SCHOOL OF MEDICINE & DENTISTRY
UNIVERSITY of ROCHESTER MEDICAL CENTER

# Guidelines for a Statistics PhD Thesis Document

## 1. Purpose of this document

This document provides a guide for the structure and content of a Statistics PhD thesis document. Because thesis topics and methods vary greatly, the requirements for any given thesis may vary from the guidelines presented here as is required to facilitate coherent presentation. However, notwithstanding such exceptions, the structure and content provided below is the standard for a Statistics PhD thesis at the University of Rochester.

This document is meant to be a supplement to the general guidelines of the University of Rochester for preparation of a thesis ("Preparing Your Thesis: a Manual for Graduate Students"), which can be found at the website http://www.rochester.edu/Theses/ThesesManual.pdf, and which governs all theses at this university. This document does not supersede the general guidelines.

## 2. Overview of thesis contents

A thesis is a description and interpretation of the research conducted by the candidate that qualifies him/her for the degree of PhD.

Wherever possible (particularly the introductory and final chapters), the thesis should be written so that the material is accessible to those not working in the specialized area of research. Every member of the thesis examination committee should be able to understand the main ideas in the document as a whole, and the details of each section must be understandable to at least one committee member with the expertise to verify that its content is sound.

The document should be written in English with correct spelling and grammar. It is not the job of the committee to proof-read the text. Having the text of the thesis corrected and edited for clarity by a second person is acceptable and highly recommended. A committee member can refuse to accept a thesis with excessive grammatical or typographical errors.

There is no formal minimum or maximum length. The thesis must give an in-depth account of the background and the research question addressed, as well as a detailed description of the methods and results that is typically more specific than that found in the published literature.

## 3. Organization of the thesis

The manual titled "Preparing Your Thesis: a Manual for Graduate Students" outlines the overall structure of the thesis in terms of general formatting and required parts such as the Title Page, Abstract, etc. This manual should be consulted for specifications regarding these components. This manual, however, does not address the substantive chapters of the thesis. That guidance is provided herein.

A PhD thesis in Statistics is expected to involve the development of novel statistical methodology and/or provide important contributions to the theory of statistics. It should consist of original work of publishable quality that addresses a unified theme, as opposed to a collection of unrelated methodological developments.

A Statistics PhD thesis will typically contain five chapters (although this may vary):

**Chapter 1. Introduction**

This chapter introduces the research problem and outlines the relevant background. While expansive details of all relevant published works should be avoided, this chapter should summarize all pertinent scientific literature to provide the information necessary for understanding what is currently known and how the thesis will contribute in an important way to expanding this knowledge. This chapter provides the requisite arguments to establish the importance of the problem as a statistical research topic. Often, example data from actual scientific studies are highly useful for motivating the research problem. The chapter should conclude by briefly summarizing the research approach to the thesis and the organization of the remaining chapters.

**Chapters 2-4. Distinct Aspects of the Research**

Each of these chapters typically addresses a distinct sub-problem related to the general theme of the dissertation. The mathematical development of the novel methodology should be presented in detail. New theorems and proofs (as well as relevant existing theorems) should be provided as necessary for analytical evaluation of the properties of the new methods. Simulation studies may be necessary to empirically evaluate the properties of these methods; the simulation designs should be described in sufficient detail to allow replication of the results by others. Comparisons should be made to existing methods, if any, for addressing the same research problem. Results of the evaluations should be clearly and thoroughly presented in figures and tables that are self-contained.

Example data from actual scientific studies should be used whenever possible (and applicable) to illustrate the utility of the new methodology.

**Chapter 5. Conclusions and Future Work**

The final chapter should discuss the research findings in a unified framework and provide an overall perspective for the reader, including limitations of the research and future work to be performed. It may be helpful to briefly recapitulate the state of the field at the outset of the research, summarize the main results of the thesis, explain how the current work provides an important contribution to existing knowledge, point out any limitations of the newly-developed methods, raise new questions that may have arisen out of the research, and propose future work to address existing gaps in knowledge.