580210S Master’s thesis (35 credits)

GENERAL GUIDELINES FOR WRITING A MASTER’S THESIS

The phases and responsibilities of a Master’s thesis are described in the section Phases of the Master’s thesis (Appendix 1).

1. Starting the thesis and approval of the topic

Starting the thesis

You can start working on your Master’s thesis when you have advanced enough in your studies (230-250 credits). The topic should be selected primarily in your own field of studies. The nature of the work may vary significantly. The thesis may be written in a University research group, a company or a healthcare organisation. The student should consider and find a topic in which they are interested. Selecting and narrowing down the topic are the most important phases of preparing the thesis, and a good amount of time should be used on this. When the topic has enough structure, the student should contact the professor from the degree programme in order to receive their approval for the topic and content of the thesis. At this point, the student should fill out the Topic proposal form. The Topic proposal is available in Optima (Opintoneuvonta → Instructions and forms in English → Topic proposal for Master’s thesis).

Research plan and supervision

Work on the Master’s thesis should begin by writing a research plan that introduces the background, contents and realistic schedule for the thesis. In addition, an objective or objectives should be set for the thesis, i.e. defining a problem that the thesis seeks to answer. The problem can be formulated in the form of a few simple questions. At this stage, the topic may also be defined further, or in other words, it should be decided what not to include in the study. It is important to narrow down the topic to prevent the work from becoming too vast as it progresses. Matters related to choosing research methods and acquiring material should be discussed with the supervisor. When the objectives are clear, choosing the methods and other planning work will become easier. The
recommended length for the research plan is 2 – 5 pages. The research plan may consist of the following things: background for the research, objectives and hypotheses, implementation, research group and environment and the research schedule.

The Master’s thesis corresponds to six months of full-time work by the student. In order to ensure the smooth progress of the thesis, regular meetings with the supervisor are beneficial. The meetings will structure and clarify the thesis process.

2. Writing the thesis

The thesis should consist of approximately 50 – 60 pages. The thesis must be written in Finnish, Swedish or English.

Title page

The title of the thesis should be in the middle of the first page, and the student’s name, the type (Master’s thesis), study programme (Degree Programme in Medical Technology), department (Institute of Biomedicine), university, and the year (Appendix 2) should be at the bottom of the page. The template for the title page is available in the end of this document.

First pages

The Title page is followed by the abstract, foreword, abbreviations used, and the table of contents. At the top of the abstract page, the bibliographic information of the thesis is presented (Appendix 3). The abstract is an independent presentation that introduces the purpose of the work, methods used, results obtained as well as conclusions. The recommended length for the abstract is 200 words. The abstract should be written in both Finnish and English. The keywords in the abstract should be placed below the text. The recommended number of keywords is 3-6 words or word pairs. The keywords are selected so that they are not visible in the title but describe the most important aspects of the work. The name and keywords will be used in literature searches.

A foreword may be attached to the thesis, introducing the research and its possible background organisation. The foreword may also acknowledge the supervisors, other parties who have participated in the work as well as the financiers of the research.

The abbreviations, measurements and units and other signs should be explained as one list on the following page. The accuracy of the explanation must be verified from standards or other sources. The internationally approved SI measurement system must be observed. The most common units in the SI system require no explanation (e.g. kg and cm). The abbreviations must be listed in alphabetical order.

The abbreviations should be followed by the table of contents, which should present the chapters with subheadings and page numbers. The titles of the first pages (abstract, foreword, abbreviations and table of contents) shall not be numbered. There will be no page numbers marked on these pages. Page numbers should start from the page following the title page of the first chapter.
Text

The actual text typically consists of the following chapters:

- Introduction
- Literature review / Background for the research
- Research objectives / Research questions
- Materials and methods
- Results
- Reflection
- Abstract

Depending on the nature of the thesis, the structure may differ from the above. In order to facilitate reading, subheadings may be added to the chapters to structure the text.

*The introduction* serves the purpose of introducing the topic to the reader as well as the motivation behind the work. In addition, the definition of the extent, manner of implementation and the aims set for the thesis as well as the scope of the research will be presented and justified. The introductory chapter may refer to previous studies closely related to the field of research. The length of the introductory chapter is 1–2 pages.

*The literature review* presents the theoretical background for the work and clarifies what kind of studies have been previously made on the topic and which methods have been used. In addition, it should be explained how the research being performed relates to previous research. A literature review that has been well done shows the information missing from the studies on the research topic, in other words the research gap, and the possible contradictions in previous research results that have, on their part, motivated the student’s research setup. The more clearly the research questions have been defined, the easier it is to limit the literature review in a manner that supports the research questions. This also facilitates selecting research methods. Depending on the topic, it is advisable to use different medical or technical databases (e.g. MEDLINE, Scopus, Web of Science and Scirus) when writing the literature review. The objectives and research questions should be presented in their own chapter that expresses the aim of the thesis clearly in one or two sentences.

*Materials and methods* chapter explains how the research has been conducted: which materials have been used, how much material there is and how it has been processed. The methods are described in such detail that another researcher may repeat the research if needed. There is no need to refer to basic methods, but when using less common methods, the reference is needed. The methods of statistical analysis should also be described in the methods.

*The results chapter* presents the results of the work systematically and clearly. In this chapter, all research questions will be reviewed, also the ones that could not be answered. In addition to the text, pictures and charts can be used as demonstrative aids. However, the results should not be repeated so that they would be presented both as text and chart. However, a phenomenon or major observation presented in a picture or chart should also be mentioned in the text. In addition, the pictures and charts should be referred to in the text.

*The section on reflection* considers the new information that the research has produced and reflects on the student’s own results in relation to previous information. In addition, it should be considered whether the results can be generalised, and the possible weaknesses and ideas for further
development shall be listed. You can start examining the results by briefly mentioning, for example, the aims of the research and the most significant results. Then the results shall be compared with theory, i.e. information obtained through literature and other sources.

The abstract is the last part of the thesis. It briefly presents the conclusions that can be made based on the whole study and the recommendations that are possible to give based on the research.

The language of the thesis must be good, written in a scientific style and the sentence construction must be clear. When writing, it is also important to pay attention to spelling. Loan words should be avoided if there are equivalent words in Finnish that sound natural. Abbreviations can be used if they fit the style of the scientific presentation and if they are clear. When using an abbreviation for the first time, it should be written in its entirety (e.g. WHO (World Health Organization)).

References and appendices

Referencing means references to sources within the text as well as a bibliography. When writing the thesis, the sources used must always be referenced, i.e. whose text or ideas one is using. The readers must be able to easily distinguish between the writer’s own text and what has been taken from somewhere else – and from where. Being specific helps the reader to identify and locate the sources, and shows in which source the original information in the statement can be found. In addition, using references means acknowledging the work of other researchers. Sometimes the information is so general that references are not necessary. If the information is general knowledge in the field, there is no need for source references.

Plagiarism means using someone else’s ideas, text, results or material without referencing the source. This kind of procedure is unethical and illegal. In order to discover plagiarism, the Urkund programme is used at the University of Oulu. The University of Oulu procedures in processing cases of plagiarism can be found in Optima, in the same folder as this document.

Direct quotations (citations) must be used very sparsely, and they should be as short as possible. Direct quotations should be used only when the original text expresses an idea so concisely and convincingly that it would lose its accuracy or be deformed when put in other words. A short direct quotation should be written inside quotation marks, and it must be in exactly the same form as in the original text.

Sources should be identified both in the text as internal references as well as in the bibliography. The references in the text and the bibliography must be equivalent, i.e. the bibliography should only contain sources that have been referred to in the text. Through the University Library, you can use the RefWorks reference management programme, which makes it easy to add references and to write the bibliography. More information on RefWorks is available on the library webpages (http://www.kirjasto.oulu.fi/index.php?id=255).

When referencing sources, the University of Oulu reference procedure should be used (Acta Universitatis Ouluensis, more information at http://www.kirjasto.oulu.fi/index.php?id=427). The references may be either numbered consecutively and listed in the order of appearance (numbered references system) or the name-year system can be used in referencing, where the reference to the bibliography is in the following form: (last name, year of publication). Internet sources must also be referenced, and the same basic rules apply to them as to printed sources. An abundance of literature has been published on referencing and it is worthwhile to familiarise oneself with it.

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The appendices should be numbered consecutively (e.g. Appendix 1, Appendix 2, etc. or Appendix A, Appendix B, etc.) and they should be presented at the end of the thesis. Each appendix shall be named in a manner descriptive to it. The appendices should not have page numbers. If the appendix has multiple pages, its own numbering shall be marked in the upper right corner of the page (e.g. 1/3 etc.).

**Some general guidelines on formatting**

1. Recommended fonts (size 12)
   a) Times New Roman
   b) Arial
   c) official University fonts Gill sans and Perpentua
2. Spacing 1.5; charts and captions 1.0
3. Margins: upper and lower 3.0 cm, left 4.0 cm and right 2.0 cm
4. The text should be aligned on both sides.
5. Several levels of subheadings should be avoided in order to not make the text too fragmented.
6. Numbering in charts (in bold) and their headings (no formatting) should be placed above the chart. The charts should be numbered in order of appearance.
7. Numbering pictures (in bold) and captions (no formatting) should be placed below the picture. The pictures should be numbered in order of appearance.
8. The charts and pictures must have a so-called textual reference, i.e. they must be referred to in the actual text with the number of the chart or picture (e.g. Chart 1 or Picture 1).
9. The charts and pictures must be comprehensible as such, without reading the text.
10. The tense in the writing must be logical throughout the text (Introduction: present, past and present perfect, Conclusion: present perfect and simple present, Methods section: simple past tense or present perfect in passive).

3. Evaluating the Master's thesis

After the examiner/examiners of the thesis grant permission for binding the thesis, it will be submitted for binding. The colour of the front cover is black, and the text MASTER’S THESIS will be printed in the middle in golden letters. The name of the student will be printed on the lower right hand corner of the cover. The name of the student and the year will be printed on the spine.

After binding, the thesis will be submitted for evaluation. The Faculty’s Master’s Thesis Evaluation Board will evaluate the thesis based on the examiner’s statements. Appendix 4 is a form filled in by the evaluators that explains the factors to be considered in the evaluation process. The Evaluation Committee meets approximately every second month. The meeting dates can be confirmed at the unit. The thesis will be evaluated using grades 1-5.

Two bound copies, one unbound copy and one electronic copy (pdf or doc) of the finished thesis should be submitted to those in charge. One of the bound copies will remain in the Medical Technology Library and the other will be delivered to the Faculty Library. The electronic version will be archived in the Medical Technology archives.

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# Phases of the Master’s thesis

## 1. Starting the thesis and approval of the topic

- Familiarises him/herself with the general guidelines for thesis writing
- Updates and maintains the guidelines
- Considers/searches for/examines a topic for the thesis
- Offers possible alternatives for thesis topics
- Contacts the professor responsible for the course
- Negotiations on the thesis topic, focus and process with the supervisor and the professor in the degree programme
- Filling in and signing the Topic proposal for Master’s thesis
- Planning the schedule and meetings

## 2. Writing the thesis

- Discussion on the essential parts of the thesis in regular meetings
- Preparing the first draft of the research plan
- Feedback
- Editing the research plan based on feedback
- Writing the literature review
- Provides guidance when needed
- Acquiring and processing material (possible experimental part)
- Feedback and guidance
- Analysing results
- Feedback and guidance
- Writing
- Feedback and guidance
- Finishing the first draft of the thesis and submitting to the supervisor
- Feedback and guidance
- Writing continues, editing the text based on feedback
- Several editing phases according to needs

## 3. Approval of the thesis

- Submitting the thesis to the supervisor for examination.
- Review and corrections or giving permission for binding the thesis
- After the examiner/examiners grant permission, the thesis will be bound
- Submitting the thesis for evaluation: Two bound copies, one unbound copy and one electronic copy (pdf or doc) of the finished thesis to those in charge. In addition, it is recommended that the supervisors and examiners receive their own copies.
- The Master’s Thesis Evaluation Committee evaluates the bound thesis based on the examiners’ statements. The Evaluation Committee has meetings approx. every second month. You can confirm the meeting times at the department.
- Approval of the credits and registering in the study register
- Internal archiving of the thesis: 1 copy to Faculty Library, 1 copy to Medical Technology Library, unbound copy and an electronic version for the Medical Technology archives
| Maturity test 580211S: The student can take the maturity test when the thesis has been submitted for examination. The student should agree with the professor on taking the maturity test. Guidelines for writing the maturity test can be found on the webpages of the Extension School. In the Master’s phase, the abstract for the Master’s thesis in Finnish or Swedish can be accepted as a maturity test. |
| Content check of the maturity test (professor in the degree programme) |
| If the student has not passed the maturity test already for a lower university degree, the language of the test will also be checked. |
TITLE OF THE MASTER’S THESIS

Student Smith
Master’s thesis

Degree Programme in Medical and Wellness Technology
Institute of Biomedicine
University of Oulu

2012

18.10.2012

Abstract

When reporting the bibliographic information of the thesis, the last numbered page of the publication will be reported as the number of pages. The appendices that have not been numbered shall be calculated separately (e.g. 70 p., 2 appendices). The bibliographic information is followed by the abstract and keywords immediately below the abstract text.

Keywords: Master’s thesis, writing guidelines…
EXAMINER'S STATEMENT ON THE THESIS

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Thesis

- Bachelor’s thesis in Health Sciences
- Master’s thesis in Health Sciences

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Thesis evaluation

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Proposal for grade:

______________________________ of _______ _______

Examiners: ______________________________ ______________________________

Name (in print): ______________________________ ______________________________

Degree and title: ______________________________ ______________________________

Comments and/or verbal evaluation of the thesis as an appendix.

Grading of Master’s thesis: laudatur, eximia cum laude approbatur, magna cum laude approbatur, cum laude approbatur, non sine cum laude approbatur, lubenter approbatur, approbatur

18.10.2012