

INSTRUCTIONS FOR WRITING MASTER'S THESIS



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1. OBJECTIVES

1.2. Content objectives

The central objective in the Master's thesis is to gain practical advantage by applying the latest knowledge. The thesis has to give significant result to at least one of the organizations.

The following points are taken into consideration to evaluate the success of the thesis:

- Finding and defining a research topic
- Clear structure and focus of the work as well as analytical grip
- Choice and command of research and planning methods
- Forming a concrete research combination
- Originality and coherence of the research

The thesis should bring something new to the field:

- Clear up phenomena or dependencies between them
- Develop a new idea, proposition, procedure or model
- Verify earlier theories and define the competence area from the new observational data
- Develop economical, operational, technical and structural solutions
- Estimate credibility of the research process

1.3 Educational objectives

Master's thesis is an indication of maturity. The student is to show her/his readiness particularly for independent creative activity. In the thesis should be acquired and applied latest scientific research results. However there must be tight communication between the student, supervisor, instructor and other interested students. The thesis can also be elaborated as a group work of two or more students.

2. DEFINING THE THESIS AND APPROVING THE TOPIC

2.1 Definition of task and headline

The problem area of the Master's thesis is defined and the purpose cleared up exactly enough already before commencing the work. Simultaneously the basis and objectives for the work are brought out. The headline has to be short and clear but sufficiently informative. It has to express clearly the topic of the work i.e. what has been researched.

2.2 Research plan

Following points are defined in the research plan:

- Clear up the background, motivation, theoretical basis and research problems
- Objective for the work (main objective, contributing objectives)
- Research and planning methods
- Timetable and possible budget
- Structure of work: background, research problem, objectives, research methods, theoretical and empirical examination, analysis, synthesis and conclusions

2.3 Time limit

The time limit for finishing the Master's thesis is maximum one year from granting the topic. If the thesis is not presented for review by the deadline, the topic becomes void and the student has to apply for the topic anew. Exceeding the deadline can lower the grade for the thesis.

2.4 Preliminary notice on commencing the Master's thesis

The Department of Industrial Engineering and Management is developing procedures and resources in the supervision of the Master's theses. The most pivotal objective is to improve the quality of supervision and instruction. The objective is to promote internal cooperation between the professors of the Department as well as to prevent confining specialization as the number of professorships grows, and to guarantee sufficient resources and the right expertise for supervision of every Master's thesis. Each student writing a Master's thesis in the Department of Industrial Engineering and Management fills in a pre-notification form. The notification form is to be left in the Secretariat of the Department, which takes the forms for the professors/supervisors to process. The student is informed about the decision. Spring 1999 is piloting time, and the process will be launched of full weight in the beginning of the next academic year. The form can be found at WWW address

2.5. Applying for the topic

Topic for the Master's thesis can be applied for when at least 140 credits have been passed (incl. practical training and I part of the degree). Application forms for the topic can be acquired from the study office and WWW pages <http://www.tuta.hut.fi/>. A study transcript has to be asked from the study office to be attached to the topic application form. The study achievements are grouped in the study transcript (Nota bene: also studies, which do not belong to the degree but still are to be taken, are marked down). Studies are grouped according to the Study Program (it is to be marked down also, according to which year's Study Program studies have been passed), or according to the applications if individual major or minor subjects have been applied.

The topic for the Master's thesis is granted by the Head of Department. Decision days of the Head of Department take place once a month; timetable can be acquired from the Secretariat or Reception. A copy on the decision is sent home to the student. The topic of the Master's thesis is valid for one year starting from the day it is approved.

Names of any companies cannot be mentioned in the topic of the Master's thesis. A translation of the topic both in English and in Finnish has to be always attached to the application. The topic is agreed upon together with the supervising professor (professor of the major subject), and professor's recommendation is attached to the application. The topic for the Master's thesis has to be chosen so that it is connected with the professional task field of the major subject. If the Master's thesis is done for the minor subject, signatures for the topic application are needed from the professors of both the major and the minor subject.

Small specifications can be done to the topic even after granting it, but if the topic changes essentially, it has to be applied anew. Both specifications and alterations have to be agreed upon with the supervisor.

2.6 Supervisor and instructor

Instructor and supervisor are approved at the same time as the topic for the work. Announce all the required information on the instructor and supervisor as accurately as possible. The Master's thesis is normally done under the supervision of the teacher (professor) of the major subject. On the basis of this teacher's proposition the work can also be done under the supervision of a HUT's research professor or a scientist on

leave from the professor's post, or for a special reason under supervision of a Senior Lecturer (Docent). The closest foreman usually acts as the instructor for the work at the company where the Master's thesis is being done.

3. MASTER'S THESIS AS PART OF DEGREE

3.1 Master's thesis in the degree

Master's thesis belongs to the advanced studies and it comprises of 30 credits. The objectives of the Master's thesis are:

- Give preparedness to acquire scientific knowledge independently and to identify, analyze and solve scientific and professional problems in new situations, too, and otherwise apply scientific knowledge in practice
- Give advanced knowledge of the theories, research, problem solving and planning methods pivotal to the studies
- Give profound information on the problem entirety subject to the studies

3.2 Verifying the degree structure

~~The structure of the degree is verified preliminarily in the Secretariat in connection with applying for the topic; hence the application papers for the topic have to be filled in carefully. It is good to let the structure be checked at this point so that possible obscurities are noted in time. Feedback on verification of the degree structure can be gained via electronic mail.~~

~~Optional studies can be included either to other studies or studies outside the degree. Studies included in other studies are part of the whole degree and consequently counted in the average grade, too. As supplementary studies can be included studies, which surpass the minimum of the degree, i.e. 180 credits. Studies valid for postgraduate studies and which can be included in the postgraduate degree have to be grouped in additional studies (studies outside the degree).~~

4. WRITING

After drafting the work plan, performing the work has to be negotiated with the supervisor of the work or the person ordered by her/him. At the same time, the source books can be discussed. Negotiations can also be arranged at other phases of the work.

It is advisable to take notes in the negotiations with the supervisor and instructor and other experts as well as from articles and other literature references, since it may be difficult to remember or get grip on them later on.

After finishing other parts of the work according to the approved work plan, the results are presented and analyzed with the supervisor and the instructor. At this phase the work is considered as a whole so that all points of view are be taken into consideration.

4.1 Collecting source books

Proceeding the actual beginning of the Master's thesis, needed literature is collected and listed in a catalogue. It is good to get sufficiently acquainted with the source books

in the beginning so as to find quickly the aiding information and quoted passages needed.

4.2 Written presentation

Master's thesis is usually written in Finnish, Swedish or English or in some other language approved by the Department on the basis of the student's application. In Finnish and Swedish language studies the student has to demonstrate such command of both languages as required for practicing and developing the profession as a civil servant with an academic degree positioned in a bilingual area. Previously mentioned perfect command of language is manifested by writing the Maturity test with the mother tongue the student has acquired her/his education in Finland. Command of the other native language is demonstrated with a language test.

Detailed information on writing a clear and systematic Master's thesis is available e.g. in the following literature:

Kauranen, Ilkka & Aaltonen, Mika & Naumanen, Mika & Kaila, Martti. M. A Guidebook for Writers of Research Papers in Industrial Management. Otaniemi: Helsinki University of Technology, Institute of Industrial Management, 1992. 70 s. (Institute of Industrial Management 1992/1). ISSN 0789-5216. ISBN.951-22-1149-1.

More information on the course can be obtained from the Language Center. The Language Center also offers service in reading the abstracts for the students writing Master's thesis.

4.2.1 Title page

Annex 1 presents an example of the text in the title page.

4.2.2 Abstract

The abstract is a short, informative description of the objectives, research methods, gained results and conclusions of the research on one page. The abstract is attached to the Master's thesis and a copy of it is delivered to the Secretariat of the Department, from where it is delivered to the Main Library and the Spokesman of Helsinki University of Technology. In the Main Library the information is coded to the Tenttu database. The abstract is written both in English and with the language the Master's thesis has been written. The abstract has to be submitted to the Language Center for a language check (See Appendix 2).

4.2.3 Preface

In the preface are presented the background of the work, share of the supervisor and instructor in the work as well as gratitude to the persons, institutions, financiers etc. contributing to the completion of the work. After preface comes the name of the author and date with precision of one month (e.g. Espoo, August 1992).

4.2.4 Table of contents

The table of contents is done after the writing job is finished. It is drafted systematic and it is collected all chapters of the writing with sub-headings and page numbers. The table of contents is composed in form of decimal division so that division to more than three levels can be avoided. In connection with it, a list of appendices is presented and

according to consideration, a list of pictures, maps and charts presented in connection with the text.

4.2.5 Explanations for abbreviations, signs and terms

The Master's thesis can include signs, symbols, abbreviations and terms, which need explanation. Manners of representation for abbreviations etc. can be checked from different writing guides.

4.2.6 Introduction

The introduction comprises shortly of the starting point, problem field, definition of the research area and clear definition of the purpose of the work. It also describes with the aid of literature the theory and grounds, which are essentially connected to the work. Other research reports are described only to the extent that is needed to understand or clear up the work. The introduction does not describe the research itself nor results but it or a separate chapter can clear up the concepts used in the research. If needed, the introduction can be divided with sub-headings into appropriate chapters clarifying the content of the Master's thesis.

4.2.7 Summary

In the summary the purpose, main content, results, conclusions and recommendations of the work are presented shortly and clearly.

4.2.8 Bibliography

As a rule the reference has to be used elsewhere than in seeking for own interpretations and conclusions or so called universally applicable knowledge. References have to be used e.g. in presenting results, theses, etc. of some other researcher or of a table or picture borrowed from another publication. A direct quote is marked with quotation marks. References have to be focused to the source as original as possible and not to a later publication, in which the mentioned source has been utilized. A common and widely used model is so called Harvard system. More accurate information on composing the index can be checked from the writing guides.

4.2.9 Appendices

Appendices are numbered and placed at the end of the Master's thesis. It has to be considered carefully, what to present in the appendices. As appendix can be presented a description of the used methods, detailed results, pictures of inconvenient size, maps, questionnaires etc.

4.3 Layout and form of Master's thesis

The layout of the Master's thesis has to be neat, tidy and representative. The Master's thesis is bound in size A4. For bounding purpose there has to be a wide enough margin on the left side of the paper. If drawings, maps or computer prints form an essential part of the work, they or the copies of them have to be folded in a separate folder size of the Master's thesis.

Perspicuity of the Master's thesis can be increased by using suitable pictures and tables in addition to the text.

The Master's thesis has to be bound in black covers. On the front cover is written the text "Diplomityö" (Master's thesis in Finnish) and bottom right the name of the author. On the spine there has to be the name of the author and the year. The name of the author is printed starting from 50 mm from the top and the year ending 15 mm from the bottom. Model for the layout can be checked from the Master's theses available in the library of the Department of Industrial Engineering and Management. See yellow pages of the telephone book for printing houses.

5. MATURITY TEST

The student writing a Master's thesis has to write a Maturity test to demonstrate both the command of the content of the Master's thesis as well as the language with which the student has acquired her/his education. The Maturity test has to be taken before applying for the degree certificate

The foreign student has to write the Maturity test, too, usually in English, which is checked by the supervising professor.

The Maturity test is to a considerable extent similar to the creative writing part of the Mother tongue test in the written examination for the higher certificate. The length of the Maturity test is usually 4 pages. The grading scale for the test is pass or rejected. The test can be renewed. Evaluation of the Maturity test takes 1–2 weeks, after which the achievement is taken to the Study Register.

5.1 Linguistic form

The Maturity test has to have a clear title but no sub-headings. The Maturity test is written in clear and neat penmanship. Remember margins and division into paragraphs. Pictures and graphs may not be used unless it is quite essential. Directories do not belong to the Maturity test either. Bear in mind the spelling rules!

6. APPROVAL OF MASTER'S THESIS AND ACQUIRING DEGREE CERTIFICATE

6.1 Approving Master's thesis as a separate study achievement

See: <https://into.aalto.fi/display/entuo/Master%27s+thesis>

6.2 Approving the Master's thesis and the degree

See: <https://into.aalto.fi/display/entuo/Master%27s+thesis>

6.3 Reviewing Master's thesis

See: <https://into.aalto.fi/display/entuo/Master%27s+thesis>

6.5 Awarding the certificate

See: <https://into.aalto.fi/display/entuo/Master%27s+thesis>
and <https://into.aalto.fi/display/entuo/Graduation>

6.6 Scholarship for quick graduation

Preconditions for getting a scholarship are:

- Graduation time no more than 4 years

- The weighted average grade of the studies has to be at least 3.5

For specific reasons (short graduation time or high average grade) the scholarship can be granted even though not both conditions are fulfilled. Scholarship cannot be granted for students who have graduated as Bachelor of Science (Tech) or building architect at a polytechnic nor students accepted as a special case. Scholarship forms can be acquired from the Secretariat of the Department, where they are also returned to. The scholarships are given out in connection with the event of awarding the Master of Science (Tech) certificates.

7. FINANCING MASTER'S THESIS

7.1 Master's thesis as a salaried employee

It is very common to finance the Master's thesis by working in a company and write the thesis on the spot as a paid employee of the company. In the same manner one can work e.g. in a research project.

8 COPYRIGHT

8.1 Publicity and copyright issues of a Master's thesis

Master's thesis is a public demonstration, which has to be on view at the Department. One copy is placed in the Department's library. As to the copyright of the Master's thesis, the general copyright legislation is followed. In case an invention is produced in connection with the Master's thesis, general regulations of the patent legislation are observed. Master's thesis is a public document, to which concealment regulations do not apply in most cases. The thesis may include information on business or professional secrets, inventions apt for patenting etc. If certain information is to be excluded from the document publicity, such information cannot be included in the thesis in the first place.

9. Contact information

TU-22 Industrial Management, Office Secretary Pirjo Ruuskanen, tel. +358 9 451 3641

TU-53 Work Psychology and Leadership, your professor, tel. +358 9 451 3651

TU-91 Strategy and International Business, Office Secretary Maria Tikka, tel +358 9 451 3090

Mailing address: PO Box 5500, FIN-02015 HUT

Visiting address: Otaniementie 17

TU-117 Development and Management in Industry, Office Secretary Tuula Nokkanen, tel. +358 3 525 0216, HUT, Lahti Center, Saimaankatu 11, 01540 Lahti

Mailing address: PO Box 5500, FIN-02 15 HUT

Visiting address: Otaniementie 17

firstname.familyname@hut.fi

10. Literature

Kauranen, Ilkka & Aaltonen, Mika & Naumanen, Mika & Kaila, Martti. M. A Guidebook for Writers of Research Papers in Industrial Management. Otaniemi: Helsinki University

of Technology, Institute of Industrial Management, 1992. 70 s. (Institute of Industrial Management 1992/1). ISSN 0789-5216. ISBN.951-22-1149-1.

APPENDICES

Appendix 2: Abstracts of Master's theses

Write directly in English; do not translate your original version. One way is to read one paragraph at a time of the original and then try to write its main ideas in English.

Aim to write a text which is SHORT, SIMPLE and CLEAR.

Your abstract should tell us

- the purpose of the work
- what you did and how
- what you achieved and its significance.

Before sending in your abstract, check the following:

- your title is informative and clear
- you have written qualifications AFTER people's names,
e.g. Matti Nimi, M.Sc.,
or John Surname, Lic. Tech.,
or Jane Family-Name, Dr. Tech.
- the spelling is correct (choose British or American style)

SEND YOUR ABSTRACT - BOTH IN ENGLISH AND FINNISH -

with your NAME, email address, DEGREE PROGRAMME and STUDENT NUMBER

to ELIZABETH HEAP-TALVELA, 1100 HUT (liz.heap-talvela@hut.fi)