

The Prescribed Form for the Presentation of Theses

This document is intended to provide guidance for the presentation of theses at Cranfield University. **The only mandatory requirements are those given in the Prescribed Form below, and these must be observed by all students.** If your thesis does not comply with these requirements, you will be informed by the Library of the amendments which need to be made, and you will need to resubmit.

The majority of this guide consists of suggestions for the layout of your thesis. As long as you have complied with the mandatory requirements, the general layout is largely a matter of personal taste.

Please note that staff candidates submitting a body of published work as their final dissertation must still comply with the regulations. Published articles, papers presented at conferences etc, should be retyped in the appropriate point size, and with the correct margins as specified in the prescribed form.

1. Each student must present copies of the thesis as directed by the Academic Registrar. This will include an electronic version and may in addition include hard copies.

The form(s) of binding for the submitted theses are determined by each Campus and Campus requirements must be observed. The University retains the right to charge students for the cost of binding.

Students may be required to submit further revised copies of their thesis (in addition to the paper versions) as directed by the Library or the examiner.

2. Any hard copy submission of a thesis must be prepared on A4 size white paper of a minimum weight of 80g/m² (usual printer or photocopy paper) and be identical to the electronic PDF version, in accordance with the following specification:
 - a. The text must be typed, including titles and captions of illustrations, with margins of **not less than 3cm on all four sides**.
 - b. Pages of text, including inserted illustrations and appendices, must be numbered consecutively.
 - c. Photographs, drawings, graphs and other illustrations which are not incorporated in the text should be digitally inserted into the document.
 - d. The size of print for the main body of text should be not less than 12 point and in a clear and legible font. Students are encouraged to print on both sides of the page.

3a. The cover (or title page if the thesis is hard bound) must contain, in this order:

- the name of the University, ie Cranfield University
- the name of the author
- the title of the work
- the author's School
- the course title
- the award for which the thesis is submitted, (eg MSc, PhD)
- the academic year of original submission
- the name of the supervisor
- the date of presentation

At the foot of the page the following copyright notice shall be included. In accordance with the provisions of Regulation 35 this notice shall indicate that copyright is assigned to Cranfield University, except in any case where a contrary arrangement has been specifically agreed in writing. The notice shall normally therefore read:

© Cranfield University, date (year only). All rights reserved. No part of this publication may be reproduced without the written permission of the copyright holder.

An additional statement shall also be included at the foot of the title page immediately above the copyright notice as follows, except where the award of the Degree sought is based solely on examination of the thesis:

"This thesis is submitted in partial fulfilment of the requirements for the Degree of ..."

4. The page immediately following the title page must contain an abstract of not more than 300 words.
5. A list of references and/or bibliography must be included in the thesis. Sufficient information must be given to allow references to be easily traced. The style of referencing must be consistent and in line with any school policy.

Points 1-5 listed above constitute the Prescribed Form for the presentation of theses at Cranfield University, and are mandatory for all theses.

Submitting your thesis

Please refer to the Registry for details concerning the number of copies of theses to submit and the format of these copies (binding, electronic copies etc)

Amendments

Should you need to make any amendments to the content of your thesis, you will receive a letter from the Assistant Registrar. Your supervisor will outline the precise changes to be made. Amendments to the physical presentation of the thesis will be communicated in a letter from the Library. For amendments to any paper copies of theses, you can choose to substitute individual pages, or else replace the entire thesis.

Restricted status

If your thesis contains commercially or nationally sensitive information, it may be desirable to restrict its availability. It is the responsibility of the supervisor and the head of department to request restricted status, but you should draw your supervisor's attention to any potentially confidential content as early as possible. Forms for the restriction of a thesis are available from Student Records.

Illustrations and photographs

Photographs, drawings, graphs and other illustrations which are not incorporated in the text should be digitally inserted into the document. Drawings which are larger than A4 may be included as long as they are folded down to A4 size.

Copyright

Copyright for all Cranfield theses belongs to Cranfield University.

Physical arrangement of theses

This is not definitive, but a reasonable layout would be as follows:

- Front cover
- Title page
- Abstract
- Acknowledgements, if applicable
- List of contents
- List of figures
- Notation
- Main body of text
- References and/or Bibliography
- Appendices
- Tables, unless these are included in the text
- Illustrations, unless these are included in the text
- Back cover

Cover page

The format of the cover and title pages is mandatory, as laid out in the Prescribed Form. An example of the cover page is given as Appendix A.

Title page

An example of the title page is given as Appendix B. If your thesis is submitted in two parts, you will need to submit two title pages, indicating the volume number beneath the title on each. It is not customary to include military ranks, degrees or professional qualifications. If the copies are to be bound in two parts, separate title pages should be provided for each volume and the volume number included beneath the title.

List of contents

It is good practice to use the same style for the list of contents as you have used in the main text. It is usual to use upper case for main headings and upper and lower case for subheadings. If you have included more than five illustrations, it is helpful to include a list of figures. Both the contents page and the list of figures should be on un-numbered pages, and if both are very short, they can appear together on the same page. Page numbers should be those on which each section starts, ie '29' rather than '29-32'.

Notation

Any symbols used in the report should be listed under the heading 'Notation' and should appear before the main text, again on an un-numbered page. Any acronyms should be fully explained, either in footnotes or in a separate key.

Main text

The size of print for the main body of text should be no smaller than 12 point, although headlines may be larger. It is up to you whether you use single or double line spacing.

Page numbering should begin with the introduction on page 1 and should include inserted illustrations. Page numbers should be consecutive and should appear at the centre of each sheet, approximately 1.5cm from the top or bottom. Page numbers fall outside the mandatory 3cm margin.

Appendices

Appendices are expansions or more detailed explanations which it would not be appropriate to incorporate into the main text. They should be lettered A, B, C, and paginated consecutively with the main text.

Illustrations

Please bear in mind the following points when preparing graphs and illustrations.

Where a series of graphs is being produced, the positioning of scales and keys should be as consistent as possible, so it is a good idea to wait until the series is complete before deciding on the position of keys etc.

Plus or minus signs and decimal points should not be written exactly on the grid lines as they are not clearly visible. Decimal points should be preceded by a zero in the case of decimal proper fractions and should be typed onto a clear space on the grid.

Axes should not be extended to far beyond the extent of the graph and should be broken when it is necessary to indicate a false zero.

Lines should be drawn between experimental points rather than through them, but curves should be smooth and continuous. Curves should not be extended beyond the extreme experimental points without good reason.

In graphs where several parameters are plotted against a common parameter along the abscissa, (X-axis) this scale need not be repeated unless confusion would arise by not doing so. One ordinate (y-axis) scale can often be used for several parameters by using factors for each parameter.

Where a family of curves or a carpet is plotted, labelling should be consistent for each curve.

On graphs that are to be reduced in size, any symbols used on the originals should be larger than normal so that they reduce clearly. If you are comparing up to three cases, it is preferable to use solid, dashed, and chain dotted lines rather than different symbols. Alternatively, the use of different symbols without lines is recommended.

If the values in the abscissa (x-axis) appear outside the grid, the decimal point should appear below the line and whole numbers should be placed symmetrically about the line to which they refer.

Any values appearing outside the grid on the bound side should be written so that about 1cm is left free for legibility.

It is recommended that the title, which includes the figure number, should begin in line with the bottom left-hand corner of the grid as it is meant to be read. The title should generally take up no more than two lines, but if you do need to include additional title information, it should normally be laid out in the same direction as the title.

If you wish to have all the lines on the graph paper showing on the photocopy, avoid blue graph paper, as this does not copy well. Conversely, use blue graph paper if you wish to eliminate the grid.

Computer printout

If you wish to include a computer printout, the line length should be either 70 characters, to fit upright on A4, or 100 characters, to fit sideways, remembering to allow 3cms on all sides.

Computer programs

It is not generally necessary to include computer programs with the thesis unless it constitutes the major part of the thesis or is necessary for the understanding of the thesis.

Photographs

Photographs should be digitally inserted into the document. Should you require photographic services, it is advisable to submit your requests as early as possible to avoid delays.

Mathematical Notation

Computer language mathematical notation should not be used if there is any danger that it could be ambiguous.

Doctoral students

Cranfield University is an Open Access Sponsor of the Electronic Theses Online Service (EThOS) at the British Library. PhD and EngD theses are made freely available via the EThOS service. See <http://ethos.bl.uk> for further details.

References

The terms 'references' and 'bibliography' are often used interchangeably, but in fact each serves a different purpose within a document. References refer solely to the works cited within the document, while the terms 'bibliography' or 'further reading' are taken to mean everything which has contributed to your knowledge of the subject, even if you have not made direct reference to it. Anything which is not your own work or common knowledge should be referenced, and direct quotations, graphs, figures, etc, should include page numbers in the text reference.

There are two main recognised standards for the citation of bibliographic references; Harvard and Turabian, which are very similar, but differ in the placing of the date and place of publication. Cranfield University is not prescriptive about the precise style which should be used in theses, but it is important to use the same style throughout, and to include sufficient information to enable your examiner to evaluate your sources, and your reader to identify and obtain them.

The important part of any bibliographic style is the information provided in the reference, and the order in which it appears. Other aspects, such as whether titles are italic or underlined, or whether authors' first names appear in full or as initials, are a matter of individual choice. However, it is important to be consistent, so however you choose to interpret your chosen style, make sure that that it is the same throughout.

Please note that it is always the book title, conference title, or journal title which appears in italics, not titles of chapters, individual papers, or articles.

Citing a book

Harvard

Johnson, Gerry and Scholes, Kevan. (1997). *Exploring corporate strategy: text and cases*, 4th ed. Prentice Hall, London.

Turabian

Johnson, Gerry and Scholes, Kevan. *Exploring corporate strategy: text and cases*, 4th ed. London: Prentice Hall, 1997.

Citing a chapter in a book

Harvard

Strati, Antonio. (1990). Aesthetics and organizational skill. In: *Organizational symbolism*, edited by Barry A. Turner. Walter de Gruyter, Berlin, p. 45-63.

Turabian

Strati, Antonio. Aesthetics and organizational skill. In: *Organizational symbolism*, edited by Barry A. Turner. Berlin: Walter de Gruyter, 1990, p. 45-63.

Citing a journal article

Harvard

Seo, H. J. (1998). The effect of injection hole length on film cooling with bulk flow pulsations. *International journal of heat and mass transfer*, 41(2), p. 35-39.

Turabian

Seo, H. J. The effect of injection hole length on film cooling with bulk flow pulsations. *International journal of heat and mass transfer*, 41(2), 1988, p. 35-39.

Abbreviated journal titles are commonly seen in published articles, but ambiguous abbreviations are extremely unhelpful to the reader, and can make it very difficult to obtain the item. It is usually better to cite the journal title in full. Some journals do not have a volume and part format, but may simply give month and year, or a concurrent number, in which case it should be cited as it appears. Journal articles in foreign languages should be included in the list of references, but a translation in brackets is helpful.

Citing a conference paper

Harvard

Cao, X., Gabbert, U. and Peotzsch, R. (1998). Delamination modeling and analysis of adaptive composites. In: *39th AIAA/ASME/ASCE/AHS/ASC structures, structural dynamics, and materials conference and exhibit*, Long Beach, California, April 20-23 1998, Vol. 4, AIAA, Reston, VA, p. 2911-2916.

Turabian

Cao, X., Gabbert, U. and Peotzsch, R. Delamination modeling and analysis of adaptive composites. In: *39th AIAA/ASME/ASCE/AHS/ASC structures, structural dynamics, and materials conference and exhibit*, Long Beach, California, April 20-23 1998, Vol. 4, Reston, VA: AIAA, 1998, p. 2911-2916.

Citing a reference which has been cited in another source

If you are using a quotation which has been cited by another author in a published work, it is important to cite the work in which you actually read it, rather than the work in which it originally appeared, unless you have also read the original work.

Harvard

Patton, M. Q. (1980). *Qualitative evaluation methods*. Sage, Beverley Hills, CA. Cited in: Greenfield, Tony (ed). (1996). *Research methods: guidance for postgraduates*, Arnold, London, p. 169.

Turabian

Patton, M. Q. *Qualitative evaluation methods*. Beverley Hills, CA: Sage, 1980. Cited in: Greenfield, Tony (ed). *Research methods: guidance for postgraduates*, London: Arnold, 1996, p. 169.

Citing ephemeral sources

In-house reports and company literature are often useful sources of information, and should be included in the bibliography if they have been referred to directly. However, they are not conventionally published, and would be impossible for anyone else to obtain through the usual interlibrary loan process. It is therefore helpful to indicate this in brackets.

Harvard

Society of British Aerospace Companies. (1998). *The competitiveness challenge*. SBAC, London (unpublished report).

Turabian

Society of British Aerospace Companies. *The competitiveness challenge*. London: SBAC, 1998 (unpublished report).

Citing Internet resources

Unlike conventionally published sources, there are no recognised standards for citing electronic sources. In purely stylistic terms, the placing of the date within the reference should be consistent with your chosen style for the sake of appearance, but the guiding principle should be to include such information as is necessary for the reader to locate the document.

It is worth bearing in mind that although information is increasingly being made available and accessed via the Internet, it is by definition ephemeral, and may not be available for the reader to locate. It may therefore be useful to include a copy of the document as an appendix.

Royal Melbourne Institute of Technology Libraries (1997). *Citing Internet resources* (WWW document). <http://www.lib.rmit.edu.au/citing/htm>. (accessed 10th September 1998).

Linking references with the text

Direct quotations and general references to works by published authors must be acknowledged in the body of the text with a link to the full bibliographic reference at the end of the thesis or project.

Name and date method

The easiest way to link text references with the complete bibliographic reference is to refer in the text to the name of the author and the date of the work, eg (Smith, 1990). The list of bibliographic references would therefore appear in alphabetical order.

If the author's name occurs naturally in the sentence, it is enough to add the date, for example:

Johnson (1995) argues that the converse is true.....

Otherwise, name and date can be added in brackets, for example:

This has been documented in a number of recent studies (Smith, 1992; Hargreaves and Johnson, 1994; Melrose, 1989).

Where the same author has published more than one work in the same year, these can be distinguished by a lower case letter in both the full bibliographic reference and the text reference, for example:

Brown (1988a) demonstrated that.....

If a specific page is referred to, it should be cited in the text reference, rather than the bibliographic reference, for example:

This was discussed in detail by Anderson (1980, p.332)

N.B. If you choose to use this method, you do not need to number the bibliographic references in your list, as the author alone is enough to identify each one.

Numbering method (consecutive)

Another method is to refer to the text reference by number, eg Smith¹³. Your bibliographic references will need to be numbered, whichever method you choose (see below), in order to link the reference in the text with the reference at the end of your thesis.

If you choose to number your text references consecutively throughout the thesis, your reference list will not be in alphabetical order. Using consecutive numbers, the first text reference could refer to an author called Zaman, so this would appear first in the list of references, while the last one could refer to someone called Allbright, and would therefore appear last.

Numbering method (alphabetical)

If you prefer to arrange your bibliographic reference list in alphabetical order, the numbers you use throughout the text will not be in consecutive order. If the first text reference in your thesis is to Zaman, and the bibliographic reference for Zaman appears as the twentieth in your list, the text reference will be number twenty, despite the fact that it is the first in the thesis. Similarly, Allbright may appear as reference one in the bibliography, and so will be text reference one, even if it is the last in the thesis.

It is worth bearing in mind that in both numerical systems, the addition of any extra references in the text after the bibliography has been numbered will necessitate re-numbering of both the bibliography and the text references.

Footnotes

There may be occasions when you wish to use footnotes to clarify or elaborate upon references in the body of the text. If you find yourself making repeated references to the same book or article, the name and date style of text reference, combined with page numbers, will be sufficient. However, if you do not want to use the name and date method, you may find it helpful to use footnotes to provide an abbreviated citation. Please note, however, that if you choose to do this, you will need to use the same number to indicate your footnote as you have done to link to your full bibliographic reference.

Traditionally, authors have used the abbreviations *ibid.* and *op.cit.* to indicate works previously cited in footnotes, but these are regarded nowadays as rather archaic, and you should not feel any obligation to use them as few readers will understand them. *Ibid.* means 'in the same place', and can only be used when the footnote immediately preceding it refers to the same work, and has already provided the title, for example:

13. Kline, P. The handbook of psychological testing, p67.
14. *Ibid*, p14-17.

Op. cit. means 'in the work cited', and is used to refer to a work which has already been cited in a previous footnote, but which does not immediately precede it. You will need to repeat the name of the author, to identify the footnote in which it has been cited, for example:

5. Gist, M. et al. Personnel psychology, 44(4), p38.
6. ECMT, Round table 82, p78.
7. Gist, M. *op. cit.*, p40.

N.B. References in footnotes are not complete citations; they are simply enough to link the text reference with the full citation at the end of the thesis or project.

Writing style

A thesis or report is a particular type of document and must satisfy particular requirements. Logical structure, clear definition and development of the argument, precise language, and rigorous referencing are expected of a good thesis. If English is not your first language, it is often useful to ask someone else to read through your thesis to make sure that it actually says what you intend it to say. Below are a few general suggestions which you may find useful.

Do:

- Plan the structure of the thesis. If you have already formed a clear idea of the content of each section, it will be easier to sort your material to fit the structure you have established.
- Be precise, but not simplistic. Do not use a long word where a short one will convey your meaning just as well. Equally, do not use simplistic English where a single longer word will convey greater depth.
- Make sure that all assertions, claims, purported facts etc can be verified, either by your own findings, or by sources that you have cited.
- Make sure that your references are complete, accurate and consistent.
- Ensure that your references are properly linked to the text.
- Acknowledge your sources.
- Provide an explanation for any abbreviations used.

Do not:

- Pad out the text unnecessarily to make it longer.
- Include references which have not been used.
- Submit incomplete or inaccurate references.
- Use direct quotations without acknowledgement.
- Use inappropriate or out-of-date references.

Guidelines for the length of theses

The following are intended to be guidelines for the maximum length of theses, but are not mandatory and guidance should be sought from your supervisor.

SAS:

MSc (taught): 8,000 words plus appendices

NOTE: This is mandatory for taught master students in the School of Applied Sciences.

PhD: 40,000 words plus appendices

SOE:

MSc/MPhil: 20,000 words plus appendices, and a maximum of 150 pages including appendices

PhD: 40,000 words plus appendices, and a maximum of 300 pages including appendices

SoM:

MSc: 15,000-20,000

MPhil: 30,000-60,000 words plus appendices

PhD: 55,000-80,000 words plus appendices

Cranfield Health:

MSc: 20,000 words plus appendices

PhD: 40,000-60,000 words OR 20,000 + three published papers, plus appendices

Further guidelines for students in the School of Applied Sciences

While this document describes good practice, taught masters students in the School of Applied Sciences should also refer to the Faculty approved guidelines published in the School's own *Prescribed format for submission of MSc (taught) theses*.

This document is available to all SAS students in the thesis area of their Blackboard.

Further reading

Bailey, Edward P Jr. *Writing clearly: a contemporary approach*. Columbus, Ohio: Charles E Merrill, 1984.

Berry, Ralph. *How to write a research paper*. 2nd ed. Oxford: Pergamon, 1986.

The Chicago manual of style. 13th ed. Chicago: University of Chicago Press, 1982.

Cooper, Harris. *Synthesizing research: a guide for literature reviews*. 3rd ed. Thousand Oaks: Sage, 1998.

Fink, Arlene. *Conducting research literature reviews: from paper to the Internet*. Thousand Oaks: Sage, 1998.

Hart, Chris. *Doing a literature review: releasing the social science research imagination*. London: Sage, 1998.

Li, Xia, and Crane, Nancy B. *Electronic style: a guide to citing electronic information*. Westport, CT: Meckler Publishing, 1993.

Markel, Mike. *Writing in the technical fields: a step-by-step guide for engineers, scientists, and technicians*. Piscataway, NJ: IEEE Press, 1994.

Palmer, Richard. *Write in style: a guide to good English*. London: E & FN Spon, 1993.

Richardson, Laurel. *Writing strategies: reaching diverse audiences*. Qualitative research methods series 21. Newbury Park, California: Sage, 1990.

Sharp, John A. and Howard, Keith. *The management of a student research project*. 2nd ed. Aldershot: Gower, 1996.

Taylor, Gordon. *The student's writing guide for the arts and social sciences*. Cambridge: Cambridge University Press, 1989.

Turabian, Kate L. *Manual for writers of term papers, theses and dissertations*. 5th ed. Chicago: University of Chicago Press, 1987.

Turk, Christopher and Kirkman, John. *Effective writing: improving scientific, technical and business communication*. London: E & FN Spon, 1982.

This leaflet is available in other formats on request

Cover page

CRANFIELD UNIVERSITY

J BOND

THE MANUFACTURE AND USE OF PRECISION TOOLS

SCHOOL OF ENGINEERING
[Course title]

MSc THESIS
Academic year: 2004-05

Supervisor: R. Goldfinger
September 2005

Title page

CRANFIELD UNIVERSITY

SCHOOL OF ENGINEERING
[course title]

MSc THESIS

Academic Year 2004-2005

J BOND

The manufacture and use of precision tools

Supervisor: R Goldfinger

September 2005

This thesis is submitted in partial fulfilment of the requirements
for the degree of Master of Science