



Guidelines for the master's thesis

1. Introduction

Every master's degree requires the fulfillment of a master's thesis.

The master's thesis consists of a personal and original manuscript demonstrating a student's ability to identify scientific or technological issues and to mobilize his/her knowledge, skills and competences into a logical and coherent scientific methodology. The topic chosen should fit in the chosen specialization.

The master's thesis in Architectural Engineering consists of three parts: a scientific part, an architectural design project and the mutual interaction between both parts. The master's thesis may be carried out jointly by two students. In this case, the manuscript and the oral presentation must allow the jury to assess individual contributions.

This document provides guidelines on how to write your master's thesis. For additional aspects such as regulations and obligations, it is recommended to consult the VUB Engineering faculty and Bruface exam rules (chapter V: master's thesis).

2. Planning

The work allocation is not strictly fixed. Both the content and the work allocation can vary during the academic year, depending on the progress of the thesis or depending on the department in which the thesis is done. Hence, it is advised to contact the responsible within the department to be aware of the work allocation within the department.

During the academic year, usually several meetings and preparatory defenses are being organized. The aim is to follow up the advancement of the thesis and to further elaborate it via critical questions and discussions.

In Architectural Engineering, the supervisor of the design project will organize multiple intermediate moments of evaluation (juries). The supervisor of the scientific part of the thesis is invited to participate in these juries to ensure the mutual interactions of the design project and the scientific project.

3. Layout and content

A thesis should be presented in a professional manner, since it is a report of the activities and the research that the student has accomplished during the year. The marks are given, taking also the presentation and layout of this work into account.

The thesis should present the work in a synthetic, clear and condensed way. The length of the main body (without appendices) is recommended to be 60 pages (A4) per student. In case of a Bruface program, this length is strictly limited to 60 pages. Any appendices necessary for a detailed understanding of the content should be added. Every submitted hard copy should be double-sided.

In case of Architectural Engineering this length only applies to the scientific part of the thesis. If the thesis consists of two separate documents (e.g. scientific part and design part), the student should explicitly refer to the other document whenever this is needed for the thorough understanding of the content.

Plagiarism

Plagiarism is (literally) copying concepts, techniques, tools, equations, data, illustrations and/or text from others, without referencing in a correct way to the (original) source. A correct reference should be placed close to the copied content and it is not sufficient to add a reference in the bibliography. Committing plagiarism is not only unethical, it is also a form of fraud and it can have serious consequences for the student. It is an equivalent of copying someone's notes during an exam and therefore the student can be excluded from the whole exam period or even from the university.

Be aware of the fact that recently developed software made it easier to track plagiarism!

I. Formatting

Templates for the cover and the main body text are made available in .odf, .docx and .tex. In this way the student is provided with guidelines concerning format, numbering and typography.

There exists word processing software (e.g. Word, LaTeX, LyX) able, when properly used, to do the typesetting, numbering (of pages, chapters, sections, equations, figures, ...), table of contents and list generation, cross-referencing (to different parts of the text) and referencing (citations and bibliography management) uniformly and automatically throughout the whole text. This is common practice in scientific communities. However, it is advised not to start writing the thesis without knowing the software beforehand. You can ask for advice to the members of the department.

Language

The master's thesis must be written in English for the students registered in the full English master, in Dutch or English for the students registered in the Dutch master.

Format

The maximum dimensions for the paper version of the thesis are limited to A4 format. For exceptional reasons and in consultation with the supervisor, other formats may be used.

In the case of Architectural Engineering, the scientific part is typically presented on A4 format whilst the design project is presented on A3 format. If larger formats are needed (e.g. for plans), they can either be added in the design portfolio or as appendices. Different formats should be discussed with both supervisors in advance.

Page numbering

Besides the cover and title page, each printed page displays a page number. In a thesis, the numbering of the main part starts at the introduction with Arabic numerals. Prior introductory pages may be numbered in a different way. Although the first pages of each major part (the introduction, the main divisions of the corpus) are included in the numbering, those page numbers are not displayed.

Typography

The typography of the master's thesis should be taken care of. Spelling practice, the use of capitals, etc should be done according to the rules. Check your text repeatedly.

Be sure to include sufficient margins to ensure the readability of the bound document.

Splitting words should be avoided. The hierarchy of titles should be clear and coherent.

II. Content

Cover

The cover of the master's thesis manuscript must include the following items:

- Top: the appropriate logos (VUB, ULB, Bruface or any others)
- Middle: the full title and the student's name (first name and family name)
- Bottom left: Academic year 20XX-20XX
- Bottom right: Master's thesis submitted under the supervision of Prof. (first name and family name), the co-supervision of Prof. (first name and family name), in order to be awarded the Master's Degree in (degree title).

Preface

The preface is an optional part of the work. It contains no element that is essential in connection with the main subject. However, it offers the opportunity to present how the work submitted has come about and the student's original motivation. A preface also allows the author to express appreciation or gratitude to all people who have contributed to the achievement of the work. These persons are listed with their academic titles. Institutions such as libraries and scientific institutions may be involved in the acknowledgments.

As the preface is not an actual part of the work, it is placed before the table of contents, immediately after the front page.

Abstract

Each master's thesis must start by a one-page abstract written in 3 languages (English, French and Dutch) and must include the following information: the student's name, the master's degree full title, the academic year, the master's thesis title, a list of max. 6 keywords, and the abstract. The latter must briefly layout the objectives, methodology, main results and conclusions.

Table of contents

The table of contents allows the reader to situate the different parts in a quick and easy way.

List of abbreviations, list of symbols, list of figures and list of tables

The use of abbreviations should be restricted to a minimum. It tends to disturb the smooth readability of the text. If using them anyway, then the abbreviation must be indicated least a few times in full writing so that the reader can understand the text without explanation.

If many abbreviations are present and if desired, a list of abbreviations can be added.

Physical quantities are very often presented as a (standardized) symbol. Care should be taken to make sure that each quantity is consistently represented by one and the same unique symbol. In that case a symbol list should be added. The symbol list mentions the symbol, together with a brief and clear description and (if relevant) its dimensions. If a (universal) constant is represented by means of a symbol, its numerical value should also be provided.

If considered useful, a list of figures and a list of the tables can be added to complete the overall picture.

The above mentioned lists are preferably placed after the table of contents and before the introduction.

Structure of the thesis

The thesis consists of several chapters. The introduction, conclusions and future perspectives are imperative in each thesis. The introduction should present the purpose of the thesis in a concise

manner and give an overview of the topics covered in the following chapters, with an emphasis on personal work.

Illustrations

Illustrations are figures or tables. Figures are drawings, sketches, diagrams, charts, histograms or graphs. Unnecessary illustrations should be avoided. Tables and graphs can sometimes display the same information. One chooses the illustration type such that the illustration fits best with the text.

Illustrations are placed as close as possible to the relevant text section, unless a large number of them are present, or in case the illustrations need to be checked throughout the whole thesis.

It is recommended to use high-resolution illustrations. Care should be taken when choosing image file formats. Certain lossy compression formats, such as .jpg, are adequate for photographs, but in general inadequate for non-photographic illustrations. The bitmap format (.bmp) can also degrade the quality significantly or generate very large file sizes. Vector-based formats (such as .svg, PostScript, .pdf) are preferred for graphs and schematics, because of their high quality.

All illustrations must be numbered and labelled (caption). Number and label are placed on top for tables, and at the bottom for figures. The labels must be as short and precise as possible, and can be supplemented by guidance text. Ideally, each illustration with its caption should be able to stand on its own, independently of the main text. This means that the label and the accompanying text should be sufficient to understand the content of the illustration. Thus, all abbreviations in the illustration must be accurately explained in the accompanying text. The units are always mentioned between parentheses. Always insert a zero before the decimal point (example: 0.01 instead of .01). Pay attention to rounding off number of digits. Take care that all similar figures are designated with the same accuracy. If several drawings or photographs apply to the same subject, draw them on the same scale. Small text fonts in the illustrations (e.g. for axis labels, titles and legends) should be avoided.

Reference list

A reference list (bibliography) is placed at the end of the thesis. It permits to explicitly identify each reference that was mentioned in the text. All references made in the text should be included in this list.

Different reference styles are used for scientific writing. Ask your supervisors for the style used in your department.

The two most often used reference styles are:

- numbering every publication in the text in between square brackets (bv. [2]) and adding each reference in the numbered reference list sorted chronologically by appearance in the text
- indicating every publication in the text by citing author(s) and date (bv. (Smiths, 2000)) and adding each reference in the reference list sorted alphabetically per author

The reference list contains:

- for articles: family name and initials of all authors, date, full title of the article, title of the journal abbreviated by international agreements, volume number, first and last page of the article.
- for books: author(s), date, title of article or chapter and of the book, edition, place of publication, publisher
- for websites: author, title of webpage, weblink, date of last access (only refer to scientifically correct websites and limit the number of website references in your master's thesis)

Appendices

When necessary, appendices can be added to your master's thesis (if needed in a separate volume or digitally). This might also be necessary for confidentiality conditions. An example of appendices is an unpublished source (certificates, records, letters, speeches, etc).

Illustrations, plates, maps, tables, engravings, posters, graphs, etc, might also be added to the master's thesis in appendix. In general, the following argumentation applies:

- when they are an illustration of certain text parts, place them in the body of the work as close to the accompanying text part as possible
- when they should be consulted throughout the text, they can added in appendix. Place them in a way that they can be easily consulted while reading the text, for example unfolded or removable from the thesis envelope or in extremis in a separate volume.

All appendices should be numbered and given a title.

Design portfolio (for Architectural Engineering)

The goal of the portfolio is to illustrate the design project. As a result, this document should consist of a wide range of images and (technical) drawings. The list of required drawings will be provided by the design supervisor. Although the document typically consists of a lot of graphical material, it should be supported with a sufficient amount of text to ensure its clear understanding.

Similar to the scientific part, any graphical material that was not produced by the student himself/herself should have a reference.

4. Handing in the master's thesis

The deadline for handing in the master's thesis is announced every year on the faculty website.

The number of hard copies:

1 for the president

1 for the supervisor

when applicable 1 for the co-supervisor

1 per jury member

1 for the faculty (which will be archived at the university library afterwards)

In addition, an electronic copy of the master's thesis should be handed in at the faculty secretariat.

The copies of the master's thesis are handed in by the student personally to the president, (co-) supervisor, jury members and faculty secretariat. In case of Architectural Engineering the student hands one copy in at the faculty secretariat and the other copies are submitted at the secretariat of the ARCH department.

When you don't hand in your master's thesis on time, you will have to redo it in the second term. The master's thesis should be handed in one week before the opening of the second term. The exact date will be announced on the faculty website.

5. Evaluation of the master's thesis

For the determination of the final mark the manuscript, the oral presentation and the student's progress in terms of scientific and technical content are taken into account plus, for the architectural engineering jury, the design project and the integration. For the specific rules for the evaluation of

and deliberations of the master's thesis we refer to the Examination and Teaching Regulations of VUB and to the supplementary regulations of the Faculty of Engineering. More detailed information can also be provided by the Master's Thesis Jury chairperson(s).

The final mark of the master's thesis is expressed by an integer between 0 and 20.

If part of the manuscript presents evidence of plagiarism, the penalty will be a mark of 0/20.

6. Summary

1. The master's thesis cannot be a copy of theories from books and course books. Only essential aspects for the understanding of the research can be briefly summarized.
2. Pages and illustrations should be numbered correctly. The numbering can be performed by chapter or globally.
3. All illustrations should be clear. Graphs should mention axis titles and units.
4. Measurements should be presented graphically as much as possible. The actual measurement results can be added in appendix when considered necessary. Take care of rounding off number of digits.
5. Don't wait with writing your text until the whole research is finished. As soon as a part of your research is finished, write the results down. Each supervisor/assistant is willing to read through interim texts. This makes it possible to notice and correct possible problems in an early state.

Succes!

The dean
The supervisors