

APPROVED

by Academic Council of the
Faculty of Computer Science of
National Research University
Higher School of Economics

Guidelines for the preparation, evaluation, defence and publication of theses for the “Master of Data Science” programme in field 01.04.02 “Applied Mathematics and Computer Science”

1. General provisions

- 1.1. These Guidelines for the preparation, assessment, defence and publication of Master’s theses for the Master’s “Master of Data Science” programme in the field 01.04.02 “Applied Mathematics and Computer Science” (hereinafter referred to as the “Guidelines”) are prepared on the basis of and in accordance with the “Regulations for Term Papers and Theses Prepared by Students of the Bachelor’s, Specialist and Master’s Level at National Research University Higher School of Economics” (Annex to HSE University Directive No. 6.18.1-01 / 1007-02, dated July 10, 2015, as confirmed by the Academic Council of HSE University, Minutes No. 8, dated November 28, 2014).
- 1.2. These Guidelines establish the recommended procedure for the preparation of theses, specify requirements for their structure, content, scope, design and formats, timeframes for various stages of work on a thesis, relevant evaluation criteria, procedure for defence, as well as proposing requirements for thesis reviews.
- 1.3. Theses are drafted and presented in English if the courses under the Programme are partially or fully taught in English.
- 1.4. The implementation of these Guidelines is obligatory for students of the Master’s “Master of Data Science” programme (hereinafter referred to the text of the EP) with respect to the preparation, defence and publication of thesis works.

2. General Requirements for Thesis Works

- 2.1. Theses can be performed by students of the Programme in an academic or project- research format (p. 3.4 of the Regulations).

Academic format — research carried out in order to obtain new knowledge regarding the structure, properties and patterns of the analyzed object (phenomenon).

Design and research (engineering) format — application development problems, resulting in the creation of a certain product (project solution).

- 2.2. Theses can be composed by students in groups. In this case, the contribution of each student should be clearly separated.

3. Preparing a Thesis on the Same Topic by Several Students

- 3.1. With permission of their scientific advisor, several students can individually prepare a thesis on the same topic.
- 3.2. The scientific advisor shall be responsible for making sure that papers prepared by different students on the same topic differ. Furthermore, research outcomes, obtained by all students preparing their thesis on the same topic, must eventually be different. In order to ensure diversity of papers, the scientific advisor can set different tasks, or suggest that students should use varying research methods, etc. The students may also design different modules as part of the same software product, while the scientific advisor will be responsible for distributing such modules between the students in a way, which would permit to assess competencies of each student in the relevant field.
- 3.3. In all other respects, the preparation and assessment of theses on the same topic will follow the established procedures.

4. Stages of Thesis Preparation

- 4.1. The main stages of the preparation of the thesis are set out in a general form by Annex 2 to the Regulations. These Guidelines supplement the above-mentioned Annex 2 without abolishing or replacing its contents in whole or in part. The list and deadlines for the preparation and defence stages of the thesis, adopted by the Programme, are specified in Annex 2 to the Regulations.
- 4.2. The subject of the thesis is chosen by the student in the second year of study (p. 3.3 of the Regulations). By the end of the third week of the third module of the second education year, the student shall inform the academic supervisor of the Programme and the Programme Office on the topic and format of the thesis. A written statement is made in this regard in the name of the academic supervisor of the Programme (Annex 3).
- 4.3. Not later than one month before the official deadline for submitting final versions of term papers/theses to the Programme Office, the student has the right, in agreement with his/her supervisor, to change the topic and format of the thesis by submitting to the Programme's academic supervisor a corresponding written statement signed off by both the former supervisor and the new supervisor.
- 4.4. During the third module of the second academic year, the thesis supervisor and the Programme's office shall provide the student with the necessary consultations and assistance upon request, including on issues related to the thesis public defence procedure.
- 4.5. The student shall submit the final version of the thesis to the thesis supervisor no later than 3

(three) weeks before the defence date.

- 4.6. The student shall submit the final version of the thesis, along with the review of the supervisor and the report from the Antiplagiat system, to the Programme Office no later than two weeks before the date of defence.
- 4.7. Other issues related to the preparation of the thesis shall be governed by the Regulations.

5. Thesis Supervision

- 5.1. Matters related to the academic supervision of theses are governed by p. 5.2 of the Regulations.
- 5.2. The supervisors of the thesis prepared by students of the Programme are mainly appointed from among HSE University staff holding an academic degree, as well as practitioners with experience in the IT industry.
- 5.3. Thesis supervisors can also be employees of outside organizations who meet the requirements of pp. 5.2.3 of the Regulations. For students who have a thesis supervisor who are not employees of HSE University, a curator is appointed from among HSE University staff (pp. 5.4.2 of the Regulations).
- 5.4. Duties and rights of the thesis supervisor are determined in pp. 5.1.2 and 5.1.3 of the Regulations.
- 5.5. Within 7 (seven) calendar days after receiving the final version of the thesis from the student, the supervisor shall review and evaluate the thesis, guided by the general criteria specified in the sample review, and provide a detailed commentary that describes the main advantages and disadvantages of the thesis under review, theoretical and practical applicability of thesis results (Annex 4 – reviewing theses). The supervisor shall then submit the review to the student for uploading to the LMS, with its copy sent to the Programme Office.
- 5.6. For works submitted after the deadline specified in these Guidelines (Annex 2), the supervisor has the right to give an unsatisfactory grade without considering the content of the work.

6. Thesis Content Requirements

- 6.1. If the thesis is written in a project-based and research format, technical documentation shall be drawn up. The documentation should cover the following aspects:
 - Formulation of the problem;
 - Introduction and review of the available results and current approaches;
 - Techniques and methods used;
 - Experiments (if they were conducted as part of the work on the thesis).

- 6.2. The technical documentation, the program (source codes, the executable file, etc.) and the presentation must be uploaded in a single archive to the LMS, to the module “Final Qualification Work”. Upon the approval of academic supervisor, the student may be allowed not to provide the source code.
- 6.3. Explanatory note must be transferred from the LMS to the Antiplagiat system.
- 6.4. If the thesis is written in an academic format, a report shall be prepared. The report includes :
- Title Page (Annex 5);
 - Abstract;
 - Table of Contents;
 - Definitions, designations and abbreviations;
 - Introduction;
 - The main body (3-5 chapters: overview, stages, main theoretical results, implementation and / or experiment, analysis of the results);
 - Conclusion;
 - List of used sources;
 - Applications.
- 6.5. The thesis, applications (source codes of the program, executable file, etc.) and presentation must be uploaded in a single archive to the LMS, to the module “Final Qualification Work”.
- 6.6. The thesis report must be transferred from the LMS to the Antiplagiat system.
- 6.7. Applications to the thesis (the source program code , the executable file, etc.) are recommended to be placed in open access (for example, GitHub or Yandex.Disk), with an indication of the respective link in the report on the thesis.
- 6.8. Theses is considered to be submitted, subject to the submission of a set of the following documents:
- Final version of the thesis, previously uploaded to the LMS;
 - Abstract, with the signature of the thesis supervisor and the student;
 - Report on plagiarism verification from the LMS, which includes the student’s consent to publish a thesis on the HSE University portal (website);
 - Feedback from the thesis supervisor with his / her signature.
- 6.9. In case of exceeding the permissible 20% of matches following the plagiarism check, the supervisor shall, no later than 5 (five) working days before the scheduled date of a thesis defence, confirm (or disprove) the originality of the verified text, provided that, during the initial technical verification, the original content was below less 80%.

7. Thesis Public Defence Requirements

- 7.1. Theses written by students of the Programme shall be subject to mandatory public defence. The procedure for defence is regulated by the Regulations for Final State Certification of Students

of Bachelor's, Specialist and Master's Programmes at National Research University Higher School of Economics, enacted by directive of the Rector of HSE University No. 6.18.1-01 / 2004-08, dated April 20, 2017.

- 7.2. The public defence of theses completed by students of the Programme takes place in the third module according to the approved schedule.
- 7.3. For the public defence of theses, the State Examination Board (SEB) is formed in accordance with the established procedure.
- 7.4. The defence procedure includes the presentation of the thesis author (recommended time of the presentation is 10 minutes and should not exceed 15 minutes), questions from the SEB members and answers given by the student, the final words of the student, including answers to the comments of the reviewer and SEB members. It is desirable that thesis supervisors attend the thesis defence process.
- 7.5. Grading of theses shall be based on the criteria below. At the same time, for each work only those criteria are used that are applicable to the given type of work.

No.	Assessment Criteria
1.	Accurate and clear statement of goals and objectives of the paper / Achievement of the goals and objectives of the paper
2.	Using all sources of information available (books, articles, HSE University's e-library and Internet resources, etc.)
3.	Extent of the paper's research / theoretical component complexity and / or scope
4.	Extent of the programme implementation / proposed technological solutions complexity and/or scope Novelty and relevance of research outcomes
5.	Academic supervisor's final grade (provided in the feedback) The reviewer's grade
6.	Presentation at the thesis defence (report and answers to questions)
7.	Application (software program) performance / quality and completeness of the research
8.	Formatting of the technical documentation or Explanatory notes to the research paper
8.1	Formatting of the bibliography / References to sources in the texts

- 7.6. Grading is done by rounding off the average points given by all members of the board. Grades are given on both a 5- and 10-point scale.
- 7.7. The results of the thesis defence may be declared invalid by the SED chairperson in case of violation of the State Final Certification procedure.

8. Special Arrangements for Preparing a Thesis by a Group of Authors

- 8.1. A thesis is prepared as an individual paper, which allows the examination board to assess the student's qualification in the result of mastering the Programme. Each student must submit an individual thesis report and make his/her own presentation at the public defence.
- 8.2. A thesis can be prepared as part of a team (group) project. In this case, the paper must include the general description of the team project, describe the relation between the thesis tasks and tasks of the entire project, as well as general project's outcomes and input of the thesis to the final project outcomes. Similarities in the texts of these chapters in different theses prepared as part of the same team project will not be considered as plagiarism, and it will be taken into account by the academic supervisor, when the thesis is verified for plagiarism via the LMS.
- 8.3. The public defence and assessment of a thesis prepared as part of the team project shall be conducted pursuant to the common rules for all theses.

9. Appeals Against the Results of Thesis Defences

- 9.1. An appeal may be filed personally by the student no later than the next working day after the announcement of the grade. An appeal is submitted in the form of an application to the Programme Office.
- 9.2. The reason for filing an appeal can only be a violation of the established procedure for the defence of the thesis.
- 9.3. The procedure for consideration of appeals is in accordance with section 4 of the Regulations on the State Supervisory Board of HSE.
- 9.4. The decision of the appeals committee is final and shall not be subject to revision.

10. Requirements for the Publication and Storage of Theses

- 10.1. The programme fully complies with the requirements presently in place at HSE University and / or those that may be established by HSE University in the future in regards to the public accessibility of theses.
- 10.2. The State Examination Board may recommend the publication of the results of a thesis in academic and technical publications, the publication of abstracts and full texts of theses on the HSE University portal and other Internet resources.
- 10.3. The electronic thesis, which have been defended, shall be stored at the Programme Office for 5 (five) years after the completion of students' training, and shall then be transferred to the HSE University Archive for storage.

Stages and Deadlines for Selection and Approval of Thesis Topics

No	Stage	Responsible party	Deadlines
5.	Publication of data on topics and supervisors, the Guidelines and deadlines on the programme's website	Programme Office / Programme Coordinator	No later than the start of the third module of the second year
6.	Topic proposals by students	Students/ Departments/ Academic Supervisor	Within the first 7 days of the third module of the second year
7.	Review of topics proposed by students	Students/ Academic Supervisor / Academic Council	Decision on whether to approve topics proposed by students must be taken within 7 days
8.	Selection of thesis topics by students	Students	The first three week of the third semester of the second year
9.	Assigning thesis topics by a directive, and notifying relevant supervisors	Academic Council/ Programme Office / Academic Supervisor /Dean	The Academic Council must assign topics and supervisors within 5 (five) working days after their selection The directive is issued within the first four weeks of the third module of the second year
10.	Changing or revising thesis topics	Students/ Programme Office / Academic Supervisor /Dean	No later than 1 (one) calendar month before the official deadline for submitting final versions of term papers/theses to the Programme Office

Key Stages of Thesis Preparation

No	Stage	Parties involved	Deadlines
1.	Preparation of the outline of the thesis , and its review by the supervisor	Student/ Supervisor	No later than two months before the defense period
2.	Submission of the first draft of the thesis	Student/ Supervisor / Programme Office	No later than one calendar month before the scheduled defense period
3.	Revision and final draft of the thesis (including submission of the final version and abstract to the supervisor)	Student/ Supervisor	No later than three weeks before the defense period
4.	Supervisor's review of the thesis	Supervisor/ Programme Office	Within 1 (one) calendar week after receiving the finished thesis
5.	Uploading the thesis to the Antiplagiat system (via special LMS module)	Student	No later than two weeks before the thesis defense period
6.	Final submission of the finished thesis to the Programme Office	Student/ Programme Office	No later than two weeks before the thesis defense period
11.	Defense	Student/ Supervisor/ Academic Supervisor/ Dean	Deadlines are determined by the curriculum and FSC schedule in accordance with the Regulations for the State Final Certification of HSE Students

National Research University – Higher School of Economics
Faculty of computer science
Master’s Programme “Master of Data Science”

APPLICATION
for Thesis topic approval

Student _____

Topic
(English)

Approved by supervisor:

_____ <i>Degree, department (place of work)</i>	_____ <i>Full name</i>	_____ <i>Signature</i>
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Approved by student:

Student
Signature : _____

Consultant (if applicable)

_____ <i>Degree, department (place of work)</i>	_____ <i>Full name</i>	_____ <i>Signature</i>
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Approved by Master’s Programme
Academic Supervisor

Signature

Moscow, <YEAR>

Supervisor's review for the thesis

Name of the student _____

Year _____

Faculty _____

Title:

“ _____ ”

No	Evaluation criteria	Grade by supervisor (on a 10-point scale)
1.	Content of the thesis corresponds with the title	
2.	Goals and objectives stated in the thesis have been accomplished	
3.	Originality and novelty of the thesis	
4.	Degree of independence of the student during research for thesis	
5.	Formatting and composition of the thesis	
	Final grade for theses, that appear in the academic transcript of the student	

Comments:

Supervisor _____

/signature/ _____

(Full name, Degree, title, department (place of work))

Date

**National Research University Higher School of Economics
Faculty of Computer Science
Programme 'Master of Data Science'**

**MASTER'S THESIS
topic**

Student _____
<Full name>

Supervisor: _____
<degree>, <title>, <full name>

Consultants: _____
<degree>, <title>, <full name>

Moscow, <YEAR>