



TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY



Eesti Kunstiakadeemia

A GENERAL GUIDE TO WRITING AND DEFENDING MASTER'S THESIS

MADM – Design and Engineering

Tallinn 2013

TABLE OF CONTENTS

1	INTRODUCTION.....	3
1.	WRITING A PAPER	3
1.1	Cooperation with supervisor.....	3
1.2	Topic of Master`s Thesis	4
1.3	Requirements to Master's Thesis.....	4
2	TECHNICAL REQUIREMENTS FOR MASTER`S THESIS	5
2.1	Language of the paper	6
3	DEFENCE PROCEDURE	6
3.1	Submitting of the Master`s Theses and applying to defense.....	6
3.2	Reviewing and defending	7
	Annex 1.....	9
	MASTER'S DEFENSE Application.....	9
	Annex 2.....	10
	Master's Thesis task	10
	Annex 3.....	12
	Annex 4.....	13
4	Author's Declaration.....	13

1 INTRODUCTION

This guide is to help students prepare the research and graduation papers of Master's Thesis of Design and Engineering specialty joint curriculum of Tallinn University of Technology (TUT) and Estonian Academy of Arts (EAA). The Guide provides the requirements set by EN and ISO standards, TUT & EAA regulations for these papers, which are obligatory for all research papers, bachelor's and master's thesis.

Master's Thesis is a research, development or application paper written independently and personally under the guidance of a supervisor, in which the author in a comprehensive manner discusses analyses and solves a topical theoretical or practical problem. A successful Master's Thesis shall be based on the knowledge acquired during general, basic and core studies. Master's Thesis should present the maturity of the graduate in the context of the usage of the knowledge acquired during the studies. Research problem is selected according to the specialization and agreed with supervisor and confirmed with the Head of the Program.

After completing the Master's thesis and defending it successfully, a student will prove his/ her:

- experience and skills of conducting academic research and development (R&D) work, that corresponds to international level of selected research topics;
- ability to use scientific literature and other informational materials needed for solving specific problems of selected research topics;
- depth of knowledge in the fields of selected research topics.

1. WRITING A PAPER

1.1 Cooperation with supervisor

The Master's Thesis shall be written under the guidance of a supervisor. Students can choose a supervisor themselves Supervisor may be:

- a faculty member of TUT or EAA, who has at least Master's degree,
- a PhD student of TUT or EAA,
- a person with higher or equivalent qualification to the academic degree awarded to the student.

If necessary, two supervisors can be assigned representing different approaches to the subject, for example from fields of Design and Technology, or Business and Engineering. In case of two supervisors, one of them has to represent TUT or EAA.

Supervisor is neither a co-author nor editor of the Master Thesis. The student alone is responsible for the scientific quality, language grammar and formatting of the Master Thesis. Supervisor provides guidance and advice on formulating the topic, defining the problem, setting aims, guiding the design work and approach and organising the paper. The supervisor points out the mistakes and deficiencies, strengths and weaknesses, evaluate the use of terminology, thesis style and language. The student is obligated to contact the supervisor regularly and inform him/ her about the progress of work, problems, possible changes, etc.

1.2 Topic of Master`s Thesis

The student selects the topic independently. The supervisor could help to find a suitable topic. There are several ways to find the topic, for example:

- the topic from an interested company. Co-supervisor from the enterprise has to be appointed and his name should be fixed on the reverse side of the title page;
- the topic is from the list of available topics from TUT or EAA;
- the topic is related to some current/finished research or development work from TUT or EAA;
- appropriate topic is chosen by student.

After the topic is selected and agreed with the Head of the Program and supervisor, student fills Master's Thesis task form (Annex 2), which will be later bind with Master's Thesis. Master's thesis topic and a supervisor should be selected and accepted during the first half of third semester.

1.3 Requirements to Master's Thesis

The subject of the Master`s Thesis should be actual, come from practical necessity or from the field of research and development. Master`s Thesis should be focused on product design, creative product development, general engineering problems, or should be connected to the research work of these fields.

Master`s thesis should have at least two topics from the following list covered:

- product design part (product design research objectives, like design management, sustainable design, design research and innovation, user centric design, etc.),
- industrial engineering part (engineering research objectives, like product development, engineering design, concurrent engineering, product lifecycle management, mathematics, modelling and simulation of products, etc.),
- engineering information presentation part (techniques, like schemas, drawings, tables, and others),
- design visualisation part (design skills for doing prototype or mock-up model, 3D renderings, drawings and sketches),

- management part (economic aspects, like marketing, managerial accounting, operations management, business logistics, organisational behaviour, etc.).

These parts should be integrated and form a single research work with logically represented structure, which demonstrates authors` ability and skills to handle research work in several research fields simultaneously on high level and to achieve expected results.

Master's Thesis must be an independent exploration, development-oriented or any other creative work, which includes problem definition, analysis of the problem area, and a design of corresponding solution or a theoretical study on a chosen field. Master's Thesis must demonstrate the level of author's maturity of the knowledge derived from study of research problem, ability to use creative, scientific, technical and economic innovative problem solving methods.

2 TECHNICAL REQUIREMENTS FOR MASTER`S THESIS

Master's Thesis consists of the explanatory part (minimum of 60 pages of A4, 100000 – 140000 characters with no spaces), graphical part (drawings, schemas, illustrations) and appendixes.

Explanatory part of Master's Thesis must include:

- INTRODUCTION
 - problem definition and scope: reflection on the current research, development necessity and feasibility. Also novelty compared to existing solutions or methods, object description exploration, and description of general problem-solving methods under consideration;
- CONTENT
 - clearly defined work objectives (goals) and tasks solved (3-4 tasks);
 - structure of the document must be logical and easily understandable;
 - should include the use of contemporary design and engineering methods and theories typical for the field;
 - description of the work done and results obtained in the analysis phase (quantitative and /or qualitative assessment of the results of the work);
 - contribution of the author must be clearly identifiable;
- SUMMARY of the main results, their importance and remained unsolved opportunities.
- REFERENCES
 - minimum of 10 references. All references should be indicated in main text. It is recommended to use latest/ modern sources of information and bibliography. It is recommended that at least half of references are not older than five years.

Web based references should include date of use. Author is responsible to archive used web materials, in case later used links are not active, the referred materials can be proved either from digital copy or paper printout copy.

Chapters of the work must be submitted to their logical sequence, and they must include characteristics of modern theories/methodologies. In Engineering targeted Thesis the student must demonstrate skills to use Mathematics, ICT, Data Analysis (including the processing of experimental data), etc. where necessary. The review part of research should include a comparative analysis of the potential alternative solutions, providing either a quantitative (engineering or economic-based) or qualitative assessment of the work of the proposed solutions. Each chapter must end with the conclusions.

2.1 Language of the paper

As a rule, the papers are written in English. The papers must be grammatically correct. It is recommended to pay attention to:

- spelling,
- capitalisation,
- abbreviation,
- numerical expressions,
- punctuation.

3 DEFENCE PROCEDURE

3.1 Submitting of the Master`s Theses and applying to defence

Fulfillment of all requirements of the curriculum is a prerequisite for submission of master's thesis for defence. A graduate wishing to defend the thesis shall:

1. Prepare an application and submit the application form – Annex 1 signed by the supervisor to the Dean's Office before the deadline given in TUT academic calendar.
2. The deanery issues of the certificate of student's educational credits should be settled not later than 3 days before the date of defence session to verify that there are no formal barriers for the defence session.
3. Completed work shall be submitted to supervisor for review at least 2 weeks before defence date.
4. The reverse side of title page (Annex 3) contains author's declarations to be filled by the applicant (Annex 4).
5. The Master Thesis, signed by student and supervisor, has to be submitted to chairman of defence commission not later than 10 days prior to the defence session. Chairman of defence commission will decide to accept the work for defence session or reject within one week.

6. The supervisor may make a proposal to arrange the preliminary defence session, which must take place at least 10 days before the defence commission. The arrangement form of preliminary defence procedure is established by the Head of the Department.
 7. If the work meets the requirements for final papers, supervisor together with the Chairman of defence commission recommends a reviewer no later than 10 days before the defence session date. The reviewer must have the same or an equivalent academic degree of MSc.
 8. The student presents Master's Thesis with the "reviewer reminder", which is available from secretary of department, to the reviewer. Errors and deficiencies, indicated by the reviewer are not allowed to be corrected and improved before defence.
 9. Reviewer opinion must be available to applicant and members of defence commission at least 2 days before the date of the defence.
 10. The supervisor writes an opinion on Master's Thesis, where he/ she evaluate the work done by applicant, his/her ability and initiative to solve independently engineering problems and skills to present obtained results. The opinion is not public and supervisor has to give it to secretary of Department (where defence will be arranged) one day before the defence commission session date.
 11. The supervisor, Head of the Curriculum shall sign the reverse side of the title page confirming the graduation paper is eligible to defence. If the paper does not conform to the requisite level, the above named persons have the right to refuse from accepting the paper to defence.
 12. Student has to give 2 copies of binded Master's Thesis and its electronic version on the CD in PDF format to secretary of department not later than 2 days before the proposed defence date. The presentation has to be prepared on the CD or memory stick in PPT or PDF formats.
 13. The need of technical equipment for defence should be agreed with secretary before the defence procedure.
 14. The paper-outs, the drawings and posters, which are larger than A3 size, should not be folded before the defence session.
- The defence session is arranged as a public academic discussion, the time and place of the session shall be announced by the faculty advertisement notice at least 2 weeks prior to defence session date.
 - The defence session will take place when the applicant and at least 4 members of 5 from the commission including the chairman are present.
 - The working language is English. Exceptions are agreed beforehand.
 - In special cases the chairman can arrange closed type of defence session with registered participants.
 -

3.2 Reviewing and defending

Graduation papers are graded on the basis of the TUT grading scale (5 – excellent, 4 – very good, 3 – good, 2 – fair, 1 – passed, 0 – fail).

Master's Theses are defended twice a year, on dates indicated in the academic calendar of TUT. Graduation papers are defended publicly in front of the defence commission.

The defence commission consists of 5 persons: 2 of them shall have the PhD or corresponding qualification; at least 2 of the commission members should represent the field of Design and 2 the areas of Engineering. At least 3 members of the commission should be from TUT or EAA, at least one member from outside of TUT or EAA, preferably from abroad. Head of the Curriculum should be part of the commission. The supervisor and reviewer can be the members of defence commission without the right to vote on the result of their student.

The main stages of the defence procedure are:

1. the candidate's presentation;
2. listening to review(s) (if a review was required) and answering the questions;
3. general discussion (questions asked by members of the commission and other attending persons);
4. final speech of the candidate.

The defence speech of a Master's Thesis defendant is 15 minutes long. A defence speech must describe the problem, objective, object, methods, conclusions and present the results.

The Master's Theses are evaluated by taking into consideration:

- the paper;
- the design work
- defence speech and answers to the questions
- reviewer's opinion (if required) and supervisor's opinion.

Defense commission decides graduate's academic degrees during the closed meeting after defenses. Decisions and marks of Master's Theses will be notified immediately after the meeting, and shall be final. Master's Theses are graded according to the common grading-scale of TUT. All positive marks denote successful defence. In case of grade "0" the thesis can be defended again under the conditions determined by the chairman of the defence commission.

Annex 1

MASTER'S DEFENSE Application

Attn. Dean of Faculty of Mechanical Engineering

First- Last Names

RE student / REV student / external student

delete as appropriate

Applicant Code

Curriculum
code

Personal Identification number / date of birth

Address

Contact phone number / e-mail

Please accept my Master's Thesis for defence

.....

Master's Thesis code and topic

.....

.....

.....

topic in English

Request of academic Master of Technical Sciences (M.Sc.) with speciality "Design and Engineering"

.....

date

.....

signature

Supervisor:

name

signature

date

To fill at deanery:

The applicant has passed curriculum of ECTS points in total
with average degree of

and fulfilled with this all of curriculum terms and conditions.

Code

.....

name

signature

date

Annex 2

Master's Thesis task

201... /201... academic year semester

Student: (name, code)

Field of study

Supervisor: (position, name)

Consultant(s):(name, position, phone)

Master's Thesis topic (in Estonian and English languages):

.....
.....
.....
.....

Tasks and timeframe for their completion:

Nr	Task description	Completion date
1		
2		
3		
4		
5		

Design and Engineering problems to be solved:

.....
.....
.....

Defence application submitted to deanery not later than Deadline

Student /signature/ date

Supervisor..... /signature/ date

Phone

E-mail:

Enterprise based confidentiality and other terms to formulate on the reverse side

Annex 3



TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY



Department of

Chair of

Karl Kask

POSITIONING DEVICE

Author applies for degree of Master of Technical Sciences (M.Sc.)

Tallinn 2013

Annex 4

(Reverse side of title page)

4 Author's Declaration

I have written the Master's thesis independently.

All works and major viewpoints of the other authors, data from other sources of literature and elsewhere used for writing this paper have been referenced.

Master's thesis is completed under supervision

“.....”201.....

Author signature

Master's thesis is in accordance with terms and requirements “.....”201.....

Supervisor signature.

Accepted for defence

..... chairman of defence commission

“.....”201... .

..... signature