

Guidelines for Writing, Evaluating, Defending, and Publishing

Term Papers and Theses Prepared by Students in the 01.03.02 “Data Science and Business Analytics” Bachelor’s Programme at the Faculty of Computer Science at HSE University

TABLE OF CONTENTS

1. General Provisions
2. General Requirements for Term Papers and Theses
 - 2.1. Term Paper and Thesis Format
 - 2.2. Completion of Term Papers and Theses on One Topic by Several Students
 - 2.3. Term Paper and Thesis Supervision
 - 2.4. Submission and Approval of Original Term Paper/Thesis Topics
3. Term Paper Preparation
 - 3.1. Term Paper Stages
 - 3.2. Requirements for the Structure, Contents and Scope of the Term Paper
 - 3.3. Public Defence and Evaluation of the Term Paper
 - 3.4. Appeals and Unsatisfactory Grades for Term Papers
 - 3.5. Features of Completing and Defending Group Term Papers
4. Thesis Preparation
 - 4.1. Thesis Stages
 - 4.2. Requirements for the Structure, Contents, Scope, and Procedures for Submitting the Thesis Paper
 - 4.3. Providing Feedbacks and Reviews on Theses
 - 4.4. Requirements for the Public Defence of the Thesis
 - 4.5. Appealing the Results of the Thesis Defence
 - 4.6. Features of Completing Group Theses
 - 4.7. The Features of Completing a Thesis in Instances of a Transfer to an Individual Curriculum
- Appendix 1. List of deadlines for term paper stages: topic selection and approval, term paper development and defence
- Appendix 2. List of deadlines for thesis stages: topic selection and approval, thesis development and defence
- Appendix 3. Sample term paper topic application
- Appendix 4. Sample thesis topic application
- Appendix 5. Samples of title pages for term papers, group term papers, and theses
- Appendix 6. Feedback and review template for term papers and theses completed as a research project
- Appendix 7. Feedback/Review template for software project completed as part of a term paper/thesis
- Appendix 8. Methodological Guidelines for term papers and theses

1. General Provisions

1.1. These Guidelines were developed in accordance with Appendix to Order No.636 “Procedures for Holding Final State Examination for Bachelor’s, Specialist and Master’s programmes”, dated June 29, 2015, approved by the Ministry of Education and Science of the Russian Federation and with p. 1.5 and 1.7 of *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* (approved by the HSE University Academic Council, minutes No. 8, dated November 28, 2014) (hereinafter, Regulations).

1.2. These Guidelines specify the timeframe and additional requirements for the composition, evaluation, defence and publication of term papers and theses by students in the Bachelor’s programme “HSE and University of London Double Degree Programme in Data Science and Business Analytics” (hereinafter, Programme).

1.3. These Guidelines, Regulations, and Methodological Guidelines for the degree programme complement and clarify one another. If contradictory points are identified, a final decision shall be made by the Programme’s Academic Supervisor in agreement with the programme manager.

1.4. Upon admission to the programme, students are required to familiarize themselves 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” and these Guidelines.

2. General Requirements for Term Papers and Theses

2.1. Term Paper and Thesis Format

According to the type of work, term papers and theses are divided into:

Research project refers to research carried out to obtain new knowledge about the studied subject (phenomenon) or the development of new/improvement of existing methods and algorithms for solving theoretical and applied problems. New knowledge constitutes the key result of the research project. The research project includes a description of the subject area, formulation of a research question, a review of previous works on the subject, a definition and justification of the proposed hypotheses and solutions, and a summation and evaluation of the results.

Software project refers to the development of a software system or hardware and software suite. The main result of a software project is a finished, operational software system or hardware and software suite. This type of work includes: drawing up a statement of work; reviewing and doing a comparative analysis of existing solutions; describing the proposed solution in a detailed and formal way; setting out the system or technology from a user’s point of view; justifying the chosen solutions, including on the basis of an experimental evaluation; doing a comparative analysis of the proposed system or technology with well-known analogues in terms of functionality, effectiveness, and user-friendliness; and presenting the system and the user guide for it.

In accordance with the format of term papers and theses, they are predominantly the individual work of a student, however, they can be completed in groups as well. When completed in groups, the tasks must be clearly divided between team members and the work of each team member evaluated separately. Features of group term papers and theses are described in detail below in the relevant section.

Term papers and theses are prepared and defended in English.

2.2. Completion of Term Papers and Theses on One Topic by Several Students

2.3.1. With permission of the supervisor, several students may individually complete term papers or theses on the same topic.

2.3.2. In this case, the supervisor bears the responsibility of ensuring variation in the works completed by different students on the same topic. Therefore, the final results of the works of all students addressing the same topic should be different. Methods for ensuring variation may include posing different research questions, suggesting different research methods be used, etc.

2.3.3. In all other aspects, the preparation and evaluation of term papers and theses written on the same topic by several students shall remain the same.

2.3. Term Paper and Thesis Supervision

2.4.1. Term paper and thesis supervisors are predominantly university staff that hold PhD, Candidate of Sciences, or Doctor of Sciences degrees, as well as practitioners with no less than three years of experience in the field, including those working at the University on a part-time basis.

2.4.2. For those students with a term paper or thesis supervisor who is not a University staff member, a co-supervisor from among the University staff must be appointed. The co-supervisor monitors the progress of the term paper or thesis and ensures it meets the content requirements and design criteria. When a thesis or term paper is completed in a group format, one supervisor and one co-supervisor shall be appointed.

2.4. Submission and Approval of Original Term Paper/Thesis Topics

2.5.1. Upon developing an original term paper or thesis topic (i.e. not from the suggested list of topics), the student must independently find a relevant supervisor for the topic. If the term paper/thesis supervisor is not chosen from among University staff, the student, upon submitting his/her original topic, must also find a teacher or researcher from HSE University to agree to serve as a co-supervisor of the work.

2.5.2. The co-supervisor candidate must be agreed upon and approved by the degree programme's Academic Supervisor. To this end, the student must write a justification of the topic in which he/she explains the suggested topic, selects a work's supervisor not from HSE University (including, if possible, academic degree, academic title, position and place of work, office contact information), selects a co-supervisor from among HSE University staff, formulates a working hypothesis/key concepts/tasks, defines the question that the work will address, and describes the planned project in enough detail so that its conformity to the Programme's focus can be assessed. The justification is sent to the corporate e-mail address of the degree programme's Academic Supervisor and programme manager no later than 5 (five) calendar days before the end of the topic selection period in LMS.

2.5.3. Only after the original topic has been approved, either in person or in writing, does the student enter the topic in LMS as an original proposal; in the "supervisor" field, the full name of the co-supervisor from HSE University is specified. The degree programme's Academic Supervisor approves

via LMS the cooperation and the topic, provided the topic and research design correspond to the subject of Computer Science and the other criteria established for term papers and theses prepared by students of the Programme.

3. Term Paper Preparation

3.1. Term Paper Stages

3.1.1. A list of deadlines for the various term paper stages (selection and approval of the topic, preparation, defence) is provided in **Appendix 1**.

3.1.2. An interim assessment of the term paper is conducted primarily by the term paper supervisor. Within the time frame specified in **Appendix 1** (paragraph 10), the term paper supervisor evaluates the current results of the student (**Grade_Interim**) and writes a short review of the student's work, justifying the grade. Evaluations and feedbacks are collected electronically.

3.1.4. The final version of the term paper is presented in electronic form by uploading the text, formatted in accordance with the methodological guidelines, to the LMS module by the established deadline. The text uploaded to LMS is considered final.

3.1.5. If a project is submitted later than the deadline specified in **Appendix 1** (paragraph 17), the supervisor has the right to give an unsatisfactory grade without reviewing the contents. Instances of unsatisfactory grades are regulated by pp. 3.4.2.

3.1.6. The term paper supervisor writes feedback and grades the term paper (**Grade_of the Term Paper Supervisor_for the Term Paper**) according to the criteria specified in the sample **supervisor feedback** and supports his/her grade by a short commentary on the paper's primary strengths and weaknesses (**Appendix 6** – research project, **Appendix 7** – software project).

3.1.7. The student is responsible for submitting the term paper supervisor's signed Feedback and Report on the plagiarism check from LMS with the student's signature to the Programme Office by the established deadline. The term paper is considered submitted and the student is allowed to defend it only after this condition has been met.

3.2. Requirements for the Structure, Contents and Scope of the Term Paper

3.2.1. The results of the project are included in a report that follows the Methodological Guidelines provided in **Appendix 8**. Special attention should be paid to section 2 of the Appendix which specifies the mandatory requirements for formatting the text.

3.2.2. The title page of the term paper is formatted in accordance with **Appendix 5**.

3.2.3. It is recommended that appendices to the term paper (software's source code, programme files, new data collections etc.) shall be posted to the public domain (for example, GitHub or Yandex.Disk) with the link specified in the term paper report.

3.2.4. When completing a term paper in the form of a software project, the student must provide the project's source code, together with the report (within the same timeframe). It is recommended to post the source code to the public domain (for example, GitHub or Yandex.Disk) with the appropriate link

specified in the term paper report. Access to the code can also be restricted, provided the degree programme's Academic Supervisor and members of the examination board are given access. All cases in which providing the code is not possible (for example, if the project is completed for a company) must be agreed on individually with the degree programme's Academic Supervisor.

3.3. Public Defence and Evaluation of the Term Paper

3.3.1. Term papers are subject to a mandatory public defence before an examination board. The public defence occurs in Module 4 according to a pre-approved schedule.

3.3.2. The Academic Supervisor, with the assistance of the departments in which the term paper supervisors work, sets up a board comprised of academic staff members and doctoral students from the HSE University Faculty of Computer Science, academic staff members from other research and educational organizations whose focus matches that of the degree programme "Data Science and Business Analytics", and company representatives.

3.3.3. A student's defence cannot begin without the submission of the signed Supervisor Feedback and the Report on the check for plagiarism from LMS signed by the student to the board. The Academic Supervisor or Examination Board's chairman shall determine whether a hard copy of the term paper needs to be submitted. In such cases, the student brings a print version of the term paper to the defence and places it on the board's table.

3.3.4. The defence of the term paper proceeds in the form of an oral report with a presentation. The recommended length of the report is 7 minutes but no longer than 10 minutes. The report must include the formulated research question and the results received, both at a substantiation level and in an appropriately formalized way. It is recommended to give regard for the criteria specified in the template for the supervisor's feedback of the term paper and ensure the report reflects all the information necessary to evaluate the work by the given criteria. The rules for drafting the presentation are reflected in section 4 of the Methodological Guidelines in **Appendix 8**.

3.3.5. The board's members award grades for the term paper (**Grade_of the Board_for the Term Paper**) according to the general criteria specified in the sample supervisor feedback (**Appendix 6** - research project, **Appendix 7** - software project).

3.3.6. In the event of differing opinions, the term paper grade is determined by a simple majority vote by the Board members. If there are a tie of yes and no votes, the Board's chairman shall have the deciding vote. The grade is calculated on a 5- and a 10-point scale.

3.3.7. Following a discussion by the members of the board for the defence of the term paper, minutes are recorded according to the established template.

3.3.8. The final grade for the term paper is calculated according to the following formula:

$$0.2 * \text{Grade_Interim} + 0.3 * \text{Grade_of the Tem Paper Supervisor_for the Term Paper} + \\ + 0.5 * \text{Grade_of the Board_for the Term Paper}$$

3.4. Appeals and Unsatisfactory Grades for Term Papers

3.4.1. Term paper appeals are conducted as per the procedures established for appealing the exam results in the Regulations for Interim and Ongoing Assessment of HSE University Students (pp. 4.3.6 of the Regulations).

3.4.2. A student who receives an unsatisfactory grade for a term paper is considered to have failed the assignment, and this failing mark must be removed according to the established procedure. At this time, it is possible to change the topic and term paper supervisor by submitting an application to change the term paper topic and supervisor to the Programme Office and having a directive issued by the dean of the Faculty of Computer Science. The procedure for a retake of the term paper is regulated by the *Regulations for Interim and Ongoing Assessment of HSE University Students* (pp. 4.3.8, 4.3.9 of the Regulations).

3.4.3. The deadlines for uploading and submitting the final version of the term paper are determined upon approval of the schedule for autumn retakes.

3.5. Features of Completing and Defending Group Term Papers

3.5.1. When completing term papers in a group, the tasks must be clearly divided among team members and the work of each team member shall be evaluated separately.

3.5.2 For a group term paper, one common report shall be drawn up. The report should be structured according to the same format as that for individual term papers (see Methodological Guidelines in **Appendix 8**). The report should clearly reflect the tasks and contributions of each member, and clearly trace the connection between the contribution of each separate student and the overall results. The report may have one common introduction and conclusions. However, in the main body, each team member must independently describe his/her part in the project.

3.5.3. The title page of the report for group term papers is formatted according to **Appendix 5** in the same language in which the report is written.

3.5.4. The term paper supervisor appoints one of the group members to be responsible for uploading the final version of the group project to LMS by the established deadline.

3.5.5. The student responsible for uploading the final version of the group project presents the Report on the plagiarism check to the Programme Office and shares a digital copy with all group members.

3.5.6. The supervisor prepares separate feedback for each student in the group which indicates a grade for the work and contribution of the given student (**Appendix 6** - research project, **Appendix 7** - software project).

3.5.7. The public defence of the group term paper is held in the form of a joint report. The recommended length of the report for groups of two students is 15 minutes (20 minutes maximum), and for a group of three or more students - 20 minutes (25 minutes maximum). Each member of the group must take part in the report, with each member describing his/her part of the work (any member may explain the common introduction and conclusions). The report should clearly reflect both the common results achieved, as

well as the individual contribution of each group member. Rules for drafting presentations are reflected in section 4 of the Methodological Guidelines in **Appendix 8**.

3.5.8. Based on the results of the public defence, the Board awards a grade to each group term paper member.

3.5.9. The formula for calculating the final grade of each participant in the group term paper is the same as the one for individual term papers and specified in p. 3.3.8.

4. Thesis Preparation

4.1. Thesis Stages

4.1.1. A list of deadlines for the various thesis stages (selecting and agreeing on the topic, writing, defending the work) is provided in **Appendix 2**.

4.1.2. The final version of the thesis is presented in electronic form by uploading the text, formatted in accordance with the methodological guidelines, to the LMS module by the established deadline. The text uploaded to LMS is considered final.

4.2. Requirements for the Structure, Contents, Scope, and Procedures for Submitting the Thesis Paper

4.2.1. The results of the thesis make up the body of a report that should be written in accordance with the Methodological Guidelines provided in **Appendix 8**. Special attention should be paid to section 2 of the Appendix which specifies the mandatory formatting requirements for the text.

4.2.2. The title page shall be formatted in accordance with **Appendix 5**.

4.2.3. It is recommended that appendices to the thesis (software's source code, programme files, new data collections etc.) are posted to the public domain (for example, GitHub or Yandex.Disk) with the link specified in the thesis report.

4.2.4. When completing a thesis in the form of a software project, the student must provide the source code of the project together with the report (within the same timeframe). It is recommended to post the source code to the public domain (for example, GitHub or Yandex.Disk) with the appropriate link specified in the thesis report. Access to the code can be restricted, provided the degree programme's Academic Supervisor and board members are given access. All cases in which providing the code is not possible (for example, if the project is completed for a company) must be agreed on individually with the degree programme's Academic Supervisor.

4.2.5. The student sends the final version of the thesis via corporate e-mail of the programme manager so that it can be checked for plagiarism through www.turnitin.com no later than 2 (two) working days before uploading the thesis to LMS. The results of the plagiarism check are then entered into LMS by the programme manager. Based on the results of the check, a report is generated to confirm that the thesis has been uploaded to LMS and indicate the detected percentage of matches.

4.2.7. The thesis is considered to have been submitted once the following packet of documents has been provided:

- A printed and bound copy of the thesis text previously uploaded to LMS
- Abstract signed by the thesis supervisor and student
- Report on the plagiarism check from LMS that includes the student's consent/non-consent to the publication of the thesis on the HSE University website (portal)
- Feedback of the thesis supervisor with his/her signature.

4.2.7. If the check for plagiarism finds that the percentage of similarities exceeds the allowed percent (i.e., 20%) and, hence, the originality of the text is less than 80%, the thesis supervisor shall provide a statement on the (non)originality of the given text in his/her feedback no later than 5 (five) working days before the appointed date for the thesis defence.

4.2.8. If a project is submitted later than the deadline specified in these Guidelines (**Appendix 2, p. 17**), the thesis supervisor has the right to give an unsatisfactory grade in his feedback without reviewing the contents.

4.2.9. The date for the thesis' submission is considered the date when the final version of the thesis, together with the packet of documents, is submitted to the Programme Office. If even one of the documents in the packet is missing, the student's thesis is not considered to have been submitted, and the student may not be permitted to defend the thesis.

4.2.10. The Programme Office staff member that accepts the thesis packet may verify that the printed version of the thesis corresponds to the electronic version uploaded to LMS. In the event that there are discrepancies between the print and electronic version of the thesis, the Programme Office staff member writes a statement about these mismatches (with a list of the latter). The statement on the discrepancies in the thesis versions shall be signed by the student, the Programme Office staff member that accepted the thesis, and the Programme manager. The student has 1 (one) working day to present an explanatory note to the Academic Supervisor about the reasons for these discrepancies. The Academic Supervisor, on the recommendation of Programme Manager, decides whether the reason for the discrepancies is valid or not within 2 (two) working days. If the reason is deemed not valid, the student must eliminate the discrepancies within 2 (two) days from the moment of the receipt of the written notice from the Academic Supervisor, that is, provide the Programme Office with the same version of the thesis (in printed form) that was previously uploaded to LMS.

4.2.11. If there are discrepancies found in the version of the thesis submitted by the student at his/her thesis defence and the version uploaded to LMS, the student may be subject to disciplinary action for violating the academic writing standards as per the procedures established at HSE University.

4.2.12. The publication of the thesis on the HSE University website (portal) is not mandatory. The student's consent to publication shall be noted in the report on the plagiarism check from LMS, which is signed by the student.

4.3. Providing Feedbacks and Reviews on Theses

4.3.1. The thesis supervisor shall provide feedback on a thesis and evaluate it according to the general criteria specified in the sample supervisor feedback and supports a grade given by him/her by a short

commentary on the thesis' primary strengths and weaknesses (**Appendix 6** – research project, **Appendix 7** – software project). The thesis supervisor sends the feedback to the student.

4.3.2. The requirements for thesis reviewers are set out in pp. 4.4.6 of the *Regulations*. Before April 25, the degree programme's Academic Supervisor confirms the list of thesis reviewers from among the academic staff of HSE University's Faculty of Computer Science, the staff of other HSE University subdivisions, and staff from other higher education institutions, scientific organizations and software companies who are specialists in the thesis topic.

4.3.3. The directive on the appointment of reviewers shall be issued by the dean of the Faculty of Computer Science by recommendation of the degree programme's Academic Supervisor no later than one month before the planned date of the thesis defence.

4.3.4. The Programme Office sends the final electronic version of the thesis for review. The reviewer then drafts his review and, either in person, or via the student or thesis academic supervisor, submits the original signed review to the Programme Office no later than 6 (six) calendar days before the date of the thesis defence. A scanned copy of the signed review may also be sent from the e-mail address specified by the thesis supervisor. In the case, the electronic copy of the signed review must be forwarded to the Programme Office **no later than 6 (six) calendar days before the date of the thesis defence**; specifically, it should be sent to the e-mail address of the staff member who previously e-mailed the final draft of the thesis for review. The review takes the same form as the thesis supervisor's feedback (**Appendix 6** – research project, **Appendix 7** – software project).

4.3.5. The Programme Office uploads an electronic copy of the review to LMS no later than 5 (five) calendar days before the date of the thesis defence for the student's review. The student should familiarize himself/herself with the review via his personal LMS account.

4.4. Requirements for the Public Defence of the Thesis

4.4.1. Theses completed by students of the Programme shall be publicly defended in Module 4 according to the approved schedule. The procedure for conducting a thesis defence is regulated by the Regulations on Final State Certification of Students of Bachelor's, Specialist and Master's Programmes at National Research University Higher School of Economics (hereinafter, Regulations on FSC at HSE University).

4.4.2. A State Examination Board (SEB) is formed as per the established procedure for the public defence of the thesis.

4.4.3. The process for defending the thesis involves an oral report by the author with a presentation (recommended time is 10 minutes, maximum time allowed - 15 minutes), questions by members of the board and the student's answers, and the student's closing remarks, which include answers to the reviewer's and SEB members' comments. It is preferable that the thesis supervisor is present at the defence. The report must formulate the research question and the results received, both at a substantiation level and at a formal level. It is recommended to review the criteria specified in the template for the supervisor's feedback of the thesis and ensure the report reflects all the information necessary to evaluate the work by the given criteria. The rules for drafting the presentation are reflected in section 4 of the Methodological Guidelines in **Appendix 8**.

4.4.4. Should the thesis supervisor sit on the board reviewing the work of the student he/she supervised, he/she may participate in a discussion of the given work but cannot play a role in its evaluation.

4.4.6. The results of the board members' discussion are recorded in minutes according to the standard procedure.

4.4.7. In the event of differing opinions, the grade for the public defence of the thesis is determined by a simple majority vote by the SEB members present at the defence. If there is a tie of yes and no votes, the deciding vote shall be cast by the chairman of the board. The grade is given on a 5-point and a 10-point grading scale.

4.5. Appealing the Results of the Thesis Defence

4.5.1. An appeal must be submitted personally by the student no later than the following day after the receipt of the grade. An appeal is submitted in the form of an application to the Programme Office.

4.5.2. An application for an appeal can only be submitted if there was a violation of the established procedures for conducting thesis defences.

4.5.3. Appeals shall be reviewed in accordance with the procedures established by section 4 of the Regulations on FSC at HSE University.

4.5.4. The decision of the appeals committee shall be final and cannot be revised.

4.6. Features of Completing Group Theses

4.6.1. A thesis is an individual work that enables the evaluation of the student's qualifications upon completing the Programme. Each student must submit an individual thesis report and defend the thesis in public.

4.6.2. The thesis can be completed as part of a team (group) project. In this case, the thesis must include a description of the team project, as well as specify the connection between the individual tasks with the tasks for the entire project, the results of the entire project, and the contribution of the given thesis to the common results of the project. Similarities between theses in these sections of the text are not considered plagiarism, and this will be factored in by the thesis supervisor when evaluating the results of the plagiarism check in LMS.

4.6.3. The public defence and evaluation of theses completed as a group project are conducted according to the rules common for all theses.

4.7. The Features of Completing a Thesis in Instances of a Transfer to an Individual Curriculum

4.7.1. In the event of a transfer to a special individual curriculum (IC) with repeated courses after the end of the winter retake period, the student has the right to postpone the preparation of the thesis and the pre-graduation internship till the next academic year by submitting an application to the dean about transferring the above elements of the curriculum to the next academic year. In doing so, the student undertakes to complete all thesis stages in full as established by these Guidelines during the following academic year.

4.7.2. In the event of a transfer to a special individual curriculum with repeated courses after the end of the additional retake period organized by decree of the dean for students in Year 4 in April, the student has the right to move the preparation of the thesis to the following academic year by submitting the corresponding application. Changes, specifically to the thesis topic or academic supervisor, are not allowed since the deadlines for these changes, as established in these Guidelines, will have passed.

4.7.3. In each of the above cases, as well as in the event of a transfer to a special individual curriculum after the autumn retake period, the deadlines for uploading the thesis to LMS to check for plagiarism, submitting the final version of the thesis for review, and presenting the packet of thesis documents to the Programme Office are specified by an additional directive on conducting final state certifications after the student fully completes the individual curriculum and removes the failing marks for all elements of the degree programme.

Appendix 1. List of deadlines for term paper stages: topic selection and approval, term paper development and defence

No.	Stage	Responsible Party	Deadline
1.	Collection of proposed term paper topics. Potential topics with suggested term paper supervisors available in the special LMS module.	Departments/ Programme Office	From September 10 to October 1
2.	Approval of proposed term paper topics by the Academic Supervisor	Degree programme's Academic Supervisor/ Programme Office	Within 7 working days from the moment the information is received from the Programme Office, the Academic Supervisor submits a list of approved term paper and thesis topics to the Programme Office
3.	Notifying departments and other subdivisions of the approved term paper topics	Programme Office / Departments	Within 2 (two) working days from the receipt of the Academic Supervisor's decision on the recommended list of topics

4.	Compilation of the final list of recommended term paper topics	Departments/ Academic Supervisor	Within 3 (three) working days from receiving the notice from the Programme Office, the departments can discuss reasons for rejecting topics. Based on the results of the discussion, the Academic Supervisor can add topics
5.	Publication in LMS of proposed term paper topics, supervisors, and the deadlines for their completion	Programme Office	No later than October 15
6.	Original term paper topics proposed by students and a discussion of the proposed topics	Students/ Academic Supervisor / Academic Committee	Approval/Non-approval of proposed topics: no later than November 20
7.	Timeframe for students to choose term paper topics and submit a respective application to the Programme Office	Students	No later than November 20
8.	Confirmation of the term paper topics and supervisors	Programme Office/ Academic Supervisor / Academic Committee/ Dean	No later than December 10 via the Dean's directive
9.	Approval of the preliminary term paper project by the supervisor (must include the relevance, structure, design, list of main sources, expected results)	Student / Supervisor	Not later than December 30

10.	Interim evaluation of the term paper progress (evaluation of the ongoing results by term paper supervisor)	Student/ Supervisor	No later than February 1
11.	Changing term paper supervisors	Student/ Programme Office / Academic Supervisor /Dean	No later than February 15
12.	Changing term paper topics	Student/ Programme Office / Academic Supervisor /Dean	Not later than April 1
13.	Approval of the thesis defence schedule	Programme Office	No later than 1 (one) week before the date of defence
14.	First presentation of the final term paper to the supervisor	Student / term paper supervisor	No later than May 10*
15.	Term paper completion and upload of the final version to the special module in LMS to check for plagiarism through Antiplagiat	Student	No later than May 17*

16.	If the percentage of matches exceeds the percentage allowed at HSE University, the supervisor provides his conclusion on the (non)originality of the given text in his feedback and sends a copy of the conclusion/feedback to the Programme Manager via e-mail	Term paper supervisor/ Manager	No later than 5 (five) working days before the defence of the thesis
17.	Submission of the final version of the term paper for feedback to the supervisor	Student	No later than May 16*
18.	Writing feedback on the term paper by the supervisor, which is then sent to student	Term paper supervisor / Student	No later than May 23*
19.	Submission of the term paper supervisor's feedback and report on the plagiarism check to the Programme Office	Student / Programme Office	No later than 3 working days before the date of the defence
20.	Public defence of the term paper	Student / Board	According to the established schedule

* For each academic year, the dates may be shifted within three working days from the specified date. The final deadline for completing the stage shall be published on the Programme site in the "Student" menu under the section "Term Papers and Theses".

Appendix 2. List of deadlines for thesis stages: topic selection and approval, thesis development and defence

No.	Stage	Responsible Party	Deadline
1.	Collecting potential thesis topics. Potential topics with names of suggested thesis supervisors shall be made available in the special LMS module.	Departments/Programme Office	From September 10 to October 1
2.	Approval of potential thesis topics by the Academic Supervisor	Academic Supervisor / Programme Office	Within 7 (seven) working days from the moment information is received from the Programme Office, the Academic Supervisor submits a list of approved thesis topics to the Programme Office
3.	Notifying departments and other subdivisions of approved thesis topics	Programme Office / Departments	Within two working days from the receipt of the Academic Supervisor's decision on the suggested list of topics
4.	Compilation of the final list of suggested thesis topics	Departments/Academic Supervisor	Within three days from receiving the notice from the Programme Office, the department can discuss the reasons for rejecting topics. Based on the results of the discussion, the Academic Supervisor can add several topics.
5.	Publication in LMS of the list of suggested thesis topics, thesis supervisors, and deadlines for thesis completion	Programme Office	No later than October 15
6.	Original thesis topic proposed by students	Students / Academic Supervisor	No later than November 1

7.	Discussion of original topics proposed by student	Student / Academic Supervisor	A decision must be made no later than November 12
8.	Student selection of thesis topics	Students	No later than November 20
9.	Approval of the thesis topics and supervisors (co-supervisors, advisors) by the Dean's directive	Programme Office /Academic Supervisor / Academic Committee / Dean	No later than December 10
10.	Student presentation of the thesis project to the thesis supervisor (must include the relevance, project structure, design, list of main sources, expected results)	Student / Thesis Supervisor	No later than December 30
11.	Approval of the thesis defence schedule	Programme Office	No later than one month before the start of the FSC
12.	Changing thesis supervisors	Student / Programme Office / Academic Supervisor / Dean	No later than February 15
13.	Changing thesis topics (followed by the approval by the directive of the Dean of the Faculty of Computer Science)	Student / Programme Office/ Academic Supervisor / Dean	No later than April 1
14.	Approving the list of thesis reviewers	Academic Supervisor/ thesis supervisors	No later than April 25

15.	Presentation of the first version of the finished thesis to the thesis supervisor (if needed, the student alter edits the text)	Student / Thesis supervisor	No later than May 14*
16.	Student verifies the information about himself, the thesis supervisor, the topic in Russian and English as per the respective directive in his/her personal LMS account and uploads the final thesis file and inputs the abstract in English and Russian in the corresponding fields	Student	No later than May 21*
16a.	If the percentage of matches exceeds the percent accepted at HSE University, the thesis supervisor provides his conclusion on the (non)originality of the given text (nature of borrowings and matches) in his/her feedback and sends a copy of the conclusions/feedback to the Programme Manager via e-mail	Student / Thesis supervisor / Programme Office	No later than five working days before the defence of the thesis
17.	Student submits the final thesis and abstract to the thesis supervisor for feedback	Student/ Thesis supervisor	No later than May 21*
18.	Supervisors write feedback and send the signed original to the student (or submit the feedback to the Programme Office)	Thesis supervisor / Programme Office / Student	Seven calendar days for writing the feedback. The feedback must be sent to the student no later than two days before the date for submitting the thesis documentation, as set by the directive on conducting the FSC

19.	Submitting the final printed thesis with abstracts, supervisor feedback, and report on the plagiarism check from Antiplagiat	Student / Thesis supervisor/ Programme Office	No later than the date, indicated in the directive on conducting the FSC
20.	Submitting the thesis for review	Programme Office / Reviewer	No later than two working days after the receipt of the thesis
21.	Reviewing, submitting the review by reviewer to Programme Office	Reviewer / Programme Office	No later than 10 (ten) calendar days before the date of the defence
22.	Familiarizing the student with the content of the review	Programme Office / Student	No later than 5 (five) calendar days before the thesis defence
23.	Submitting the thesis to local SEB , together with the supervisor's feedback and review	The SEB Secretary	No later than two calendar days before the defence
24.	Public defence of the thesis	Student / SEB / Thesis supervisor	According to the approved schedule

* For each academic year, the dates may be shifted within three working days from the specified date. The finalized deadline for completing the stage is published on the programme site in the "Student" menu under the section "Term Papers and Theses".

Appendix 3. Sample term paper topic application

**National Research University Higher School of Economics
Faculty of Computer Science
HSE and University of London Double Degree Programme in Data Science and Business Analytics**

Term paper APPLICATION

Topic:

Project format: *Software project / Research project*

I agree with the topic of the work and am aware that a term paper supervisor may only be changed before February 15; the term paper topic may be changed until 1 April of the current academic year.

Bachelor's in Data Science and Business Analytics Group –

Student

Term Paper Supervisor:

Position and academic degree *Full name* *Signature*

Advisor¹:
if needed

Position and academic degree *Full name* *Signature*

Co-supervisor²:
if needed

Position and academic degree *Full name* *Signature*

**Academic Supervisor of
Bachelor's Programme
in Data Science and
Business Analytics,
Faculty of Computer
Science**

Tamara Voznesenskaya

Appendix 4. Sample thesis topic application

**National Research University Higher School of Economics
Faculty of Computer Science
HSE and University of London Double Degree Programme in Data Science and Business Analytics**

Thesis APPLICATION

Topic:

Project format: *Software project / Research project*

I agree with the topic of the work and am aware that a thesis supervisor may only be changed before February 15; the thesis topic may be amended until 1 April of the current academic year.

Student Bachelor's in Data Science and Business Analytics Group -

Thesis Supervisor:

Advisor³:
if needed

Position and academic degree

Full name

Signature

Co-supervisor⁴:
if needed

Position and academic degree

Full name

Signature

**Academic Supervisor of the
Bachelor's Programme in
Data Science and Business
Analytics, Faculty of
Computer Science**

Position and academic degree

Full name

Signature

Tamara Voznesenskaya

^{3, 4} Thesis/term paper **advisors** from among University staff or staff of outside organizations whose professional activities and/or research interests are connected with the thesis/term paper topic may be appointed to provide additional guidance for students. The duties of the advisor include helping the student choose research methods/the project's design, select literature and research evidence, and develop the contents of the term paper/thesis. The decision regarding the need to appoint advisor(s) is made by the degree programme's Academic Supervisor (by the Supervisor's recommendation and in agreement with the Faculty's head) on the basis of the student application endorsed by the Supervisor.

Appendix 5. Samples of title pages for term papers, group term papers, and theses

National Research University Higher School of Economics

**Faculty of Computer Science
HSE and University of London Double Degree Programme in
Data Science and Business Analytics**

**TERM PAPER
(Research Project) / (Software Project)
<Title>**

**Prepared by the student of Group <Group>, < in Year: 3/4> (year of study),
<Full name ()>**

**Term Paper Supervisor:
< Academic Degree>, <Academic Title >, <Full name ()>**

**Co-supervisor:
< Academic Degree >, < Academic Title >, <Full Name ()>**

**Advisor:
< Academic Degree >, < Academic Title >, <Full Name ()>**

**Moscow
<YEAR>**

National Research University Higher School of Economics

**Faculty of Computer Science
HSE and University of London Double Degree Programme in
Data Science and Business Analytics**

**GROUP TERM PAPER
(Research Project) / (Software Project)
<Title>**

**Prepared by students: of Group <Group> in Year 3 (year of study),
<Full name 1 ()>, Group <Group>, Year 3,
<Full name 2 ()>, Group <Group>, Year 3,
...**

Term Paper Supervisor:

< Academic Degree>, <Academic Title >, <Full Name ()>

Co-supervisor:

< Academic Degree >, < Academic Title >, <Full Name ()>

Advisor:

< Academic Degree >, < Academic Title >, <Full Name ()>

**Moscow
<YEAR>**

National Research University Higher School of Economics

**Faculty of Computer Science
HSE and University of London Double Degree Programme in
Data Science and Business Analytics**

**BACHELOR'S THESIS
(Research Project) / (Software Project)
<Title>**

**Prepared by the student of Group <Group>, Year 4 (year of study),
<Full Name ()>**

Thesis Supervisor:

< Academic Degree>, <Academic Title >, <Full Name ()>

Co-supervisor:

< Academic Degree >, < Academic Title >, <Full Name ()>

Advisor:

< Academic Degree >, < Academic Title >, <Full Name ()>

**Moscow
<YEAR>**

Appendix 6. Feedback and review template for term papers and theses completed as a research project

When filling out feedback on a term paper or thesis or writing a review of a thesis, a term paper/thesis supervisor must:

1. Leave the necessary heading from among the three
2. Choose the relevant signature (term paper/thesis supervisor or reviewer)
3. Remove all auxiliary comments in this font from this template (italics and underlined)

HSE University Grading Scale:

- 10 — excellent
- 9 — excellent
- 8 — excellent
- 7 — good
- 6 — good
- 5 — satisfactory
- 4 — satisfactory
- 3 — unsatisfactory
- 2 — unsatisfactory
- 1 — unsatisfactory

Academic Supervisor's Feedback on Term Paper

(Research project)

or

Academic Supervisor's Feedback on Thesis

(Research project)

or

Review of thesis

(Research project)

Completed by a Student in Year _____, group _____ of the degree programme "Data Science and Business Analytics" at the HSE University Faculty of Computer Science

Full name

on the topic:

No.	Evaluation Criteria <i>(only assess those applicable to student's work)</i>	Score (on a 10-point scale)	Comments <i>(Here is an approximate list of the competencies developed by the student while completing the thesis. You can refer to them when describing the degree to which the evaluation criteria have been met and place your own comments in the column.)</i>
1	Research novelty		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-2 Ability to define the research essence of an issue in the professional field</i></p> <p><i>UC-3 Ability to solve issues in professional activities on the basis of analysis and synthesis</i></p> <p><i>PC-2 Ability to correctly (mathematically) formulate and prove statements, formulate results, identify the consequences of the results obtained.</i></p> <p><i>PC-4 Ability to formalize and devise an algorithm for addressing the established research task.</i></p>
2	Relevance of the work		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-3 Ability to solve challenges in professional activities on the basis of analysis and synthesis</i></p> <p><i>PC-2 Ability to correctly (mathematically) formulate and prove statements, formulate results, identify the consequences of the results.</i></p>
2	Comprehensive comparative review of known results		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-5 Ability to work with information: find, evaluate and use information from different sources that is necessary for solving academic and professional tasks (including on the basis of the systemic approach)</i></p> <p><i>PC-12 Ability to analyze, write, and edit academic and technical texts in (official) Russian to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-13 Ability to analyze, write, and edit academic and technical texts in English to solve professional and research tasks in mathematics and computer science</i></p>
3	Complexity and volume of the completed work		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-2 Ability to correctly (mathematically) formulate and prove statements, formulate results, identify the consequences of the results.</i></p> <p><i>PC-6 Ability to design and implement a complete software system with the use of already-made software modules and components</i></p> <p><i>PC-8 Ability to develop a mathematical model and use it for analysis of a proposed theoretical or applied problem</i></p> <p><i>PC-9 Ability to develop and implement, in the form of a software module, an algorithm for solving a proposed theoretical or applied problem based on a mathematical model.</i></p>

4	Quality of the composed text. Clear and structured presentation of ideas.	<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-12 Ability to analyze, write, and edit academic and technical texts in (official) Russian to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-13 Ability to analyze, write, and edit academic and technical texts in English to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-14 Ability to search for and process information in the sphere of applied mathematics and informatics, including using computer information systems</i></p> <p><i>PC-15 Ability to competently and in a well-reasoned manner present the result of your research and professional activities, including using contemporary information technology resources</i></p>
5	Adherence to the planned work schedule, meeting the deadlines for completing the main stages of the term paper, interaction with the term paper supervisor	<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-10 Ability to conduct written and oral communication in (official) Russian within the framework of professional and research communications, both interpersonal and as part of a group</i></p> <p><i>PC-17 Ability to make socially responsible decisions in atypical professional situations</i></p> <p><i>PC-18 Ability to demonstrate creativity, initiative, and perseverance in achieving goals (both professional and personal)</i></p>
FINAL SCORE		<p><i>General commentary on the work. This commentary is mandatory!</i></p> <p><u>Feedbacks with only scores WILL NOT be accepted.</u></p> <p><i><u>The final grade is not calculated as the arithmetic mean of the criteria, but on the basis of the overall evaluation of the work, taking into account the criteria. In the absence of clearly marked strengths and weaknesses, it is recommended to give a score of 7.</u></i></p> <p><i><u>When the grade is higher or lower for respective points, the commentary should specify the weaknesses or strengths in relation to the criteria.</u></i></p>

Academic Supervisor: /

Reviewer:

Position, academic degree, department/place of work

Full name

Signature

Appendix 7. Feedback/Review template for software project completed as part of a term paper/thesis

When writing feedback on a term paper or thesis or a review of a thesis, a reviewer must:

1. Leave the relevant heading from among the three
2. Choose the relevant signatures (term paper/thesis supervisor or reviewer)
3. Remove all auxiliary comments in this font from this template (italics and underlined)

HSE University Grading Scale:

- 10 — excellent
- 9 — excellent
- 8 — excellent
- 7 — good
- 6 — good
- 5 — satisfactory
- 4 — satisfactory
- 3 — unsatisfactory
- 2 — unsatisfactory
- 1 — unsatisfactory

Term Paper Supervisor Feedback on Term Paper

(Software project)

or

Thesis Supervisor Feedback on Thesis

(Software project)

or

Review of Thesis

(Software project)

Completed by a Student (s) _____ in Year ____, Group _____ of the degree programme “Data Science and Business Analytics” at the HSE University Faculty of Computer Science

Full name

on the topic:

No.	Evaluation Criteria <i>(only assess those applicable to student's work)</i>	Score (on a 10-point scale)	Comments <i>(Here is an approximate list of the competencies developed by the student while completing the thesis. You can focus on them when describing the degree to which the evaluation criteria have been met and place your own comments in the column.)</i>
1	Applicability of project results		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-3 Ability to solve problems in professional activities on the basis of analysis and synthesis</i></p> <p><i>UC-6 Ability to conduct research, including analyze the issue, set goals and tasks, define the subject of the research, choose the research methods, and assess its quality</i></p> <p><i>PC-4 Ability to formalize and devise a certain algorithm for addressing the established technical task.</i></p> <p><i>PC-6 Ability to design and implement a complete software system with the use of already-made software modules and components</i></p>
2	Relevance of the work		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-3 Ability to solve problems in professional activities on the basis of analysis and synthesis</i></p> <p><i>PC-4 Ability to formalize and devise a certain algorithm for addressing the established task.</i></p>
2	Comprehensive comparative review of known results		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>UC-5 Ability to work with information: find, evaluate and use information from different sources that is necessary for solving academic and professional tasks (including on the basis of the systemic approach)</i></p> <p><i>PC-12 Ability to analyze, write, and edit academic and technical texts in (official) Russian to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-13 Ability to analyze, write, and edit academic and technical texts in English to solve professional and research tasks in mathematics and computer science</i></p>
3	Complexity and volume of the completed work		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-3 Ability to correctly, mathematically formulate and prove statements, formulate results, see the consequences of the results.</i></p> <p><i>PC-6 Ability to design and implement a complete software system with the use of already-made software modules and components</i></p> <p><i>PC-8 Ability to develop a mathematical model and use it for analysis of a proposed theoretical or applied problem</i></p> <p><i>PC-9 Ability to develop and implement, in the form of a software module, an algorithm for solving a proposed theoretical or applied problem based on a mathematical model.</i></p>

4	Quality of the composed text. Clear and structured presentation of ideas.		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-12 Ability to analyze, write, and edit academic and technical text in (official) Russian to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-13 Ability to analyze, write, and edit academic and technical texts in English to solve professional and research tasks in mathematics and computer science</i></p> <p><i>PC-14 Ability to search for and process information in the sphere of applied mathematics and informatics, including using computer information systems</i></p> <p><i>PC-15 Ability to competently and in a well-reasoned manner present the results of your research and professional activities, including using contemporary information technology resources</i></p>
5	Quality of the code		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-5 Ability to write, design, debug, and optimize source code.</i></p>
6	Adherence to the planned work schedule, meeting deadlines for completing the main stages of the term paper, interaction with the term paper supervisor		<p><i>When evaluating, pay attention to the degree to which the following competencies are demonstrated (level of mastery):</i></p> <p><i>PC-10 Ability to conduct written and oral communication in (official) Russian within the framework of professional and research communications, both interpersonal and as part of a group</i></p> <p><i>PC-17 Ability to make socially responsible decisions in atypical professional situations</i></p> <p><i>PC-18 Ability to demonstrate creativity, initiative, and perseverance in achieving goals (both professional and personal)</i></p>
FINAL SCORE			<p><i>General commentary on the work. <u>This commentary is mandatory!</u></i></p> <p><i><u>Feedbacks with only scores WILL NOT be accepted.</u></i></p> <p><i><u>The final grade is not calculated as the arithmetic mean of the criteria, but on the basis of the overall evaluation of the work, taking into account the criteria. In the absence of clearly marked strengths and weaknesses, it is recommended to give a score of 7.</u></i></p> <p><i><u>When the grade is higher or lower for respective points, the weaknesses or strengths in relation to the criteria must be specified.</u></i></p>

Academic Supervisor:/
Reviewer:

Position, academic degree, department/ place of work

Full name

Signature

Appendix 8. Methodological Guidelines for Term Papers and Theses

1. Topic Selection

1.1. Types of Topics

The selection of the subject and topic of the work must be approached very carefully and responsibly, especially if the topic is original (i.e. not from the suggested list). The topic should not be too broad and should focus on the research purpose.

The term paper/thesis can be completed in two main formats: a research or software project. A research project can take the form of theoretical analysis (formulating and proving new claims and theorems), comparative analysis of existing methods for solving a particular type of problem, or the development of new/improvement of existing methods for solving applied problems. A software project normally takes the form of developing or refining some kind of software product.

Depending on the chosen format/topic, particular attention should be paid to different aspects of the project during the completion process.

Main emphasis of a research project (analytical work)

1. Description of the subject area and analyzed products/solutions/technologies.
2. Identification of the tasks of analysis/testing/comparison.
4. Description of the chosen analytical methods and a justification of the choice.
5. Description of the tools used for testing and a justification of the choice.
6. Detailed and high-quality presentation of the results of the analysis.
7. Discussion of the results of the analysis, identification of strengths and weaknesses, formulation of recommendations.

Main emphasis of a research project (theoretical results/new methods)

1. Review of previous achievements with an evaluation of the scientific contribution.
2. Detailed description of the mathematical models, methods, and algorithms.
3. Formulation and proof of theoretical results or a description of the proposed methods for solving the problem.
4. Theoretical assessment of the proposed solution to the problem.
5. Computational experiments for the empirical analysis of the proposed solutions and comparison with existing analogues.

Main emphasis of a software project

1. A justification of the significance of the proposed system or system prototype.
2. A detailed, formalized description of the system (overall architecture, classes of the structure and their interfaces, volume characteristics, etc.)
3. Description of the system from a user's point of view.
4. Validation of the chosen solutions, including on the basis of experimental analysis of the computational complexity.
6. The system's correlation with well-known analogues in terms of functionality, effectiveness, and usability.
7. Ability to demonstrate the system in operate, as well as the ready-to-use documentation.

1.2. Title

The title should, as accurately as possible, describe the term paper/thesis topic and methods, while indicating those that are actually discussed in the project. Understandably, to do this, the title must be quite extensive, but it should not exceed 11 words. The best method for naming is an iterative adjustment in accordance with the extent of the understanding of the subject area and the essence of the work.

2. Organization of the Report

2.1. Text Structure

The following report structure is recommended:

1. Title pages (in the same language as the project text)
2. Table of contents
3. Abstract (up to 2000 characters)
4. List of key words: 5-10 words or phrases that characterize the contents of the term paper or thesis (in the same language as the project text).
5. Introduction. Should provide a description of the subject area, the research's relevance, the significance of the work, the research goals and objectives, an informal and formal statement of the research question and main results, and the structure of the work.
6. Literature review. A short description and assessment of the relevant works. For a research project: position your work in relation to other contemporary works (for example: the proposed method is more effective than work [1] because an additional case is studied in this work that is not examined in work [2], etc.). For a software project: a description of similar software solutions and why it is not possible to use them to solve the set task. The review ends with a "Conclusions" section in which, based on the results of the review, conclusions are made about the next steps needed for the thesis/term paper.
7. Chapters (usually 2-5). For example, a work that proposes a new method may contain the following chapters: a description of the proposed method, a theoretical analysis of the method, experimental research, and a comparison to analogues. A work analyzing the particular features of applying a specific method to various research questions may contain the following chapters: a description of the method, experimental analysis of applying the method to question 1 in comparison to analogues, the same for question 2, etc. Each chapter should end with a "Conclusions and Results" section. This section contains a short description of the results of the chapter and smoothly transitions to the next chapter.
8. Conclusion. Enumeration and assessment of the results and prospects for further study.
9. Bibliography (list of sources) formatted according to the Russian National Standard 7.0.5-2008.
10. Appendices (if needed). Appendices must be numbered and listed within the contents of the term paper or thesis. Standard appendices: a terminology list (glossary) of the subject area; list of abbreviations, initial experimental data; experimental protocols; additional visual images generated by software applications. It is not recommended to include the source code for all programs developed while completing the thesis since it is seen as a superficial way to increase

the volume of the work. You may include key code fragments if they are necessary to demonstrate original solutions or the special features of the work.

2.2. Text Size and Style

The thesis/term paper report must be written in a scientific style. The report should describe in detail all project components listed in the main body of the Guidelines in p. 2.1 *Term Paper and Thesis Format*.

The total length of the work depends on the classification of the topic. Works related to theoretical computer science that formulate and prove new theoretical results may be between 10-15 pages. The standard length of an individual term paper (both research and programming) is approximately 20 pages (20,000 characters), of a thesis—approximately 30 pages (30,000 symbols). The volume of a group term paper is larger than the volume of an individual term paper in proportion to the number of participants.

2.3. Basic Formatting Requirements

No.	Field	Requirements
1	Font	Times New Roman, 14
2	Indents	Line spacing – 1.5 . Indents at the start of paragraphs are mandatory, standard indentation– 1 cm . <i>Justify</i> the text.
3	Page	Left margin is 2.5 cm, the remaining margins are 1.5 cm. The pages are <i>numbered</i> except for the first (title) page, which is not.
4	Structure	All components (sections, figures, tables, sources, footnotes) <i>must</i> be numbered. The numbering of items within chapters is done by indicating the chapter before a period (for example, 2.3 is the third item of a given type in the 2 nd chapter).
5	Section headers	Section headings should not contain abbreviations (except for generally accepted ones). This allows you to read the contents easily. The font size of section headers is between 16-18.
6	Figures, tables, etc.	<p>Figures and tables are center aligned. Captions are written <i>below</i> and center aligned for figures, for tables—<i>above</i> and center aligned. If the figure/table takes up more than one page, then the captions are <i>repeated</i> on each page with “Continued” added to the caption text. Captions should be informative and briefly explain the contents of the figure/table without the need to read the corresponding part of the main text.</p> <p>Example of a figure:</p> <p style="text-align: center;">< Figure></p> <p style="text-align: center;">Fig. 2.3. Example of a visual of the data results</p> <p>Table Example:</p> <p style="text-align: center;">Table 2.3. Volume characteristics of programming unit</p> <p style="text-align: center;"><Table></p> <p>In this example, 2 is the chapter number, 3 – the number of the table/figure in</p>

		the second chapter
7	Formulas	Mathematical formulas do not have to be extracted from the text. If they are separated, then they should be <i>center</i> aligned and their numbers are aligned to the <i>right</i> . If there are new symbols in the formula (when compared with previous formulas in <i>the same section</i>), then all these symbols must be explained before or immediately after the formula.
8	References	References are formatted according to Russian National Standard 7.0.5-2008. When using common word processors (<i>Word, TeX</i>), it is recommended to use their mechanisms for cross-references, citations, etc.
9	Binding	The printed thesis must have a binding, for example, a plastic casing or a coil.

3. Contents of the Work

3.2. Writing the Introduction

The length of the introduction is usually between 2-4 pages. The project's research question and the achieved results must be clearly understood from the introduction. The main part of the introduction is a brief summary of the work, which should explain:

1. the nature and history of the subject area's development, the relevance of the chosen topic, the presence of related work in this subject area;
2. project goals and objectives;
3. the novelty, theoretical significance, and practical application of the results.

End the introduction with a description of the work's structure by chapter.

3.3. Describing the Results

Do not forget that the results of the work will be evaluated on the basis of their relevance, novelty, theoretical significance, practical application, validity and accuracy, as well as completeness. Therefore, you must provide an argument for all of your statements. You must also provide descriptions of all approaches, methods, and means used to:

1. receive the source data;
2. conduct the experiments;
3. verify the results;
4. analyze the results in order to formulate generalizations and conclusions;
5. compare results with work in the same field.

Remember to specify the volume characteristics of the work (sample size, database volume, time spent on conducting the experiments, number of analyzed variants, number of lines of code and code size in kilobytes, etc.).

3.4. Why do I Need a Conclusion?

In the conclusion, briefly summarize the most important results of the work, more fully substantiate the solutions to the questions established in the introduction, and define *practical* areas for further research/development. If any questions were not answered, you must specify why (“a negative result is also a result”).

3.5. Emphasis on Author Contribution

One of the favorite questions of SEB members is “And what did you personally do?” Accordingly, highlighting the author’s contribution is very important when describing any results. Be especially careful of the use of the word “original” which, in the context of the thesis text, means “*not* previously studied/in existence”.

3.6. Developing the Text

You should not think that you will write a good scientific text on the first attempt. It is generally accepted that the first text about a new subject area will undergo no fewer than 7 revisions. With that in mind, the first versions should be focused on gathering and composing the material, the subsequent versions on arranging, refining, and aligning the material, and the last on removing spelling, grammatical, and stylistic errors.

Pay special attention to:

1. the structure of the text;
2. the completeness of the information;
3. presentation of conclusions on the chapters and overall results of the work;
4. a correctly-formulated introduction and correct use of terms (for example, it is best to keep the name of one entity consistent throughout the entire text)—compiling a glossary greatly helps with this;
5. correct use of abbreviations;
6. format of citations and other references;
7. formula comments (specifying all symbols/signs)

The active use of *terms* is one of the differences between scientific/technical texts and literary texts. A **term** (from the Latin *terminus*, meaning boundary or limit) is a word or phrase that serves as a unique identifier of a concept or entity within a text or subject area. When using a previously developed terminological system, you must clearly reference the source. When introducing a new term, you must, whenever possible, provide a functional definition. After the introduction of a term, you cannot, under any circumstances, substitute it with a synonym.

4. Presentation and Defence of Thesis/Term Paper

4.1. Presentation

The format of the presentation is similar to the format of the thesis/term paper text, but involves a much shorter description of the material:

1. Title slide specifying the project name and type (research/software), the student’s full name, the full name of the supervisor/advisor/facilitator)
2. A clear statement of the research question, the relevance, and significance
3. A short description and overview of relevant work
4. The main section with a description of the proposed methods/research conducted, etc.

5. Conclusion: the presentation must include a slide that clearly states the points that must be defended (the student's primary conclusion)

The main goal of the presentation is to present what the student did over the course of the year. Accordingly, pay particular attention to point 4, and point 3 should be very brief.

The presentation can be completed in Russian or English, but mixing languages is not permitted.

The defence presentation for group term papers must contain an overall introduction with a description of the project as a whole and the distribution of tasks for each member by section, as well as an overall conclusion with a clear statement of the contribution of each group member.

4.2. Oral Presentation

The time limits for the presentation should be adhered to strictly (both the minimum and the maximum). For a presentation that's too long, the board will simply not be able to provide you with more time and will interrupt your presentation. For a presentation that's too short, the board will have questions about the contents and volume of the work, which may ultimately affect the grade. You should practise the presentation in advance, because you may find it challenging to explain a year's worth of work in such a short space of time.

When defending a group term paper, one member of the group should provide a short introduction at the beginning and then each member should describe his/her contribution; do not change the speaker more than necessary as it will complicate the committee's understanding of who did what.

4.3. Evaluation of the Term Paper/Thesis

The following factors influence the term paper/thesis score:

1. The opinion of the committee/board members on the work's contents and its defence, including the quality of the report and the answers to the committee/board members' questions and the reviewer's notes (in the case of a thesis).
2. The term paper/thesis supervisor's opinion
3. In the case of a thesis, the reviewer's opinion of the thesis as a whole, factoring in the degree of validity of the conclusions and recommendations, their novelty and practical significance.
4. The degree of compliance with the formal requirements for the term paper/thesis.

Recommended Reading

1. **Кузин Ф.А.** Кандидатская диссертация. Методика написания, правила оформления и порядок защиты. Практическое пособие для аспирантов и соискателей ученой степени. – М. : Ось-89, 2008. – 224 с.

(Одна из наиболее академических книг о написании диссертации. Практически весь материал можно использовать при написании ВКР)

2. **Колесникова Н.И.** От конспекта к диссертации: Учебное пособие по развитию навыков письменной речи. – М. : Флинта: Наука, 2009. – 288 с.

(Неплохое пособие по улучшению письменной академической речи)

3. **Радаев В.В.** Как организовать и представить исследовательский проект (75 простых правил). – М. : ГУ-ВШЭ, 2001. – 202 с.

Internet Sources:

5. <https://www.hse.ru/docs/153240957.html>
(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)
6. <https://www.hse.ru/docs/182661271.html>
(Regulations on Checking Student Papers for Plagiarism and the Publication of Bachelor's, Specialist and Master's Theses on the HSE Corporate Website)
7. <http://protect.gost.ru/document.aspx?control=7&id=129865> (ГОСТ Р 7.1-2003)
8. <http://protect.gost.ru/document.aspx?control=7&id=173511> (ГОСТ Р 7.0.5-2008)
9. <http://www.philosoft.ru/wordtips.zhtml#wordtips-char-styles>
(*Microsoft Word* для технического писателя, материал устарел, но всё равно исключительно полезен)
10. <http://www.tug.org/interest.html>
(*TeX* Resources on the Web – каталог ссылок на ресурсы, посвящённые *TeX*).
11. <http://www.methodolog.ru/books.htm>
(сайт «Методология» А.М. и Д.А. Новиковых)