**GUIDE TO WRITING THESIS**

**FOR ENVIRONMENTAL ENGINEERING MSC STUDENTS**

**(edited by Department of Environmental Engineering, Faculty of Engineering, University of Debrecen, September 2018)**

**INTRODUCTION**

This guide is designed to set the requirements regarding content and format of thesis and assist the candidate (Environmental Engineering MSc students) in successfully writing and submitting it.

1. **GENERAL PRINCIPLES**

Submitting thesis is one of the basic preconditions for taking the state exam. Thesis topics are announced and updated until week 4 in the study period of the final semester. Students are permitted to select a thesis topic which is not included in the list and which relates to the program profile. Selection of the thesis topic should previously be approved in writing by the program coordinator.

For the candidate the purpose of writing thesis is to systemize, solidify and utilise theoretical and practical engineering knowledge, familiarize himself/herself with the research field in depth. Writing thesis is an independent work which involves solving a real engineering task. By submitting thesis the candidate proves that he/she is capable of solving engineering tasks independently. Therefore, thesis must be elaborated and compiled with the greatest carefulness adhering to the specific requirements for content and format.

Thesis topics may be provided by companies, firms or research institutes. A National Scientific Students’ Association Conference (Hungarian abbreviation: “OTDK”) topic might be developed into a thesis topic, as well. Upon the company’s special request content of thesis might become confidential. In this case a so-called confidentiality agreement needs to be concluded.

There is a three-hour practical session (as defined in the curriculum) for graduating students in their final semester. It is recommended that students select a thesis topic at the beginning of their studies. Also, measurements (related to the selected thesis topic) should be undertaken during the summer internship period.

The candidate is supported by an internal supervisor (from the university, having a PhD degree) and the external (industrial) supervisor. *The external supervisor does not necessarily have to have a PhD degree, however, high level of practical knowledge and a Master’s degree in the particular field is a must. The student selects the external supervisor (in an official way in writing) but the department will decide whether the selected person can act as an external supervisor. The external supervisor may not be a close relative which the student acknowledges in writing.*

The ability to prove that thesis is the candidate’s own work is one of the basic preconditions for accepting thesis for submission. The supervisors cannot provide the candidate with the solution of the task but they assist him/her with utilizing the literature read, tutorials and other documentations of the company, pointing out exaggerations, consequences of bad start or wrong calculations, establishing the conditions for independent work.

**Sub-tasks to be solved** are specified by the supervisors. The profoundness of the elaboration and the proportion of the parts are specified by the supervisors. Thesis is considered to be appropriate for submission by the supervisors if it is entirely elaborated and meets the requirements of form and content.

The candidate is required to follow all the university rules (ethical rules, work and fire safety rules, rules set by the external workplace) in force related to writing thesis. Before starting to work at the external workplace the candidate is required to obtain information on the legal regulations related to the task to be performed. Also, he/she is liable for any damage (personal or material) caused.

**Consultations, deadlines:**

In the first semester of the academic year 2018/2019 the document, called Thesis Topic Announcement Form can be modified until 30 September 2018. After the aforementioned deadline modifications are allowed exclusively with the consent of the program coordinator.

Progress with thesis is certified on Thesis Topic Announcement Form and countersigned by the internal and external supervisor. Five consultations should take place in the following manner. Also, sub-tasks should be solved until the below mentioned deadlines:

**Consultation 1-2: until 12 October 2018**

**Consultation 3-4: until 31 October 2018**

**Consultation 5: until 9 November 2018**

If thesis (its quality and quantity) is found to be inappropriate by the supervisors at the time of consultations, the program coordinator and the head of department should be informed about it without delay, as they might make constraints on submitting thesis in the particular semester.

**Thesis is considered to be appropriate for submission if:**

* **student-supervisor consultation was undertaken, progress with thesis was certified on Thesis Topic Announcement Form**
* **the external supervisor (if there is any) agrees with the content of thesis, his/her approval is countersigned on Thesis Topic Announcement Form**
* **thesis is entirely elaborated, acceptable in terms of content and format**

**Thesis (ready for submission, submission previously confirmed by the supervisors) is to be submitted in person to the Department of Environmental Engineering (room 312, Faculty of Engineering) in one bound copy (this copy must include a photo of the candidate) and one electronic copy.**

**Thesis must include an English table of contents and an English summary. Along with submitting thesis the English summary should also be submitted to the state examination board in a separate copy.**

**CD must contain:**

* **Thesis in MS Word and PDF format**
* **Thesis Topic Announcement Form**
* **Colour scan of Supervisor’s Declaration and Plagiarism Statement with original signature**
* **Photo of the student**
* **Colour scan of Confidentiality Agreement (if applicable) with original signature**
* **English table of contents**
* **English summary**

**The documents on CD must contain the document’s title and the student’s name (for e.g. thesis\_topic\_announcement\_form\_X\_Y).**

1. **Structure and length of thesis**

Recommended structure:

* external black cover with gilded letters (see Appendix 1)
* internal cover (see Appendix 2)
* Thesis Topic Announcement Form
* Table of contents (should be page 3)
* if necessary: List of abbreviations, Index (page numbering consecutively)
* Text (elaboration of task/problem)

**obligatory parts of thesis, sequence, thesis material should be organised as follows:**

**Introduction, addressing the problem**

**Overview of the works consulted and cited**

**Material and method**

**Results and their evaluation**

**Summary**

* References
* Appendices

Table of contents

Abstract

* Plagiarism Declaration (the student declares that thesis is his/her own work, he/she has identified all material in this thesis through appropriate referencing, where he/she has quoted the work of others, he/she has included the source, see appendix 3)
* Supervisor’s Declaration (the supervisor declares that thesis is ready for submission and work carried out in thesis is in accordance with the requirements of university rules)
* photo of the student (on the internal cover of thesis, in the middle of the page)
* back page of the cover
1. **Layout of thesis**

The layout of thesis has to be aesthetic and reflect a uniform appearance. Therefore, the following formal specifications have to be followed.

Thesis material should be organized as follows:

* **Introduction, addressing the task/problem:** deals with the theoretical and practical importance of the topic, justifies investigations and goals (2-3 pages). Clearly defines general goals of the investigations and detailed goals are formulated in 3-5 declarative sentences (I investigated, I evaluated, I defined).
* **Overview of the literature consulted:** detailed, systematic survey of the literature consulted, which aims to show the candidate’s proficiency. Min. number of entries: 25-30. 1/3 of the sources should refer to Hungarian or foreign authors.

The following documents should not be referenced: legal regulations, standard collections, newspaper article, not peer-reviewed conference proceedings, abstract. References to online publications should not exceed 20% of the sources. Exceptions: Open Access scientific articles or On-Line peer-reviewed scientific articles. Expected literature: peer-reviewed scientific publications. After each chapter the candidate is supposed to make critical observations related to the particular source. The candidate is required to define contradictions contained in the literature consulted and find out whether the goals set in thesis will lead to the solutions. Results in the literature consulted should be analysed and assessed which should take no longer than 15-20 % of thesis. Mode of referencing will be elaborated below.

* **Material and method:** Materials and methods related to experiments, monographic analyses, the methods of experimentation, circumstances of the investigation, modes of the analysis have to be described. This chapter should be written according to the goals previously set. In case of experimental measurements the reproducibility of the description is a must. Mandatory part of this chapter (in case of measurements): defining applied statistical procedures, failure, correlation values. This chapter should not exceed 10-15% of the full length.
* **Results and their evaluation:** This chapter includes the results of investigation and their analyses. This chapter should be written according to the goals (in that sequence) set previously. The results should be summarized in charts, illustrated with images and their reliability should be verified (taking into account the scientific characteristics of the particular field) with mathematical-statistical methods. The candidate is required to fix his/her results precisely and clearly. Also, these results should be explained and compared with other results. This chapter should make up 40-50% of the entire length.
* **Conclusions and suggestions:** This chapter should include the most essential conclusions drawn from the results. Suggestions should be made for their practical applications and further development. This chapter can be unified with the previous one. This chapter should be 2-3 pages long.
* **Summary:** This chapter should not be longer than 3 pages. It should be briefly described under which circumstances the investigations have been conducted, which questions arouse, to what extent the general goals have been reached. All the crucial results (if possible in quantitative terms), statements and conclusions drawn should be mentioned. This should be formulated in a brief and clear manner.

Text and figures in the text

The text is supposed to start with the Table of contents. The Table of contents (on a separate page) is followed by the List of abbreviations and symbols. The main text should start with an introduction that briefly and clearly outlines the topic of your work and the survey of the specialized literature. The candidate has to prove his/her proficiency in the topic.

The text should be concise, clear and contain correct technical terms. It should be divided into chapters. Chapters, sections and sub-divisions should be marked with decimal digits. **The paper format should be DIN A4 (white paper) with 3 cm page margin on the left, 2,5 cm page margin at the top, bottom and side to allow printing and binding. Text should be written in MS Word, Times New Roman 12, 1,5 line spacing.**

The text may be enriched by formulas, diagrams, figures, charts, maps, color pictures. Their size should not exceed half or three quarter of the paper (A4). Illustrations, charts which exceed the aforementioned limit should be placed in the appendix.

* Formulas should be placed 3 cm from the margin which (if there are several) should be numbered at the end of the line between round brackets. Elements of the formula should be explained.
* Diagrams should be placed in the middle of the page. Below serial number, title and referencing (source!) should be indicated. Photos or parts scanned from brochures can be used.
* Numbers and captions appear above the charts. Charts should have a title and if necessary they should be referenced properly.
* Charts, diagrams should be referenced in the text.
* SI (Systéme International d’Unités) should be applied when measuring and referring to physical quantities.

Any source of information should be referenced appropriately (the List of references should include sources which the candidate consulted or for which the candidate referred in the text).

Numbering should be designated in square brackets: [4] The numbers referenced throughout the text should be equivalent to the numbers indicated in the List of references. Numbering (of references and tables) should be in Arabic numerals.

The List of References is required to include an overview of the national literature. Apart from utilizing the national literature, the candidate is supposed to rely on foreign sources, as well.

It is recommended to provide min. 25-30 sources in order of decreasing importance:

* peer-reviewed impact factor journal (national)
* peer-reviewed journal with no impact factor (national)
* peer-reviewed impact factor journal (international)
* peer-reviewed journal with no impact factor (international)
* peer-reviewed book or book chapter
* peer-reviewed summary report

**Sources other than these should be mentioned separately.**

Other sources:

* statistical data sources
* legal regulations
* standards
* patents
* online sources: date on which the resource or website was accessed should be indicated

Numbering in square brackets should be continuous and should start with 1. The sources should follow an alphabetical order. The name of each author should be indicated.

**Template:**

1, Kovács, T., Szabó, M. (2012) Környezetmérnöki MSc formai követelményei. Mérnöki Szaklap. 52:3. 122-240.

2, Palotás Z., Szabó, K. Timár, F. (2005) Szakdolgozat készítés. Kiadó: Debreceni Egyetem. 234-276.

Online source:

I1, Intergeo konferencia összefoglaló 2012.10.21.: <http://www.intergeo.de/en/index.html>

An entry in the List of references is supposed to follow this order: family name of the author, first name of the author or his/her initial, title and publisher of the book, date of publication. If sources based on the original work of another author(s) do not appear in the List of references and the author’s name (authors’ names) is not/are not referenced in the text, this can be considered a plagiarism and in a serious case ethical procedure can be initiated. A somewhat similar case, if the author’s name appears only in the List of references but not in the text.

Journals should be referenced in the following manner: author, title of journal, date of publication, volume number, page numbers. Thesis cannot include any reference to activities of commercial marketing (for e.g. brands, products, services) except the aim of the investigation is especially related to marketing activity.

1. **State exam**

State exam on Environmental Engineering MSc is conducted according to the traditions of engineering education.

A pre-degree certificate is issued by the Faculty after completion of the master’s (MSc) program. The pre-degree certificate can be issued if the student has successfully completed the study and exam requirements as set out in the curriculum, the requirements relating to Physical Education as set out in Section 10 in Rules and Regulations, internship (mandatory) – with the exception of having submitted thesis – and gained the necessary credit points (120). The pre-degree certificate verifies (without any mention of assessment or grades) that the student has fulfilled all the necessary study and exam requirements defined in the curriculum and the requirements for Physical Education. Students who obtained the pre-degree certificate can submit thesis and take the state exam.

Thesis is the creative elaboration of a professional task (scientific, engineering, design, development, research or research development) in written form as defined in the requirements of the training program. By solving the task the student relies on his/her studies using national and international literature under the guidance of an internal and external supervisor. By solving the task the student relies on his/her studies using national and international literature under the guidance of an internal and external supervisor. By submitting and defending thesis students who complete the Environmental Engineering Master’s program prove that they are capable of the practical applications of the acquired skills, summarizing the work done and its results in a professional way, creatively solving the tasks related to the topic and doing individual professional work.

Precondition for taking the state exam for MSc students is to submit thesis. Requirements of the training program contain the content requirements for thesis, general aspects of the evaluation and the number of credits assigned to thesis (30).

The latest that thesis topics are announced by the departments is the end of Week 4 of the study period of the last but one semester.

The aim of “Guide to Writing Thesis” is to assist students with writing thesis. The guide is downloadable from the faculty homepage. Thesis topic can be suggested by the student. The head of department decides on the acceptance of the topic. The conditions on the acceptance of thesis developed into National Conference of Scientific Students’ Association (hereinafter NCSSA) topic are specified by the Faculty. The NCSSA work is supposed to meet the requirements in form and content for thesis. Furthermore, it is necessary that the committee of the Pre-NCSSA makes suggestions on the NCSSA work to be developed into thesis.

Formal requirements of thesis are announced in writing by the Faculty Education Committee.

Thesis is prepared under the guidance of an internal supervisor (previously approved by the department) and with the assistance of an external supervisor (previously approved by the department). The faculty academic calendar (issued by the Vice-Rector for Education) sets the thesis submission deadline, for want of this the deadline is the 21. day 12.00 noon before the first day of the state exam.

Thesis is evaluated by a reviewer (internal). On the basis of the thesis review report the head of department makes suggestions for the evaluation of thesis. Finally, the committee assesses thesis in a five-point system. If thesis has been unequivocally assessed with a fail by the reviewer, then the candidate is not allowed to take the state exam and is supposed to write a new thesis. The candidate has to be notified of the decision. Conditions on resubmitting thesis are defined by the program coordinator (or coordinator of the specialization).

***The state exam***

Students having obtained the pre-degree certificate will finish their studies on the Environmental Engineering Master’s (MSc) program by taking the state exam. State exam means the testing and evaluating of the knowledge (skills) necessary to obtain higher education qualification. In the state exam candidates prove that they can apply the acquired knowledge. Requirements of the training program contain the preconditions on taking the state exam and the procedure of the state exam itself. State exam can be taken in the first state exam period after the award of the pre-degree certificate. State exam is conducted in front of a state examination committee. If the candidate fails to take the state exam until the termination of his/her student status, he/she is allowed to take the state exam after the termination of his/her student status according to the regulations (in relation to state exams) which applied when the candidate was permitted to take the state exam for the first time.

**State exam consists of three parts (as defined in the curriculum):**

1.    Core material of the state exam which includes assessment of environmental condition and the solutions of technological knowledge.
2.    Field-specific knowledge on the basis of the topics of the specialization selected by the candidate. These topics have been strongly integrated into the workshops assigned to the MSc training programme ensuring the elaboration of realistic engineering tasks.
3.    Thesis defence on the basis of an oral exam.

State exam on Environmental Engineering MSc is conducted according to the traditions of engineering education.

**State exam process**

a)    Requirements of thesis and the number of credit points assigned to thesis: **30 credit points**
b)    Preconditions on taking the state exam:

* completing all the subjects in the model curriculum (from semester 1 to semester 4), obtaining at least 120 credits including other subjects necessary for graduation (Physical Education: 1 semester, Work and Fire Safety course)
* completing internship (minimum of 4 weeks),
* preparing and submitting thesis.

c)    state exam (oral exam):

* subjects:

**The core material of the final exam (A):**

* Environmental State Assessment, Auditing
* Environmental Operations III

**Filed-specific knowledge (B, depending on the selected specialization):**

* **B1**: Built Environment
* **B2**: Environmental Technology, Planning and Construction

**Thesis defence (D)**

**Calculation of state exam grade (SE):**
**SE= (A+B+D)/3**

The latest that the requirements of the state exam, state exam topics along with references are announced by the department is the last week of the study period.

The oral exam is evaluated on a five-point scale by the members of the committee. Final grade for the state exam will be decided on in a closed sitting. In case of equal votes the committee chair will decide. Final exam results will be announced by the committee chair. A note of the final exam will be taken. The candidate who obtained the best final exam grade will be awarded the Diploma Prize for Environmental Protection which is conferred in the closing ceremony of the state exam.

***Improving failed state exam***If any parts of the state exam is evaluated with a fail mark - according to Rules and Regulations of the University -, it can be retaken. The ensuing state exam period is the soonest that the re-sit is allowed. If thesis has been unequivocally assessed with a fail by the reviewers, then the candidate is not allowed to take the state exam and is supposed to prepare a new thesis. A retake state exam is allowed twice in each part.

***State examination committee***

Committee chair is called upon and mandated by the dean with the consent of the Faculty Council. He/she is selected from the acknowledged and well-known external experts of the professional field. By tradition, in case of the chair’s disposition the co-chair is called upon. The state exam committee consists of – besides the chairman – at least two members and a definite number of examiners (university professor or associate professor). The mandate of the state exam committee is limited to a year. Students are allocated to different examination committees by the department.

***The degree certificate***

Within 30 days of the successful state exam the diploma is issued and given out by the Faculty at the graduand’s special request. Otherwise, the diploma will be awarded to him/her at the graduation ceremony of the Faculty.
The diploma is an official document decorated with the coat of arms of Hungary which verifies the successful completion of studies on the Environmental Engineering Master’s program. The diploma contains the following data: name of HEI (higher education institution); institutional identification number; serial number of diploma; name of diploma holder; date and place of his/her birth; level of qualification; training program; specialization; mode of attendance; place, day, month and year issued. Furthermore, it has to contain the rector’s (or vice-rector’s) and the committee chair’s original signature and the seal of HEI. The University keeps a record of the diplomas issued.
At the graduand’s special request a certificate on the completion of studies is issued. The document (might be necessary for e.g. for PhD application) does not contain any reference to qualification, it merely proves that the candidate has passed the state exam. The Faculty keeps a record of the certificates issued.
The grade average of the three parts of the state exam (state exam grade) equals the diploma grade.

**Classification of the award:**

Outstanding      4.81 – 5.00
Excellent           4.51 – 4.80
Good                 3.51 – 4.50
Satisfactory       2.51 – 3.50
Pass                 2.00 – 2.50

**Award with Distinction**
An award with Distinction is permitted where a student obtained grade 5 in all subjects of the state exam. The average of thesis grade, his/her exam grades and mid-semester grades during his/her studies is at least 4.00. Moreover, he/she is not permitted to have a grade worse than grade 3 during his/her studies.

1. **Submitting and evaluating thesis**

Thesis (readiness for submission previously approved by the supervisors) with a photo is supposed to be submitted in person in one bound copy and one electronic copy in room 312, Department of Environmental Engineering.

Deadline: in the first semester of the academic year 2018/19

**7 December 2018, 12.00 noon**

*Thesis should also contain a 1-2 page long English summary. This brief summary should also be submitted separately in one copy (when submitting thesis) to the state exam committee. The CD should contain the following: thesis in MS Word and PDF, Thesis Topic Announcement Form, color scan of Supervisor’s Declaration and Plagiarism Statement with original signature, photo, color scan of Confidentiality Agreement (if any), English Table of Contents, English Summary. The documents on the CD should be labelled appropriately.*

On the deadline date (after 12.00 noon) the internal supervisors come together and decide whether the submitted theses are acceptable and appropriate for review. Late submissions cannot be considered. Binding, printing or any other related issues cannot be taken into account. Only theses which meet all the format and content requirements can be accepted.

Afterwards the Department will arrange for the thesis to get to the reviewer. Theses should be returned to the department (along with internal and external reviews) until **11 January 2019, 12.00 noon**, as state exam is permitted with a review attached to thesis.

A so-called ***departmental discussion*** will take place on that day where a committee will decide which theses are suitable to be evaluated by the State Examination Committee. Participation in the discussion is **mandatory** for all candidates (those who have submitted thesis and intend to take the state exam). At the same time the program coordinator and the Head of Department will inform candidates about the exact order of their taking the exam.

The State Examination Committee will decide on the final grade awarded for thesis.

**Date of state exam: 17 January 2019**

in line with requirements set previously.

Debrecen, 10 September 2018

**Prof. János Tamás**

University Professor, Program Coordinator

**Dr Ildikó Bodnár**

College Professor, Department of Environmental Engineering

Appendix 1

**D I P L O M A**

**(7 mm, gilded)**

 Name:

Debrecen

Year

Appendix 2

**Diploma**

**Title**

**Photo**

**NAME**

Environmental Engineering MSc student

Debrecen

Year

Appendix 3

**PLAGIARISM DECLARATION**

I, the undersigned ................................................................................................................ (Neptun-code: …………….......) by signing the present statement declare that the thesis, entitled

……………………………………………………………………………………..............................................................................................................................................................................

- hereinafter called thesis - is my independent work. In the course of preparing thesis I conformed to the rules of Act No. LXXVI of 1999 on Copyright, and the regulations of the University of Debrecen regarding the principles of preparing thesis, particularly in respect of references and citations.

I declare moreover that in the course of preparing thesis, in view of the condition of independent work I did not mislead my supervisors.

I also declare that the submitted thesis in paper form and its electronic version are the same in every aspect (see Rules and Regulations, Article 24, Section 8).

By signing the present statement I take notice of the fact that the University of Debrecen has the right to deny the acceptance of thesis and take disciplinary action against me if it is demonstrably not my intellectual creation, if any infringement of copyright falls under suspicion.

The denial of the acceptance of thesis and the disciplinary procedure do not affect other legal consequences (Civil Law, Law of Petty Offence, Criminal Law) caused by the infringement of copyright.

Debrecen, ...............................................

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

Student's Signature

**INTERNAL SUPERVISOR’S DECLARATION**

I hereby declare that the present thesis of the above named student is suitable for submission. Also, I recommend that he/she should take the state exam.

Debrecen, .....................................................

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

Internal supervisor’s signature

Serial number: KM\_MSc-N/L-01/20....

**THESIS**

**For Environmental Engineering MSc student, called**

**.......................................................................................................................................................................................(Student’s name)**

**......................................................................................................................................................................................................**

**(Title of thesis)**

|  |
| --- |
| **Subtasks to be solved:** |
| *Date of registration (the course, called Diplomawork II) on Neptun:* | ***Date of consultation*** | ***Internal supervisor’s signature*** | ***External supervisor’s signature*** |
| * 1. 1. Introduction, addressing the problem
 |  |  |  |
| * 1. 2. Literature background
 |  |  |  |
| * 1. 3. Introducing the company (profile, activities), the technology investigated
 |  |  |  |
| * 1. Results and their investigation
 |  |  |  |
| * 1. 5. Summary, conclusions
 |  |  |  |

**\***Remarks in the chart: he/she met the requirements, he/she did not meet the requirements, signature

EXTERNAL SUPERVISOR: ................................................................................................................................................

(name, position)

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

(company’s name, address)

INTERNAL SUPERVISOR:

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

(name, position)

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

(Workplace, address)

Student took part in Faculty Conference of Students’ Scientific Association/National Conference of Students’ Scientific Association (yes/no):............................................................................................................................. (Date, placing)

Date: Debrecen, ..................................

**Prof. János Tamás Dr Dénes Kocsis**

**Program coordinator Head of Department**

**ASPECTS OF EVALUATION FOR**

**THESIS**

**ENVIRONMENTAL ENGINEERING MSC**

**Student’s name: ...............................................................................................................**

**Title of thesis:....................................................................................................................**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Aspects of evaluation/Written in a few sentences** | **Min-max. scores** | **Scores gained** |
| 1. | Extent to which the selected topic is up to date: | **1-10** |  |
| 2. | Format, aesthetic design of thesis: | **1-10** |  |
| 3. | Extent to which literature in connection with the selected topic has been utilized: | **1-10** |  |
| 4. | Extent to which the material and method applied are suitable, scientific quality of thesis: | **1-20** |  |
| 5. | Scientific evaluation of the results obtained: | **1-40** |  |
| 6. | Extent to which conclusions and suggestions are scientifically well-founded:  | **1-10** |  |
|  |  | **Scores total:** |  |
|  | ***Recommended grade:*** |  |

Questions (raised by the reviewer and addressed to the candidate) in the state exam (min. 1, max. 3 questions):

Debrecen, ...........................................................

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

**Reviewer’s signature**

***Thesis marking scale:***

*0-50 scores fail (1)*

*51-65 scores pass (2)*

*66-75 scores satisfactory (3)*

*76-85 scores good (4)*

*86-100 scores excellent (5)*