

**NORTHEASTERN UNIVERSITY
BOUVE COLLEGE OF HEALTH SCIENCES
GRADUATE PROGRAMS IN PHARMACEUTICAL SCIENCES**

Instructions for the Preparation of the Thesis

Revised August 2006

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THE MASTER OF SCIENCE DEGREE

I. General Requirements for the Master's Thesis

A. Please see the Pharmaceutical Science Graduate Guidebook for a discussion of M.S. Registration for a thesis, the composition of the Thesis Committee, general rules about the Thesis Proposal (See Department of Pharmaceutical Science Thesis Proposal Document for detailed instructions about the thesis proposal), and thesis deadlines.

B. Distribution of Copies

Copies of the thesis should be distributed as follows:

1. Reference librarian of Northeastern University Library. This original copy is for the library only and cannot be used for editorial work in preparing a publication or as a printer's copy. It will be cataloged by the librarian.
2. Director of the Graduate School.
3. Program director of area of specialization.
4. All committee members.
5. Student.

II. Organization of the Master's Thesis

The thesis shall contain, in the order given, the following parts, some of which are illustrated or further explained in the appendices.

A. Title Page

This should be prepared as shown in Appendix B.

B. Abstract

A short abstract which describes why the investigation was carried out, what was done, what the results were, and what the results mean.

C. Approval Sheets

Prepared as shown in Appendices C and D.

D. Acknowledgements

E. Table of Contents

This table will be prepared as shown in Appendix E. It contains all division and subdivision headings.

F. List of Tables

If tables are used in the thesis, a list of tables will be prepared as shown in Appendix F.

G. List of Figures

If diagrams, graphs, drawings, photographs or other forms of illustration are used, they will be listed as shown in Appendix G.

H. Introduction

1. Statement of the Problem

This brief description acquaints the readers with the subject of the thesis and justifies the investigation.

2. Review of the Literature

A careful, systematic review of the literature is one of the major parts of a research report. It must be purposeful and must be so organized that it leads the reader to logical conclusions. It should not be an aimless, tiresome, chronological cataloging of tenuously related or isolated facts.

I. Materials and Methods

Keep in mind that a thesis is not restricted in length. It differs from a paper submitted to a scientific journal in this respect, since economic factors are not involved.

Advantage should be taken of this opportunity for full disclosure in all sections of the thesis. *Methods should be reported completely, such that another scientist skilled in the art can duplicate the results.* Often results cannot be confirmed by others owing to the unintentional omission of some critical piece of information. If a modification of a standard method was employed, this fact should be stated clearly, followed by a description of the modification. Be sure to identify and explain any statistical procedures used, including a literature reference. As shown in Appendix H, footnotes are used to give special information; e.g. trademarked name, catalog number, model number and name and address of manufacturer or supplier.

J. Results

This section gives the logic and strategy of the experiments, states how the experiments address the hypotheses and goals of the investigation, explains the data shown in the tables and figures, calls attention to the most significant findings, and cites the conclusion established by the data. The tables and figures should be simple and uncluttered and reviewed for accuracy. Obvious mistakes in scientific reports include errors of computation, e.g., use of **mg** when **ng** or **g** is correct.

K. Discussion

In this section the findings presented under “Results” are interpreted in the context of the Specific Aims guiding the investigation. Alternative explanations should be considered and discussed. The results should be discussed relative to the current literature, and the significance of the data should be assessed. Any recommendations for future work should also be included.

L. Summary and Conclusion

A brief summary of the major findings and the significance of the investigation should be cited here. Include a clear and concise statement of how the work advances knowledge in the field, and how this new knowledge may benefit or improve medical, scientific and/or the public interests.

M. References

References should be cited in the text of the thesis. Citations may be by author and date (i.e. Author and Associate, 1988) or by number (i.e. 1, 2, 3). You must cite the source of your information (references) IN THE TEXT OF THE THESIS, WHERE THE INFORMATION APPEARS. Reference formatting can follow any of the conventional styles used by scientific journals as long as it includes the full article title, all authors and the initial and final page numbers, but the style should be consistent throughout the list of references. Students are strongly encouraged to use bibliographic software (e.g. Endnote™ or Reference Manager™) in preparing their bibliographies. All citations in the text must correspond to an entry in the bibliography and vice versa. See examples below.

1. Hollenberg MD, Cuatrecasas, P. Insulin and epidermal growth factor: Human fibroblast receptors related to DNA synthesis and amino acid uptake. *J Biol Chem* 1975; **250**:3845-53.

(Note that numeric listings are based on the order of the references in the text)

OR

MD Hollenberg and P Cuatrecasas, (1975) Insulin and epidermal growth factor: Human fibroblast receptors related to DNA synthesis and amino acid uptake. *J Biol Chem* **250**: 3845-53.

(Note that citations by author and date are listed alphabetically, and that if identical combinations of authors and dates appear in the text for different references, they must be distinguished from each other by 1988a, 1988b, etc. Up to two authors may be listed as shown above, but for three or more authors, only the first author is listed in the text citation followed by “et al.” [e.g. Cuatrecasas et al., 1988], but all authors are listed in the bibliographic listing.)

In most cases, references should be to peer-reviewed published literature, but it is acceptable to cite web pages when using downloaded figures that are not available from other sources.

Conventional abbreviations of most scientific journals can be found in “Chemical Abstracts” or online at www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=journals. To use the PubMed journal function, type in the full title of your journal, press go, and find the ISO abbreviation under your journal title.

III. Physical Preparation and Format of the Master’s Thesis

A. Typing

The thesis original must be printed with a laser printer using a size “12” font and must be printed on archival quality (16 weight or higher) acid-free white bond paper 8½x 11”. The typing must be legible, double spaced, and on one side of the sheet only. The margin at the top and bottom must be one inch. A minimum one-and one-quarter inch margin must be allowed on the left and right for binding and trimming. Copies must be clear and clean. See www.lib.neu.edu/archives/collect/thesis.htm for requirements.

B. Numbering

All pages will be numbered consecutively with Arabic numerals with the first page of the introduction being considered as page 1. All subsequent pages fall into this

numbering sequence including the appendices. The numerals will be placed just touching the right hand margin two spaces above the margin. No hyphens should be used with the numerals. Numerals should not appear on the title page or any subsequent pages bearing the title of a main division, such as the introduction. Lower case Roman numerals must be used to number consecutively all pages (except the approval sheet) preceding the first page of the introduction. Here again, the title page will bear no numeral even though it is assigned the Roman numeral, i. However, the approval sheet bears no numbering, actual or implied.

C. Special Requirements for Tables and Figures

Drawings, formulas, diagrams, graphs, and mathematical equations should be typed. Xerox duplicates of tables and figures are acceptable. Legends for tables and figures preferably appear directly below the table or figure.

D. Source Material on Writing

It has not been the purpose of this pamphlet to give complete instructions on the writing of a thesis. If more guidance is needed, there are numerous excellent publications, some of which are mentioned here, that may be consulted.

1. **Webster's New Collegiate Dictionary. Springfield, MA: E.C. Merriam.** This book should be used for precise meanings, preferred spellings, proper hyphenation, and pronunciation. Also available online at <http://www.m-w.com/>.
2. **Kate L. Turabian *A Manual for Writers of Term Papers, Theses, and Dissertations (Chicago Guides to Writing, Editing, and Publishing)*. Chicago: U. of Chicago Press. 1996.** This, or similar manuals, can serve as a good general source of information on organization, writing, grammar, punctuation, phraseology, and typing. It shall not supersede the specific directions given in this pamphlet.
3. **Robert A. Day, Barbara Gastell *How to Write and Publish a Scientific Paper*. 6th ed. Cambridge: Cambridge University Press, 2006**
4. ***A Manual of Style*. 15th ed. Chicago: U. of Chicago Press, 2006.** Soon to be available online at <http://www.chicagomanualofstyle.org/index.html>
5. **William Strunk Jr., E.B. White, Roger Angell *The Elements of Style*, 4th ed., Allyn & Bacon (hardcopy), 1999 or Longman (paperback), 2000.** There is also an illustrated 5th edition.

THE DOCTOR OF PHILOSOPHY DEGREE

IV. General Requirements for the Doctoral Thesis

- A.** Please see the Pharmaceutical Science Graduate Guidebook for a discussion of Ph.D. Registration for a thesis, the composition of the Thesis Committee, general rules about the Thesis Proposal (See Department of Pharmaceutical Science Thesis Proposal Document for detailed instructions about the thesis proposal), and thesis deadlines.
- B. Distribution of Copies**
See Section I.B for the M.S. thesis.

V. Organization of the Doctoral Thesis

The format for the thesis should be followed as indicated for the MS thesis and outlined in the appendices.

VI. Guidelines and Requirements for Thesis Work Conducted in Off-Campus Laboratories

- III.** The M.S. or Ph.D. thesis requires independent original research by the student.
- IV.** Students are permitted to conduct their research in an off-campus laboratory or facility when on-campus facilities are inadequate for the project planned. This arrangement is subject to mutual agreement of the student, person in charge of the off-campus facility, the student's N.U. thesis advisor, and the Graduate Program Director.
- V.** Primary competence, project approval and supervision are the purview of the N.U. thesis advisor.
- VI.** The off-campus supervisor must be on the thesis committee and may serve as its co-chairperson. All thesis committee members are expected to attend regular, required thesis committee meetings.
- VII.** The thesis committee as a whole is responsible for acceptance of the thesis proposal and the completion of the student's entire doctoral program. The thesis proposal then consists of a preliminary agreement on what constitutes completion of laboratory work or data collection; but it is subject to change at the discretion of the student with the committee's approval.
- VIII.** The student is responsible for scheduling regular meetings with the campus thesis advisor to inform her/him of her/his off-campus progress.
- IX.** The student must be listed as an author of any journal publication resulting in the thesis work. The student's address must be listed as from the appropriate program, Graduate School of Bouvé College of Health Sciences, Northeastern University, Boston.

- X.** The Graduate Program Director requires a letter from the student and from the committee agreeing to the above conditions and including the following information:
- 1.** The student's name.
 - 2.** Title of thesis project.
 - 3.** Name and affiliation of person in charge of laboratory.
 - 4.**
 - 5.** Location of laboratory.
 - 6.** Research support:
 - a)** Off-campus facilities, equipment and supplies. (Are these from a grant or contract source? If so, is there a terminal date of this research support?)
 - b)** Which N.U. department facilities, equipment and supplies are needed?
 - 7.** Access to facilities: When and under what circumstances may the student use the facilities to work on this research?
 - 8.** Employment status: Is the student employed by the off-campus supervisor or institution? If so, will the student be reimbursed for services rendered while working on the thesis? To what extent will the student be engaged in thesis work during regular working hours?
- XI.** The final decision on approval or conditions for a thesis done off-campus rests with the Graduate Program Director.

VII. Appendices: Sample Formats

A. For the M.S. or Doctoral Thesis Proposals, please consult the Department of Pharmaceutical Science Thesis Proposal Document for the specific document for the Thesis Proposal.

B. Sample Thesis Title

Title Page

THE USE OF ATTAPULGITE CLAY
AS A COMPRESSED ENTERIC TABLET COATING

Thesis Presented

by

Gustave Toutant Beaufort

to

The Bouve' Graduate School of Health Sciences
in Partial Fulfillment of the Requirements for the Degree of Master of Science/
or Doctor of Philosophy (specify which) in Pharmaceutical Sciences
with specialization in
Pharmaceutics

NORTHEASTERN UNIVERSITY
BOSTON, MASSACHUSETTS

June, 1979

C. Signature page 1 (Signed by Dean and Library)
Northeastern University
Bouve' Graduate School of Health Sciences

Thesis title:

Author:

Program:

Approval for thesis requirements of the Master of Science Degree/or Doctor of Philosophy (specify which) in Pharmaceutical Sciences.

Thesis Committee (Chairman)	_____	Date _____
	_____	Date _____
	_____	Date _____
	_____	Date _____
	_____	Date _____
Director of the Graduate School	_____	Date _____
Dean	_____	Date _____
Copy Deposited in Library	_____	Date _____

D. Signature page 2 (Not signed by Dean or Library)

Northeastern University
Bouve' Graduate School of Health Sciences

Thesis Title:

Author:

Program:

Approved for thesis requirements of the Master of Science Degree/or Doctor of Philosophy (specify which) in Pharmaceutical Sciences.

Chairman: _____ Date _____

Thesis Committee: _____ Date _____

_____ Date _____

_____ Date _____

_____ Date _____

Director of the Graduate School _____ Date _____

E. Sample Table of Contents

Table of Contents

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LIST OF FIGURES	
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i. STATEMENT OF THE PROBLEM	
ii. REVIEW OF THE LITERATURE	
MATERIALS AND METHODS	
RESULTS	
DISCUSSION	
SUMMARY AND CONCLUSIONS	
REFERENCES	
APPENDIX	

F.

List of Tables

Table (examples)	Page
1. Disintegration Times of Different Tablet Coatings	
2. Species Variations for <i>In Vivo</i> Tablet Evaluation	

G.

List of Figures

Figure (examples)	Page
1. Diagram of Different Enteric Coatings	
2. Effect of Tableting Pressure on Disintegration	
3. Photograph of a Mamesty Tablet Machine	

H.

Footnotes

Consecutive full-sized numerals as superscripts¹ at the end of a citation should be used for all footnotes. For example, one might mention the generic drug Tripelenamine Hydrochloride², hence, it would be helpful to mention its trademark name and source in a footnote.

Footnotes require an inch and a half underlining two spaces below the last line of text and starting at the left margin (see below). The last line of footnoting must end before the bottom margin. The sequential superscript numbers are used to precede the footnotes. Typing is single spaced. Complete sentences are not required since brevity is essential

¹Lower case letters are used to footnote tables.

²Pyribenzamine Hydrochloride, Ciba Pharmaceutical Co., Summit, NJ.

I. Library Regulations for Thesis Acceptance

A. General Regulations

The thesis must:

- I. Be the original printed on archival quality paper using a laser printer. Check the library's website at <http://www.lib.neu.edu/archives/collect/thesis.htm> for the most recent requirements.
- II. Have Two Approval Sheets
 - a. One signed by Dean and the Librarian (see Appendix C)
 - b. And one which does not have Dean's and library signatures (see Appendix D)
 - c. The copy signed by the library is returned to the graduate school and deposited in the candidate's file. The second approval sheet remains with the library's thesis/dissertation.

B. Master's Thesis

I. Binding Fees

- a. Library does not pay any binding fees for Master's theses.
- b. Graduate school M.S. theses usually do not need to be bound.
If the candidate would like the thesis bound, she/he can pay the University bindery or locate an outside vendor.

2. The candidate should include name, address and phone number. The library will contact the candidate when the thesis is returned from the bindery.

II. Binding Timetable – 2-3 months.

- III. If several copies are to be bound, mark the original "orig" in pencil in the upper right corner.

C. Doctoral Dissertations

- I. Joining the UMI (University Microfilm International) program is optional.

Applications are at the Library Reference Desk and on the Internet at www.umi.com.

- A. if the candidate chooses to join, she/he should be sure to sign the agreement form on the back after filling it out. All theses listed with UMI are available online.

- B. Copyright authorization is optional. If desired, the candidate must sign the bottom of the form and include a fee payable to University Microfilms International.
- II. The candidate must provide an extra copy of the abstract – not over 300 words (UMI counts punctuation) – and must also provide a copy of the title page.
- A. Abstract which remains with dissertation can be any length.
 - B. No charge for binding.