be used to include figures. One is to place the `\usepackage{graphics}` command at the beginning of the file and then use the `\includegraphics` command to include the EPS file as has been employed here:

Figure 1.1: The University of Liverpool Grid (ULGrid) Logo

1.5   Keep reference information upto date

In a document as large and as complicated as a thesis the ability to cross-reference information contained both within the thesis itself and in external references quickly and easily is obviously essential. Clearly the author does not want to have to change the reference numbering every time a reference is added or removed. Fortunately LaTeX can ensure that the numbering is automatically kept consistent. References can be cross-references to other information in the thesis in the form of equations, figures, theorems etc or they can be references to entries in the bibliography. LaTeX can also ensure that the tables of contents and figures reflect the current page numbering. It can also produce a glossary and index automatically. All of the topics are described in more detail below.

1.5.1   Cross-references

To create a cross-reference, the `\label` command is used to provide the information with a key which LaTeX can then use to generate a cross-reference number for using the `\ref` command. For example, this should contain the equation number for the second equation displayed above (1.1). The `\label` command was used earlier to provide a key for the equation and the `\ref` command used here to generate the corresponding equation number. You can extend this idea to figures (e.g. the ULGrid logo: Figure 1.1) or hypotheses, theorems, lemmas, corollaries . . . infact just about anything you may want to cross-reference. Note that when you first run **latex/dvips** on the document in which a reference has been created, the reference number may not appear correctly. This is because LaTeX cannot possibly know the number of a reference occuring later in the document to where it is was cited. To do this, it must scan through the original TeX file twice and, indeed, the way to ensure that cross-references are upto date and

consistent is just to run **latex** twice before running **dvips** [3].

1.5.2 Creating a table of contents

A table of contents can be generated in LaTeX simply by including the command `\tableofcontents`. As with all references, it may be necessary to run **latex** twice in order to generate the numbering correctly. This has been used in this thesis template.

1.5.3 Creating a table of figures

A table of figures can similarly be generated in LaTeX by simply including the command `\listoffigures`. As with all references, it may be necessary to run **latex** twice in order to produce the correct numbering. This has been used in this thesis template.

1.5.4 Creating a glossary

A glossary can be created in a similar manner to an index. The `\makeglossary` is placed in the preamble to document and `\nomenclature` used instead of `\index` to add glossary entries. The `\printglossary` command is to indicate where the glossary is to appear. Creating the index files for a glossary is slightly more complicated. For this template file the following command is used:

```
$ makeindex -s nomencl -o thesis.gls thesis.glo
```

The term "glossary" has been included as an example.

1.5.5 Creating an index

Although indices are difficuly to produce and are fairly rare in theses, LaTeX can take out much of the tedious work needed in creating one. To create an index you will need to include the commands `\usepackage{makeindex}` and `\makeindex` at the start of the document. The command `\printindex` is used to indicate where you want the index to appear (usually right at the end of the document). To index a particular term place the command `\index` as close as possible to it in the text. You can find a number of references to this section in the index at the end of this template. Creating the index requires a little additional work when running LaTeX. After running the **latex** command to compile the document, then run

```
$ makeindex thesis
```

and run **latex** again twice in order to include the index in the output (**.dvi**) file. Further details can be found in Lamport's book [3].

---

[3]Those from a computing background may see that this is analagous to how a two–pass compiler resolves forward references.

1.5.6 Bibliography and citation

A citation is a cross-reference to another publication, such as a journal article called the *source*. With LaTeX , the citation is produced by a `\cite` command having the citation key as its argument. LaTeXuses a separate program called BIBTeX to produce the source list for the program. You can find details of how to do this in Lamport's book [3]. Sources are placed in a separate bibliographic database file (**.bib** file). The bibliography can be formatted using a variety of predefined styles or you may be able to find a style sheet that more accurately reflects the format used in your particular disciple. With BIBTeX it is first necessary to run **latex** on the main document, then **bibtex** on the **.bib** file then **latex** twice on the main document again. It may be worth keeping a record of all references you come across in the **.bib** file for future use as it can be used in many different publications (e.g. journal papers).

1.6 Footnotes

Footnotes can be added quite easily by using the `\footnote` command such as in this example [4]. The University rules state that footnotes should be labelled consecutively throughout the document. This is what LaTeX does by default.

1.7 Splitting the input

LaTeX uses sophisticated algorithms to decide when to split lines and how much space to insert between words, essentially mimicking the, now bygone, art of manual type setting (composition). Such attention to detail ensures that the quality of LaTeX output is unsurpassed but it also comes at a cost. Compiling a LaTeX document, particularly one as large as a thesis, takes a considerable time which isn't incurred by WYSIWIG word processors such as Microsoft Word (which consequently produce far inferior quality output). Since only small changes are generally made to the document at a time it makes sense to split the document into smaller parts and compile these individually using the **latex** command only when they need to be. Splitting the input also means that the author can edit much smaller individual files rather than an entire tome each time.

The LaTeXcommand `\include` can be used to gather the sections together in a "root" document and this has been used to split Chapter 2 of this template into a separate file (**chapter2.tex**). For a thesis it, may well be worth working on an individual chapter at a time and then combining them together at the end. The root document will need to be compiled and any indexes created to ensure the correct numbering before printing out the final hard copy version.

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[4]There are several footnotes in this template.

Chapter 2

Thesis Preparation Rules

The following notes have been produced for the guidance of research degree candidates in the presentation of their theses. This information is taken from the Postgraduate Handbook and Graduate School web pages. To download a PDF version of the Handbook, follow the link on the quick links panel of the Graduate School web page at:

http://www.liv.ac.uk/gradschool/thesisprep.htm

or open

http://www.liv.ac.uk/sas/administration/pgrhandbook.pdf

in Internet Explorer. All students, however, should ensure that they also consult their supervisor(s) about the presentation of their theses.

2.1   Sources

Candidates must state generally in the preface and specifically in the body of the thesis the sources from which their information is derived and the extent to which they have availed themselves of the work of others.

2.2   Length

The various Regulations require that a thesis should be as concise as possible. In no circumstances should a thesis of more than 100,000 words be submitted for PhD or MD (60,000 for MPhil), including the footnotes and appendices, unless written permission has been obtained from the candidate's supervisor, the Head of the Department and the Faculty Board concerned. It is recommended that the Head of Department seek the view of potential examiners before granting his/her approval.

2.3   References

References to published work should be given consistently in a format that is currently accepted in the field of work covered by the thesis. If in doubt, candidates should consult their supervisors about the best method.

2.4   Number of copies required

Three copies of the thesis and any supporting papers are normally required. Two copies should be deposited in the office of the Dean of the candidate's Faculty, who will make arrangements for the examination of the thesis. The candidate should retain one copy. However, if three Examiners are appointed, three copies must be deposited in the office of the Dean of the candidate's Faculty. After the examination, the University will retain two copies in permanent bindings. One of these copies will be retained in the University Library. The candidate's supervisor will retain the other copy.

2.5   Restrictions on access to theses

An author may impose restrictions on access to theses and copying annually for up to five years, if the Head of Department endorses the author's statement that such restriction is necessary for good reasons, e.g. preparation for publication or a patent application. This will not prevent the publication of the Abstract. Permanent restriction is not permitted, nor does the University accept theses written under contracts of secrecy (see section 18 above and the Note on Theses in the current edition of the University Calendar).

2.6   Presentation and layout

In the following specification some of the requirements of BS 4821:1990 have been adopted to ensure that doctoral theses conform to the standards expected by the British Library. Copies of the British Standard (now withdrawn from publication) may be consulted in the Sydney Jones and Harold Cohen Libraries. Authors' rights are protected under the University's agreement with the British Library. (vii) Typing, printing and copying Type must be uniform and clear in all copies, for both text and illustrations. The minimum height for capital letters is 2 mm and the minimum x-height (height of lower-case 'x') 1.5 mm. The main body of the text must be in black ink on white paper. A personal computer with a printer of good quality (e.g. laser or inkjet) must be used to produce the first copy. Good, permanent photocopies on plain paper are acceptable for the second and third copies. Copies made by chemical means, which may fade, are not. The copier must be checked before use to ensure that it does not produce extraneous marks on the copies.

2.7 Binding and lettering

Theses may be presented for examination in either permanent or temporary bindings.

Permanent binding The thesis to be bound in book form in a strong cloth of any suitable colour. Maximum thickness 65 mm (2.5"): if of greater thickness, two or more volumes per copy will be required. The binding of all volumes must be identical. The thesis should be bound in such a way that it can be opened fully for ease of microfilming. Final hardbinding is undertaken off university campus by SRJ Ltd in Liverpool (phone: 0151 709 1354). Visit their website: http://www.srjservices.co.uk/. Lettering on permanent bindings to be in gold. Front cover: title of thesis. Spine: Top: degree. Middle: surname and initials. Bottom: year of submission.

Temporary binding The thesis should be presented in such a way that the pages cannot be readily removed. The use of ring binders is therefore not permitted. The candidate's surname, initials, the date (month and year) and the degree to be shown on the outside front cover. Softbinding of initial submission can be undertaken by the university print unit. After the thesis has been approved by the Examiners, two copies must be permanently bound as above and deposited with the Dean of the candidate's Faculty before arrangements for the conferment of the degree can be made.

2.8 Title page

(Centred) Title of thesis Then 'Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy (or other degree as appropriate) by <full forenames and surname>.' Then (centred) Date (month and year) with suitable line spacing.

2.9 Table of contents

The table of contents must show chapter headings and page numbers. All separate sections of the thesis, such as bibliography, lists of abbreviations, supporting papers, etc., must also be identified on the contents page.

2.10 Abstract

Each copy of the thesis must be accompanied by a separate copy of the Abstract indicating the aims of the investigation and the results achieved. For microfilming purposes it must:

- Be typed or printed although good photocopies are acceptable;

- be not longer than can be accomplished by single-spaced type on one side of an A4 sheet (about 450 words);

- show the author and title of the thesis in the form of a heading.

2.11 Paper

A4 white bond paper of 70 to 100 g/m^2 weight must be used for both originals and photocopies, except for any endpapers which carry no text. If both sides of the paper are used for text, then:

- Both sides must be used in both copies which are to be permanently bound;

- there must be little or no 'show-through' - paper lighter than 80 g/m^2 should not be used;

- the full binding margin of 40 mm must be allowed on the left side of odd pages and the right side of even pages - other margins must be 25mm minimum.

Margins and line spacing $1\frac{1}{2}$ spacing is advised, but at least double line spacing should be used for text that contains many subscripts and superscripts. Quotations may be indented. Authors should check the text carefully for 'widows and orphans' and make full use of all error-checking facilities.

2.12 Page numbers

Pages should be numbered consecutively and the position of page numbers (candidate's choice or as advised by the supervisor) should be consistent throughout.

2.13 Footnotes

Footnotes should be inserted at the foot of the relevant page in single line spacing. Smaller type may be used, if available. A line should be ruled between footnotes and the text. Footnotes should be numbered consecutively throughout the thesis.

2.14 Diagrams, maps, illustrations and supporting material

Diagrams, maps and illustrations should be placed as near to the relevant text as possible. If it is necessary to place illustrations in a separate volume, the binding must match that of the text. Photographs must be prints of good quality and adequate size.

Identical and permanent prints of any monochrome or colour photographs used must be securely mounted in each copy of the thesis. Published papers submitted in support of the thesis should be sewn in by the bookbinder as an appendix. Essential material that cannot be sewn in (large charts, tapes, floppy discs, CDs, microfiches, etc.) must be placed securely in a pocket attached to the inside back cover of each copy by the bookbinder. Before submitting material that cannot be read without special facilities, candidates must satisfy themselves and their supervisors (a) that it is essential to include such material and (b) that the Examiners have ready access to such facilities.

2.15   Further advice

The following publications, which can be consulted in the University Libraries, give advice on the preparation of theses and methods of bibliographical reference. Students are advised to purchase their own copies of their chosen manual.

2.15.1   For Humanities and Social Sciences

MHRA Style Book, Modern Humanities Research Association, London. MLA Style Sheet, Modern Language Association of America, Baltimore.

Watson, G: *Writing a thesis: A guide to long essays and dissertations.* Longman, 1987. Turabian, K L: A manual for writers of term papers, theses and dissertations. University of Chicago Press, Chicago, 1987.

2.15.2   For Sciences, Engineering and Medicine

Barrass, R: *Scientists must write: A guide to better writing for scientists, engineers and students.* Science Paperbacks, Chapman & Hall, 1978.

Booth, V: Communicating in science: *Writing and speaking.* Cambridge University Press.

Lindsay, D: *Guide to scientific writing — a manual for students and research workers.* Longman, London, 1990.

Lock, S: *Thorne's better medical writing.* Pitman, London, 1977. O'Connor, M and Woodford, F P: *Writing scientific papers in English: An Else-Ciba Foundation guide for authors.* Elsevier, Amsterdam, 1976.

2.15.3 For all candidates

Stanisstreet, M: *Writing your thesis: Suggestions for planning and writing theses and dissertations in science-based disciplines.* University of Liverpool Research Sub-Committee, 1988.

Stanisstreet, M: *Preparing for your viva: Suggestions for preparing for postgraduate vivas in science-based disciplines.* University of Liverpool Research Sub-Committee, 1988.

These booklets were written by a scientist with scientists principally in mind, but much of the advice therein will benefit those in other disciplines. Copies are normally issued automatically to research students in science- based departments. They may also be obtained on request, free of charge, from Faculty Offices and the Student & Examinations Division, Senate House.

Appendix A

Example Appendix

Appendices are usually labelled with letters separate to ordinary chapters.

Bibliography

[1] Donald E. Knuth. *The Art of Computer Programming (3 vols.).* Addison-Wesley, 1977.

[2] Donald E. Knuth. *The T$_E$Xbook.* Addison-Wesley, 1984.

[3] Leslie Lamport. *L^{A}T$_E$X: A Document Preparation System.* Addison-Wesley, 1986.

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