

MANUAL FOR THESES AND DISSERTATIONS FORMATTED
WITH UA-THESIS.CLS WITH THE DRAFT OPTION

by
The Graduate College

A Dissertation Submitted to the Faculty of the
GRADUATE INTERDISCIPLINARY PROGRAM
IN APPLIED MATHEMATICS

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

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ABSTRACT

This example dissertation contains the original text of the “Manual for Theses and Dissertations”, written by the Graduate College at the University of Arizona. It has been obtained via the internet at

<http://grad.admin.arizona.edu/degrecert/ThesisManual/manual.htm>
on May 10, 1996. The page was last updated November 9, 1995. No guarantee is made that this information is current, and students should check with the Graduate College before submitting a dissertation or thesis.

ACKNOWLEDGMENTS

The contents of this example dissertation has been entirely written by the Graduate College at the University of Arizona.

Chapter 1

INTRODUCTION

Use this manual as a guide for setting up the physical format of your thesis, dissertation or document. Your thesis will represent you, your department, and The University of Arizona in the international scholarly community. Your work is important and worthy of professional presentation. This manual lists Graduate College requirements for the mechanical aspects of meeting these high standards.

In this manual the word thesis, includes documents and dissertations. If format requirements for the document or dissertation vary from those for the thesis, specific requirements for each type of paper will be listed.

Two final copies of the thesis must be submitted; both must meet all specifications of this manual. The two final copies should be submitted unbound in a box to the Graduate College Degree Certification Office.

Chapter 2

UNIVERSITY MICROFILMS INCORPORATED (UMI)

Your thesis will be published by University Microfilms Incorporated, Ann Arbor, Michigan. Upon certification by your major professor, your examining committee, and the Graduate College, a copy of the thesis and a Special Abstract are forwarded to UMI. The manuscript is cataloged and microfilmed, the microfilm negative is inspected and put in vault storage. Paper copies of your work will be produced on demand by UMI. Catalog information is sent to the Library of Congress for production and distribution of catalog cards for libraries. The original copy of the thesis is returned to The University of Arizona Library. The Special Abstract is printed in Microfilm Abstracts and distributed to leading libraries in the United States and abroad and to a selected list of journals and abstracting services.

Publication by UMI does not preclude publication by other means later. You are urged to submit your work for publication in a scholarly or professional journal. Suitable acknowledgment must indicate that the publication is a thesis, dissertation, or document, or portion thereof, which was submitted in partial fulfillment of the requirements for a degree at the University of Arizona.

You must complete a UMI publication agreement, available through the Degree Certification Office.

Chapter 3

SAMPLE MATHEMATICS AND TEXT

3.1 In-line and Displayed Mathematics

The expression $\sum_{i=1}^{\infty} a_i$ is in-line mathematics, while the numbered equation

$$\sum_{i=1}^{\infty} a_i \tag{3.1}$$

is displayed and automatically numbered as equation 3.1.

Let H be a Hilbert space, C be a closed bounded convex subset of H , T a nonexpansive self map of C . Suppose that as $n \rightarrow \infty$, $a_{n,k} \rightarrow 0$ for each k , and $\gamma_n = \sum_{k=0}^{\infty} (a_{n,k+1} - a_{n,k})^+ \rightarrow 0$. Then for each x in C , $A_n x = \sum_{k=0}^{\infty} a_{n,k} T^k x$ converges weakly to a fixed point of T [?].

Two sets of L^AT_EX parameters govern mathematical displays.¹ The spacing above and below a display depends on whether the lines above or below are short or long, as shown in the following examples.

A short line above:

$$x^2 + y^2 = z^2$$

and a short line below.

A long line above may depend on your margins

$$\sin^2 \theta + \cos^2 \theta = 1$$

as will a long line below. This line is long enough to illustrate the spacing for mathematical displays, regardless of the margins.

3.2 Mathematics in Section Heads $\int_{\alpha}^{\beta} \ln t dt$

Mathematics can appear in section heads. Note that mathematics in section heads may cause difficulties in typesetting styles with running headers or table of contents entries.

3.3 Theorems, Lemmata, and Other Theorem-like Environments

A number of theorem-like environments is available. The following lemma is a well-known fact on differentiation of asymptotic expansions of analytic functions.

¹L^AT_EX automatically selects the spacing depending on the surrounding line lengths.

Lemma 1. *Let $f(z)$ be an analytic function in \mathbb{C}_+ . If $f(z)$ admits the representation*

$$f(z) = a_0 + \frac{a_1}{z} + o\left(\frac{1}{z}\right),$$

for $z \rightarrow \infty$ inside a cone $\Gamma_\varepsilon = \{z \in \mathbb{C}_+ : 0 < \varepsilon \leq \arg z \leq \pi - \varepsilon\}$ then

$$a_1 = -\lim_{z \rightarrow \infty, z \in \Gamma_\varepsilon} z^2 f'(z). \quad (3.2)$$

Proof. Change z for $1/z$. Then $\Gamma_\varepsilon \rightarrow \bar{\Gamma}_\varepsilon = \{z \in \mathbb{C}_- : \bar{z} \in \Gamma_\varepsilon\}$ and

$$f(1/z) = a_0 + a_1 z + o(z). \quad (3.3)$$

Fix $z \in \bar{\Gamma}_\varepsilon$, and let $C_r(z) = \{\lambda \in \mathbb{C}_- : |\lambda - z| = r\}$ be a circle with radius $r = |z| \sin \varepsilon/2$. It follows from (3.3) that

$$\frac{1}{2\pi i} \int_{C_r(z)} \frac{f(\lambda) d\lambda}{(\lambda - z)^2} = \sum_{m=0}^1 a_m \frac{1}{2\pi i} \int_{C_r(z)} \frac{(\lambda - z_0)^m d\lambda}{(\lambda - z)^2} + R(z), \quad (3.4)$$

where for the remainder $R(z)$ we have

$$\begin{aligned} |R(z)| &\leq r^{-1} \max_{\lambda \in C_r(z)} o(|z|) = r^{-1} \max_{\lambda \in C_r(z)} |\lambda| \cdot O(|z| + r) \\ &= \frac{|z| + r}{r} \cdot O(|z| + r) = \frac{1 + \sin \varepsilon}{\sin \varepsilon} \cdot O(|z|). \end{aligned}$$

Therefore $R(z) \rightarrow 0$ as $z \rightarrow \infty$, $z \in \bar{\Gamma}_{\varepsilon/2}$, and hence by the Cauchy theorem (3.4) implies

$$\frac{d}{dz} f(1/z) = a_1 + R(z) \rightarrow a_1, \text{ as } z \rightarrow \infty, z \in \bar{\Gamma}_{\varepsilon/2},$$

that implies (3.2) by substituting $1/z$ back for z . □

Chapter 4

GENERAL FORMAT REQUIREMENTS

4.1 Margins

Text, illustrations (figures) or tables must not appear outside the specified margins. Specific margin requirements are listed in ORDER OF SECTIONS under each category. Page numbers are the only item which may appear outside the margin requirements.

4.2 Corrections on Pages

Do not use correction fluid or correction tape. These materials flake off in handling and storage, exposing the original errors.

4.3 Page numbers

The title page is page 1 of the thesis. All pages which follow are numbered in a single sequence with arabic numerals. Page numbers must be placed at least 1" below the top of the sheet, and 1" from the right edge. The numbers must be at least 1/4" above the first line of text. You may omit the printed page number on the title page; all other pages must have printed page numbers. Do not use page headers. Do not use the phrase, Page xx; just the numeral.

4.4 Photocopy Quality

Photocopies must meet all requirements for margins, readability, and type of paper. This includes all photocopied documents, tables, illustrations and appendix pages.

4.5 Printers

Laser printing or other letter quality printing is required. Impact, or daisy wheel printing is generally acceptable. 24-pin dot matrix near letter quality and draft quality printing are not acceptable.

4.6 Type Fonts

Standard serif typefaces such as Courier and Times Roman reproduce and microfilm well. Do not use modern Sans Serif types, which read well in the original but do not reduce well for microfilming. Ornamental styles such as Script and Old English may

Text Tags	Mathematics Tags	Size Tags
Bold	Fraktur	tiny
Italics	Blackboard Bold	scriptsize
Roman	Calligraphic	footnotesize
Sans Serif		small
Slanted		large
Small Caps		large
Typewriter		huge
		Huge

TABLE 4.1. Available tags

not be used. Limit the use of italic styles to standard uses in bibliographic citations and foreign words. Boldface should be restricted to very small segments of the text and to infrequent occurrences. These text tags are available:

4.6.1 Type Size

Use 12-point or 14-point for proportional fonts; 10 cpi or 12 cpi for non-proportional fonts. A proportional font allows proportional spacing - a feature that gives a printed page a more pleasing appearance by allowing for different widths of characters. The letter w, for example, is wider than the letter i. Normally, when these letters are printed, both are given the same amount of space; the result can be gaps that are visually distracting. With proportional printing, the letter w is given more space than the letter i, creating a more aesthetic and professional-looking line of text.

4.6.2 Typewritten Papers

Papers prepared on good quality electric typewriters are acceptable. All margin, paper quality, and typographic requirements apply. Type size should be Pica (10 cpi) or Elite (12 cpi)

Chapter 5

ORDER OF SECTIONS

Components of your thesis must be in the following order, formatted as specified:

1. Title Page

- Required
- Margins:
 - Top 2.5”
 - Bottom 1.5”
 - Left 1.5”
 - Right 1”
- Spacing: Follow sample

2. Final Examining Committee Approval Form

- Required for dissertations and music documents, not for theses. The approval form for the thesis is included in the Statement by Author (see item 3 below).
- Note: Before the final oral defense the student obtains the Approval Pages from the Degree Certification Office. Original signatures are required on both final copies.

3. Statement by Author

- Required
- Margins:
 - Top 2.5”
 - Bottom 1”
 - Left 1.5”
 - Right 1”
- Spacing: Single
- Note: Follow examples. Original signatures are required on both final copies.

4. Acknowledgements

- Optional
- Margins: Same as Body of Paper
- Spacing: Maybe single spaced
- Note: One page maximum

5. Dedication

- Optional
- Margins: Same as Body of Paper
- Spacing: Must be double spaced
- Note: One page maximum

5.1 Copyrighting the Thesis or Dissertation

Copyrighting of a thesis is optional. Publication by University Microfilms does not preclude publication by other methods later. If you want University Microfilms Incorporated to file, on your behalf, an application for registration of a claim of copyright on your manuscript, you must indicate this on the agreement form you complete for UMI and submit the required fee by certified check or money order. This service includes payment of the registration fee, preparation of the application, and submission of copies required by the Copyright Office.

The ownership of a copyright shall reside with the student unless otherwise stated by University policy or by terms of the research grants, fellowships, financial aid, etc. which were used to support the student's research.

Additional information on obtaining a copyright is available from the Graduate College Degree Certification Office or the United States Copyright Office, Library of Congress, Washington, D. C. 20559.

Appendix A

INCLUSION OF PUBLISHED PAPERS OR MANUSCRIPTS FOR PUBLICATION

Under a policy adopted by The University of Arizona Graduate Council in January, 1992, your department may allow published and publishable papers to be included as part of your thesis. The reprints or manuscripts are treated as appendices, and the body of your thesis must include a summary of your contribution and a summary of the research. The Graduate College will accept theses in this format from any unit with an implementation policy on file with the Graduate College Degree Certification Office.

A.1 Body of Paper

The ORDER OF SECTIONS applies. In addition, the Body of the Paper must include two chapters as follows:

1. An introduction describing the unique contribution of your work to the field of study. Use the following subsections as appropriate:
 - (a) Explanation of the problem and its context
 - (b) A review of the literature
 - (c) Explanation of thesis format This subsection explains the relationship of the papers included and your contribution to each of the papers; where doctoral research efforts are part of a larger collaborative project, you must be able to identify one aspect of the project as your own and demonstrate an original contribution. Your role in the research and production of the published paper(s) should be clearly specified.
2. A chapter titled PRESENT STUDY which summarizes the methods, results, and conclusions of the research. The chapter should begin with a statement such as:

The methods, results, and conclusions of this study are presented in the papers appended to this thesis. The following is a summary of the most important findings in these papers.

A.2 Appendices

All mechanical requirements for Appendices listed in the ORDER OF SECTIONS apply. Your appendices will consist of:

1. A reprint of each paper as a separate appendix in the following order:
 - (a) a copy of the title page of the journal in which the article appeared
 - (b) the statement of permission for use of copyrighted material (see Appendix B: Permissions)
 - (c) the reprint(s), copied single-sided onto the required type of paper
2. Supplementary materials such as data tables, graphs, and maps which might ordinarily appear as appendices to a thesis.

These two types of appendices form a single sequence, assigned letters and titled as described in this manual. All Appendix pages are part of the single pagination sequence of the thesis. The page numbers will be typed in as needed.

Appendix B

PERMISSIONS

Use of copyrighted material in your thesis, including illustrations, usually requires written permission from the copyright holder. Start this time-consuming process as early as possible. Play it safe and assume that you must obtain permission if the material is copyrighted. Consult your advisor or departmental graduate secretary about this process.

Exceptions, sometimes pertaining to small fractions of a musical score or other document, are governed by the concept of "fair use." Factors weighed in determining "fair use" include: the purpose of the use, whether commercial or non-profit and educational; the nature of the copyrighted work; the amount and substance of the material used in relation to the entire work; and the effect of the use upon the potential market for or value of the copyrighted work. The "fair use" concept is explained in detail in the Chicago Manual of Style. According to the Association of American University Presses, permission is required for quotations which are complete units, for example, an entire poem, letter, book chapter, or an entire map, chart, drawing or other illustration.

Permission to use copyrighted material should be in writing and retained by the author. The release letters should indicate that permission extends to microfilming and publication by University Microfilms Incorporated and that the copyright owners are aware that UMI may sell, on demand, single copies of the thesis, dissertation or document, including the copyrighted materials, for scholarly purposes. UMI requires copies of permission letters to be attached to the publication agreement, and assumes no liability for copyright violations. If permission letters are not supplied, copyrighted materials may not be filmed.

It is polite and good practice to obtain permission to use noncopyrighted material, which may or may not be acknowledged in the text.

For additional information, telephone the Copyright Public Information Office in Washington, DC, (202) 479-0700, weekdays between 8:30 a.m. and 5:00 p.m. EST or write to the Copyright Office, Library of Congress, Washington D.C. 20559.

Appendix C

HUMAN/ANIMAL SUBJECTS APPROVAL

Research involving human subjects or live vertebrate animals requires permission from the relevant University committee. Consult your research director for details. If you are working on a project for which your director has obtained the required permissions, be sure your name is listed on the protocol approval and that you have the control number of the approval in your records.

Research activities involving the use of human subjects require the review and approval of the University Human Subjects Committee. A copy of the Human Subjects approval letter along with The Human Subjects Research Statement must be in the student's file in the Graduate College Degree Certification Office. Questions regarding protocol can be answered by the Human Subjects Committee. Their telephone number is (602) 626-6721.

Research involving any live vertebrate animals must be approved by the Institutional Animal Care and Use Committee (IACUC) - The Animal Research Protocol Review form must be completed by the student/instructor and submitted to the protocol office for review and approval. Contact University Animal Care for instructions, forms and protocol. Their telephone number is (602) 621-3454