GUIDELINES FOR THE PREPARATION, ASSESSMENT, DEFENSE AND PUBLICATION OF TERM PAPERS (COURSEWORK) AND MASTER'S THESES FOR THE MASTER'S PROGRAMME «SYSTEM AND SOFTWARE ENGINEERING» IN THE FIELD OF STUDIES 09.04.04 «SOFTWARE ENGINEERING»

1. GENERAL PROVISIONS

1.1. The Guidelines for the preparation, assessment, defense and publication of term papers and Master's theses for the education Programme «System and Software Engineering» in the field of studies 09.04.04 «Software Engineering» (hereinafter referred to as *Guidelines*) are prepared on the basis of and in accordance with the «Provision on the Coursework and Thesis of Students Enrolled in Bachelor's Degree Programs, Specialty Programs and Master's Degree Programs at the Higher School of Economics» (Appendix to the HSE Directive No. 6.18.1-01/2903-05 dated March 29th, 2016; approved by the Academic Council of the HSE, Minutes # 3 dated 26.02.2016),

1.2. The Guidelines lay the grounds for recommended procedure relating to the preparation of Coursework and Thesis, contain requirements for the structure, content, scope, design, formats of the Coursework/Thesis, time limits for different stages of the Coursework/Thesis (project) activity, criteria for assessing the Coursework/Thesis, project defense procedure, guidance for reviewer assignment and requirements for Thesis reviewing,

1.3. Both Coursework (project that is being implemented during the 1st year of studies) report and MS Thesis (Graduation project that is being implemented during the 2nd year of studies) are prepared and presented <u>in English</u> (it is a mandatory requirement for the English-language Programme),

1.4. Compliance with these Guidelines is a must for all students of the Master's degree Programme «System and Software Engineering» (hereinafter referred to as *MDP*) regarding the preparation, defense and publication of the Coursework (report) and Thesis (graduation work).

2. GENERAL REQUIREMENTS FOR THE COURSEWORK (PROJECT)

2.1. Coursework (project) can be carried out in the form of (academic) *research work* (рус. Исследовательская работа) or *course project* (applied, product-oriented project) – following Appendix to HSE Directive No. 6.18.1-01/2903-05 dated March 29th, 2016 («Regulations for Term Papers and Theses Prepared by Students… at the NRU HSE»), the naming "Term paper" is used, and it can be of two types, namely, they are *research term paper* and *term project* (see clauses 2.4.1 and 2.4.2 of the aforesaid document). These types fully comply with the names – (academic) research work and course project – used in item 2.1 of the present document, retaining the semantic content of the terms used.

As a rule, *research work* includes, but is not limited to a review and well-founded assessment of previous works (publications) on similar topic(s), thorough analysis of stakeholder requirements

as applied to the problem at hand, development and/or detailed description of a mathematical or other (formal) model(s) and algorithms, theoretical assessment of the complexity of the algorithms under consideration for solving a given problem, formal proof of statements concerning the properties of a model or other structures in use, experimental verification of models adequacy (correctness, completeness, accuracy, etc.), experimental (empirical) analysis of the computational complexity of the proposed solutions, demonstrating the feasibility of the proposed approaches (models, algorithms) in the form of prototype (full-fledged) programs, reasoning behind decisions made, etc.

Course project as applied, product-oriented project, encompasses engineering and technology and is aimed primarily at practical application (development of the software or hardware-software system). Generally, such project covers, but is not limited to the justification of the significance of the applied problem, detailed review and comparative analysis of existing solutions, formal description and justification of the proposed solution (general architecture, structure of classes and their relations, etc.), description of the system or technology stack that imperatively implies the justification of the feasibility of selected solutions, comparison of the proposed system (engineered technological solution) with well-known counterparts in terms of functionality, efficiency and usability, demonstration of the developed system, its documentation, etc.,

2.2. Students may prepare a coursework (project) in the form of a *research work*, but at the same time, the program (software component) must be a mandatory part of such work, or in the form of a *course project* implemented in any programming language(s) and based on a required (as a result of thorough conducted analysis) technology stack,

2.3. Considering the specifics of the field of studies (software engineering) and further employment of the program's graduates, the Coursework can be performed by students in *small groups* (the issue is necessarily discussed with both the Programme's Academic supervisor and supervisor of the project).

3. MAIN STAGES OF PREPARATION OF THE COURSEWORK (PROJECT)

3.1. The terms and conditions that relate to the proposal and approval of the Coursework are determined in accordance with the Regulations,

3.2. The topic of the Coursework is chosen by a student (or, a group of students, see item 2.2) in the first year of his/her studies. A list of offered topics is released not later than October 20th, and by November 20th as the latest (the preferable and highly recommended date is November 15th), a student must inform the Programme's academic supervisor and the Office of Studies (Programme Office) about the topic chosen, format of the Coursework (see item 2.1 above) and the full name of project's supervisor (mentor) to work with. A student has a right to propose his/her own topic (so-called *initiative topic*) for a possible discussion with interested would-be supervisor(s). As a general rule for HSE, *"topics may be proposed by departments, research subdivisions and separate members of the HSE academic staff whose research interests match the programme's field of study"*. A written application is made in the name of the Programme's Academic supervisor (Appendix 3),

3.3. Tentatively late November, students defend topics of their Coursework (with obligatory preparation of slides for presentation following pre-defined template) – such work is carried out within the framework of Research (Project) seminars of the 1st semester of the curriculum in agreement with the instructors conducting these seminars. Such 'defense' allows a student to better present the scope and details of the work to be done, to formulate (for further discussion with supervisor) possible questions and to understand the relevance of the stated topic to the content of the future work. Certain details related to the presentation and its content are discussed with students at the Project Seminar (Modules 1 and 2, 1st year of studies),

3.4. Not later than **1 (one) month** prior to the deadline for the submission of the final version of the Coursework's report (unified date for all students that is announced in advance), a student has a right, following the agreement with project's supervisor (mentor), to change **(a)** project's topic, **(b)** format of the Coursework (see item 2.1), as well as **(c)** project's supervisor (mentor) by submitting a filled in application form signed by a student, former project's supervisor and the new project's supervisor. In particular, such change may be due to the illness or a long-term supervisor's scientific trip. The application signed by the <u>former</u> supervisor, <u>new</u> supervisor and <u>student</u> himself (herself) is written in the name of the Programme's Academic supervisor and is handed over to the Office of Studies (Programme Office),

3.5. At the end of the academic year (Module 4, around the second half of June), all works (projects) performed by students are defended in front of the jury (*public defense*), i.e. the assessment of the work performed is not done solely by the project's supervisor (mentor), but by a board (jury) consisting of several people. The defense schedule is approved by the Programme Manager (Office of Studies) and brought to the students' attention no later than 2 (two) weeks before the defense starts,

3.6. The deadlines for all stages of the Coursework activities are provided in the Appendix 1.

4. SUPERVISION OF THE COURSEWORK (PROJECT)

4.1. As a rule, supervisor of the Coursework (project) is appointed from among faculty members (University as a whole is being considered) and researchers of the HSE. By the agreement with the Programme's Academic supervisor, a third-party employee may be appointed as a supervisor of the coursework (project). In such a case, a project's co-supervisor from among the faculty members is appointed to coordinate all stages of the student's work,

4.2. Obligations and rights of the supervisor are defined in paragraph 5.1 of the Regulations,

4.3. If a report is submitted after the deadline specified in the Appendix 1, the Coursework's supervisor has a right to assess the work with unsatisfactory grade without reviewing it,

4.4. Supervisor provides a filled in review form and assesses the quality of the Coursework, guided by the general criteria specified in the sample of the supervisor's review form. The review must be accompanied by brief comments that characterize the main advantages and disadvantages of the submitted Coursework (see Appendix 3). The filled in review form must be signed by the supervisor (mentor). Both text of the Coursework's report (including supplementary materials, if any) and the supervisor's review form (copy in the **.pdf** (Portable Document) format or a as an image) must be uploaded by a student to LMS (*a platform for online support of the educational process at the HSE*; designated folder is used as specified in advance by the Office of Studies / Programme Office).

5. COURSEWORK (PROJECT) CONTENT REQUIREMENTS

5.1. Preparation of a report that describes comprehensively student's activities as a part of the completed coursework is mandatory. As part of the Project Seminar (one of the courses in the 1st year curriculum), students prepare a *Project (Research) Proposal* (end of Module 2 – beginning of Module 3), which can be viewed as a basis (in terms of the general structure of the document) for the Coursework Report,

5.2. If the Coursework is done in the form of a *research work*, and the program (software part) is not its main result, a Report (in English) must be prepared; the following constituents of Report's (Project) structure can be recommended:

    (a) Title page,

(b) Abstract and the list of keywords (0.5-1.0 pages) – a brief description of the object of study, the purpose of the work, the method or methodology of the work, the results of the work, conclusion (the approbation of the work that covers publications, presentations at conferences, etc. can be briefly mentioned). Abstract is formed as a single paragraph text. The list of keywords follows the Abstract (a student should try to limit the list to five-seven keywords). A student must choose those keywords that will make others interested in the contents of the study (material covered by the Report). Keywords (phrases) must be separated with a semicolon symbol,

(c) Table of Contents,

(d) Introduction (up to 5-6 pages; pay attention to the fact this limitation is only indicative, as much depends on the type and specificities of the work being done) – it describes the relevance, background and objectives of the work, the subject and methods of research, the novelty and reliability of the results obtained, their theoretical significance and practical value). Personal motivation must be mentioned here as well – the Introduction section must provide a solid base for a reader to understand the background of the Coursework (Project) activity,

(e) Theoretical (Research) section (selection of methods, algorithms, approaches, models aimed at solving specified tasks, their presentation and required explanations),

(f) Results of experiments – description of the experiments conducted (test runs), analysis and evaluation of the results obtained, disadvantages (flaws) revealed, etc. The size and scope of this section depends on the type and specificities of the work,

(g) Substantive conclusion section and prospects for further research on the topic (implication of the research (Project's work)),

(h) Reference list,

(i) Appendices (optional) – they may contain supplementary, rather cumbersome to place in the main text, parts of the work (tables, graphs, results of test runs of program(s), etc.) that are referenced (mentioned), but not covered by the main text. The code of the program (software part) must be attached to the Report unconditionally, but it can be placed on a separate medium (e.g. memory stick), because the printed version (hardcopy) of the code can be very voluminous. Additionally, a link (operating one) can be provided to a cloud resource (repository) where the program is stored (see section 11 for more details),

5.3. If a Coursework is done in the form of a *course project*, the technical documentation must be prepared in accordance with International Standards *IEEE 829-2008* 'Standard for Software and System Test Documentation', *IEEE 29119-3:2013* 'Software and Systems Engineering Software testing Part 3: Test Documentation' (the present Standard was last reviewed and confirmed in the year of 2019), *IEEE 1063-2001* 'Standard for Software User Documentation' (reaffirmed in 2007), *IEEE 1016-2009* 'Systems Design - Software Design Descriptions' (revision of the IEEE Std 1016-1998),

5.4. The final versions of Coursework (Project) Report and presentation must be uploaded to LMS on (before) a date to be agreed upon by the representatives of Office of Studies (Programme Office). Corresponding information must be brought to the students' attention in advance. The presentation (slides/file in .pdf format) can be uploaded to LMS just *before* or just *after* the day of the work (project) defense,

5.5. The final Coursework (Project) Report must be also uploaded to the Anti-Plagiarism system (*Rus*. 'Antiplagiat') for inspection (audit); usually www.turnitin.com service is used for this purpose – all necessary details of this process are brought to the attention of students by the representatives of the Office of Studies.

6. COURSEWORK (PROJECT) ASSESSMENT (PUBLIC DEFENSE - REQUIREMENTS)

6.1. The works done by students of the Programme are subjects to mandatory public defense,

6.2. The public defense of Coursework is carried out in the Module 4 (June) of the academic year in accordance with the schedule approved in advance,

6.3. The following should be made available for the defense:

(a) a hardcopy of the final (ultimate) version of the Coursework signed by the student and supervisor, and approved by the Programme's Academic supervisor (this is a Technical documentation for the Coursework done in the form of a *course project*, or Coursework report, if it is carried out in the form of (academic) *research work*),

(b) a working application (executable code) for the Coursework done in the form of a *course project*; a program (source code and executable file) for the Coursework carried out in the form of (academic) *research work*,

(c) electronic copy of the final (ultimate) version of the Coursework (documentation or report),

(d) a filled in and signed supervisor's review form,

(e) a hardcopy of the standard registration form (statement) obtained from Anti-Plagiarism system (*Rus*. 'Antiplagiat'),

(f) presentation materials (copy of slides).

The text of the final (ultimate) version of the Coursework (Technical documentation or Coursework report) as well as presentation materials are both delivered in English. Supervisor's review can be submitted either in Russian or in English; the student shall speak in English (both presentation itself and answers to questions raised),

6.4. The defense of the Coursework carried out as a *group coursework* is done by each student (member of the group) individually. In his / her speech (presentation), a student tells clearly about the results obtained personally by him / her while working on a subsystem (part, component, etc.), making emphasis on the place of this subsystem within the entire software system presented,

6.5. For the public defense of the Coursework, the Academic Council forms a board (jury) from among the scientific and pedagogical staff of the Faculty of Computer Science (FCS) as well as employees of other departments of the National Research University Higher School of Economics and other higher education institutions, scientific organizations and companies. The structure (list of members) of the board (jury) is approved by the directive under the name of the Dean of FCS. The chairperson of the committee (jury) is appointed for each session by the Head of the School of Software Engineering,

6.6. The grade for the Coursework' (Project) presentation is specified by the board (jury) members – the grade given to a student is a subject to collegial discussion and decision. The assessment of the Coursework takes into account student's presentation, report and answers to questions, the quality of the program (software part), the quality and completeness of the conducted research, the quality of documentation / Coursework report, the review of the Coursework supervisor (the evaluation (grade) recommended by the project's supervisor (mentor) and his / her comments), the maturity level of formed competencies as provided by the Education Programme Standard and summarized in the corresponding matrix of competences (MC). The supervisor's recommended grade and corresponding comments are summarized in the completed (filled in) form – its template is shown in the Appendix 5.

The assessment of the Coursework is based by a simple majority vote of the board members. With an equal number of votes 'in favor' (*pro*) and 'against' (*con*), the chairperson of the Board shall have a decisive word. The assessment is provided on a 5-point and 10-point scales. When

the Coursework is defended by a group of students, a grade is given to each student (member of the group) separately. Based on the results of the discussion, the members of the Board shall fill in a standard record sheet to be handed over to the Office of Studies (Programme Office),

6.7. A student who has got a grade *'unsatisfactory'* (grade 0,1,2 or 3 out of 10) for the Coursework (Project) or who has not submitted a Coursework (Project) Report in time, i.e. before or at the specified deadline (it is set in advance) is considered to have academic failure that must be eliminated following the established manner. A student must consider the advanced comments (remarks) and refine the text of the Coursework report accordingly. However, the topic of the coursework (project) can be changed in accordance with the Order (Directive) by the Dean of the Faculty. The procedure for the reimplementation of the Coursework is regulated by the official document titled "Provision on the Organization of the Interim Attestation and Current Monitoring of Students' Progress at the HSE".

7. REQUIREMENTS FOR PUBLICATION AND STORAGE (DEPOSIT) OF THE COURSEWORK

7.1. Thy present Guidelines do not establish the requirements concerning the mandatory publication of the results of the Coursework (Project) done,

7.2. The Coursework (Project) Supervisor (mentor) and the Programme's Academic supervisor may recommend to publish the coursework's findings and results in the peer-reviewed domestic or international journal (present at the conference), upload the coursework' report to the HSE website and, as a potential option, to other online resource(s),

7.3. Original hardcopy and electronic form (link to it, viz. corresponding report) of each report are kept (remain valid) in the Office of Studies (Programme Office) for **2 (two) years** after the completion of the course of studies by a given student.

8. GENERAL REQUIREMENTS FOR THE THESIS (GRADUATION WORK)

8.1. The Thesis (Graduation MS work) project can be carried out by students in the form of *academic* (*pure*) research or in the form of project (*product-oriented*, *applied*) research – refer to clause 3.4 of the present Regulations. It must be emphasized that *academic* research relates to conceptual problem(s) that appear as a result of a lack of understanding of phenomenon(-na), it is carried out in order to improve this understanding, to answer questions raised and to obtain new knowledge about the structure, properties and behavior of the object (phenomenon(-na)) under study. In contrast, *product-oriented* (*applied*) research relates to problem(s) that do have practical consequences, it "concerns itself with the elaboration and application of the known" and is aimed at the product (that is engineered) at the end; see also clause 2.1 of the present Regulations and Section 3 ("General Requirements for a Thesis") of the Appendix to HSE Directive No. 6.18.1-01/1007-02 dated July 10th, 2015 («Regulations for Term Papers and Theses Prepared by Students… at the NRU HSE»),

8.2. The Thesis (Graduation project) can be performed by students in *small groups* – refer to the clause 2.2 for more explanations (reasons to allow both individual and group projects),

8.3. The Thesis (Graduation project) report must be written in English, no exceptions.

9. STAGES OF THE GRADUATION THESIS' PREPARATION

9.1. The main stages of the preparation of the Thesis (Graduation project) are set out in general form in the Appendix 2 of the present Regulations. The list of activities and corresponding deadlines concerning the preparation as well as defense stages of the Thesis (Graduation work) adopted by the Programme are provided in the Appendix 5,

9.2. In the perfect case, the subject of the Thesis is an extension of the Coursework topic (1st year of studies), which can be considered as a pre-project work by a student to be continued in the second year of study (clause 3.3 of the Regulations). By November 20th (the preferable and highly recommended date is November 10-15th), a student informs the Academic supervisor of the Programme and the Office of Studies (Programme Office) about the final topic and format (type) of the Thesis he / she plans to work on. A written statement is made in the name of the Academic supervisor of the Programme (see Appendix 4),

9.3. The topics of Graduation Theses are approved by the Programme's Academic supervisor after public defense of the chosen topics. The defense takes place in November-December (Module 2 of the academic year) at the meeting of the board (jury) consisting of scientific and pedagogical staff of the School of Software Engineering (SSE) with obligatory participation of member(s) of the Programme Academic Council. The Programme Manager proposes the structure of the board (list of jury members) and approves it with the Programme's Academic supervisor. In so doing, the presence of supervisors at the defense meeting(s) is highly desirable,

9.4. Not later than **2 (two) months** prior to the date of defense, the student has a right, following the agreement with the supervisor (mentor), to change the topic, format and/or supervisor of the Graduation Thesis (in particular, such change may be due to the illness or a long-term supervisor's scientific trip). This procedure is accomplished by submitting a written application to the Academic supervisor of the Programme; the application must be signed by the former supervisor (mentor) as well as the new Thesis's supervisor (mentor). Later on, all such changes are approved by a directive of the Dean of FCS,

9.5. The Thesis supervisor (mentor) and the Programme Office (Office of Studies) within the period from December to April of the 2nd academic year provide a student with necessary consulting assistance upon his / her request, including issues related to the Thesis public defense procedure, its organizational aspects,

9.6. Following General Regulations, the student submits the final (ultimate) version of the Thesis to the supervisor (mentor) no later than **3 (three) weeks** before the date of defense as announced by the Office of Studies (Programme Office),

9.7. The student submits the final (ultimate) version of the Thesis together with the filled in and signed by the supervisor (mentor) review form as well as the standard registration form (statement) issued by the Anti-Plagiarism system (*Rus.* 'Antiplagiat') to the Programme Office (Office of Studies) no later than **10 (ten) days** before the announced date of defense. The Office of Studies sends the final (ultimate) version of the Thesis to the reviewer in electronic (*softcopy*) or in paper form (*hardcopy*) depending on the prior agreement reached,

9.8. Other issues related to the preparation of the Thesis are governed by the HSE Regulations.

10. GRADUATION THESIS' SUPERVISION (MENTORING)

10.1. Matters related to the scientific (research) supervision of the Graduation Thesis are governed by the clause 5.2 of the HSE Regulations,

10.2. The (research) supervisor (mentor) of the Graduation Thesis is mainly appointed from amongst HSE employees having scientific degree, as well as practitioners (experience company's employees) with a background in the fields of IT or / and software engineering for, at least, **3 (three) years**,

10.3. Thesis supervisor (mentor) can also be an employee of the external organization, who meets the requirements of the clause 5.2.3 of the Regulations. For student, whose Thesis supervisor is not an employee of the HSE, a co-supervisor (tutor, consultant) can be appointed for the purpose of advising from amongst HSE employees (follow clause 5.4.2 of the Regulations) or individuals from third-party organizations whose professional activities and / or

scientific interests are related to the topic of Graduation Thesis (follow clause 5.2.5 of the Regulations),

10.4. Duties and rights of the supervisor of the Graduation Thesis are defined in clauses 5.2.12 and 5.2.13 of the Coursework (project) and Graduation Thesis Regulations,

10.5. After receiving the final (ultimate) version of the Thesis from the student, supervisor (mentor) of the work prepares a review (evaluation of the resultant Thesis) within **7 (seven) calendar days** that are allowed to fully complete this activity. The latter is guided by general criteria specified in the sample review; detailed comments on the Thesis are necessary, since they must present main advantages and disadvantages (strong and weak aspects) of the Thesis, theoretical and practical applicability (justifiability) of the Thesis results (Appendix 5, Thesis review form) and the maturity level of formed competencies as provided by the Education Programme Standard and summarized in the corresponding matrix of competences (see Appendix 6a – it presents a review form template for academic (*research*) study, and Appendix 6b, which corresponds to the review form template for the *project* (*product-oriented*) work). The Thesis supervisor hands over the filled in and signed review to the student for further uploading it to LMS. A copy of the review is also sent to the Programme Office (Office of Studies),

10.6. For work submitted after the deadline specified in these Guidelines (Appendix 2), the Thesis supervisor has a right to give an *unsatisfactory grade* without considering the content of the work.

11. CONTENT REQUIREMENTS FOR THE GRADUATION THESIS

11.1. If the Thesis has a project (*product-oriented*) format, the technical documentation comes down to the following constituents:

(a) Problem statement (including those nuances that are needed to crasp clearly specific features of the topic / project),
(b) Explanatory note (all necessary details related to topic background and relevance),
(c) Operator's guide (Manual),
(d) Program(s) and testing procedure,
(e) Text of the program(s) (to reduce the number of printed pages, can be placed on flash-drive, memory stick, CD, DVD; see also clause 11.10 for more details),
(f) Other accompanying documents (e.g. analogs review), if needed.

11.2. The technical documentation, the program(s) (source code, executable file) and the presentation of the Thesis must be uploaded as a single archive to the LMS in the project "Final Qualification Work" (please, note that it's a *provisional title* of the corresponding folder / project – normally it is confirmed by the Office of Studies (Programme Office) representatives towards the day of the Thesis defense),

11.3. The Thesis Report must be uploaded to the Anti-Plagiarism system (*Rus.* 'Antiplagiat') as it is explained by the representatives of the Office of Studies (Programme Office),

11.4. If a Coursework is done in the form of a *course project*, the technical documentation must be prepared in accordance with International Standards *IEEE 829-2008* 'Standard for Software and System Test Documentation', *IEEE 29119-3:2013* 'Software and Systems Engineering Software testing Part 3: Test Documentation' (the present Standard was last reviewed and confirmed in the year of 2019), *IEEE 1063-2001* 'Standard for Software User Documentation' (reaffirmed in 2007), *IEEE 1016-2009* 'Systems Design - Software Design Descriptions' (revision of the IEEE Std 1016-1998),

11.5. If the Graduation Thesis has a project (*product-oriented*) format, and it is done by a *group of students*, then the relevant documentation is prepared by each student separately for his / her part of the work (i.e. subsystem of the software system developed by the group). Besides, the

group provides 2 (two) additional documents – they are **(a)** design (requirements) specification for the entire project (software system), on the basis of which individual design specifications for the development of subsystems are defined, and **(b)** program(s) and testing procedure as applied to the entire system,

11.6. If the Thesis is performed in an academic (*research*) format, and the program (software part) is not its main result, the structure of the final Report prepared by student must cover the following sections:

(a) Title Page (follow Appendix 6 of the present document),
(b) Abstract (summary),
(c) Table of Contents (ToC),
(d) List of definitions, terms and abbreviations used in the text,
(e) Introduction
(f) The main part (3-5 sections (chapters); follow *Research seminar* (1st year) materials for more relevant information),
(g) Conclusion,
(h) List of used sources (references),
(i) Appendicies (including comments on software implementation of certain parts of the work done, schemes, diagrams, etc.),

11.7. The Thesis, applications (source code of the program(s), executable file, etc.) and presentation must be uploaded as a single archive to the LMS in the project "Final Qualification Work" (please, note that it's a *provisional title* of the corresponding folder / project – normally it is confirmed by the Office of Studies (Programme Office) representatives towards the day of the Thesis defense). Source code, executable file, etc. can be placed on flash-drive, memory stick, CD, DVD,

11.8. The Thesis Report must be uploaded to the Anti-Plagiarism system (*Rus.* 'Antiplagiat') as it is explained by the representatives of the Office of Studies,

11.9. The Thesis written in English (it is a must requirement for students of the Programme) is uploaded to LMS no later than **1 (one) working day** before the deadline specified for downloading the final version of the Thesis to check for plagiarism (www.turnitin.com service is usually used for this purpose). The result of the plagiarism checking is then entered manually (as of June 2019) by the Manager of the Programme to LMS – once it is done, the student can print the plagiarism check report (so-called standard registration form / statement),

11.10. Potentially, software implementation part of the Thesis (source code, the executable file(s), etc.) can be uploaded to, for example, GitHub, Google Drive or Yandex.Disk with assured granted open access to the board (jury) members, supervisor, co-supervisor (if any), representatives of Programme Office (Office of Studies); corresponding link to folder(s) must be specified in the text of the Thesis Report (or / and its Appendicies),

11.11. The Thesis is qualified as being in the status *'fully submitted' (completed)*, if the following documents are submitted in their final (not a subject for any further change) versions:

(a) Printed, signed (signatures of the Thesis supervisor, co-supervisor, if any, and the student are the MUST!) and bound final version of the Thesis text that was also uploaded to LMS,
(b) Abstract (in English),
(c) Annotation (in English) with the Thesis supervisor, co-supervisor, if any, and the student,
(d) Report concerning plagiarism verification, which also includes the student's consent on publishing a Thesis on the HSE portal (site),
(e) Filled in supervisor's review form with his/her signature.

11.12. In case of exceeding the permissible level of 20% of identified work-related borrowings that are shown as a result of the plagiarism test, the Thesis supervisor no later than **5 (five) working days** before the designated date of defense must give explanation regarding the originality of the submitted text and (possible) justified reasons behind the identified percentage of borrowings in student's work,

11.13. The text of the final (ultimate) hardcopy version of the Thesis as well as presentation materials are delivered in English (see also clause 11.9). Supervisor's review can be submitted either in Russian or in English; the student shall speak in English (both presentation itself and answers to questions raised).

12. REVIEW OF THE GRADUATION THESIS

12.1. Requirements for Thesis reviewers are defined in clause 4.4.6 of the HSE Regulations. By the April 25th, the Academic supervisor of the Programme approves the list of reviewers of the Theses from amongst the full-time researchers and teaching staff of the HSE, staff from other departments of the HSE, other higher education institutions, scientific and research organizations (institutions) as well as companies (domestic and foreign) being recognized leaders (experts) in field(s) relevant to topics of the Theses (focus of the Programme),

12.2. The directive (order) concerning the appointment of reviewers is issued under the name of the Dean of the Faculty of Computer Science (FCS) based on the recommendation of the Academic supervisor of the Programme no later than **1 (one) month** prior to the scheduled date of Thesis defense,

12.3. The representatives of the Programme Office (Office of Studies) send a Thesis for reviewing no later than **3 (three) calendar days** after its submission. The reviewer prepares and submits to the Office of Studies a signed review form on the Thesis no later than **3 (three) days** before the announced date of Thesis defense; the template of the review form is shown in the Appendix 7,

12.4. The reviewer (see clause 12.3) should analyze main points of the Thesis under consideration, the availability of own viewpoint on the work done / design solution(s), the ability to use methods (approaches) of scientific research / design, the strength (validity) of the conclusions drawn and recommendations provided / relevance of the means of achieving the results (solutions), their novelty, theoretical and practical applicability (justifiability) of the Thesis results and the maturity level of formed competencies as provided by the Education Programme Standard and summarized in the corresponding matrix of competences. The list of respective competences defined in the competence matrix of the Programme is given in the Appendix 9; the reviewer feedback form is provided in the Appendix 8,

12.5. The Programme Office (Office of Studies) makes student aware of the content of the review obtained no later than **2 (two) calendar day** prior to the date of Thesis defense.

13. PUBLIC GRADUATION THESIS DEFENSE REQUIREMENTS

13.1. Thesis written by students of the Programme is a subject for mandatory public (in front of the *State Examination Commission* / Jury) defense. The order and procedure of defense are governed by the HSE Regulations concerning the State Final Certification of HSE graduates enacted by the Directive of the HSE Rector No. 6.18.1-01/2004-08 dated 20.04.2017,

13.2. The public defense of the Thesis takes place in the end of 4th module of the academic year according to the approved schedule,

13.3. For the public defense of the Thesis, the State Examination Commission (SEC) is formed in accordance with the established procedure,

13.4. The defense procedure entails the presentation of the student (up to 20 minutes), questions raised by SEC members and student's answers to those questions, the final student's speech that embraces answers to the comments and remarks of the reviewer and SEC members. At the defense of the Thesis, the student shall speak in English only. The presence of the scientific (research) supervisor and the reviewer at the defense of the Thesis is highly desirable, although it is not compulsory. It should be noted that if the supervisor of student's Thesis is a member of SEC that examines the work of this student, he or she does not participate in the voting on that work,

13.5. The student has a right to use corresponding electronic aids (e.g. notebook / desktop computer, mobile devices, projector) that may be used to demonstrate the program (software part of the completed Thesis),

13.6. The defense of the Thesis carried out as a *group* work is done by each student (member of the group) individually. In his / her speech (presentation), a student tells clearly about the results obtained personally by him / her while working on a subsystem (part, component, etc.), making emphasis on the place of this subsystem within the entire software system presented,

13.7. As a result of the discussion, the members of SEC (for the Thesis defense) shall fill in the Minutes (Protocol) of the SEC meeting. The SEC assessment (grading) is based on a simple majority of votes of SEC members who are present at the defense. In the assessment process the maturity level of formed competencies as provided by the Education Programme Standard and summarized in the corresponding matrix of competences is taken into consideration. The competencies of the student are assessed as *fully formed*, *partially formed* or *not formed*. The respective assessment is accounted as a *'SEC decision'* in the Minutes (Protocol) of the SEC meeting,

13.8. The grading is based on a 10-point scale; the final grade is a rounded (arithmetic rounding takes place) averaging the opinions of SEC members; the grade is represented on both 10- and 5-point scales. When performing a groupwork, the grade is given to each student (member of the group) separately. In case of equal number of votes 'in favour' (*pro*) and 'against' (*con*) the work presented, the chairperson of the Examination Commission has *a casting vote*,

13.9. The results of the Thesis defense may be declared invalid by the SEC chairperson in case of discovered violation(s) of the State final certification procedure.

14. STUDENT'S RIGHT TO APPEAL ON THE RESULTS OF THE THESIS DEFENSE

14.1. An appeal (application form) may be submitted by a student personally to the Programme Office (Office of Studies) no later than the **next business day** after the announcement of grades (results of examination),

14.2. The reason for filling in an appeal can be related only to violation of the prescribed (established) procedure concerning the defense of the Thesis, but not to the result (grade obtained) per se. The procedure for consideration of appeals is consistent with the Section 4 of Regulations on the State Supervisory Board of the HSE,

14.3. The decision of the Appeal commission is considered as ultimate one and is not a subject to revision under no circumstances.

15. REQUIREMENTS FOR THE PUBLICATION AND STORAGE OF THE THESIS

15.1. The Programme fully complies with the requirements established in HSE at the present time and/or which (requirements) may be set forth in HSE in the future regarding public accessibility of the Thesis work(s),

15.2. The State Examination Commission (SEC) may recommend the publication of the results of Thesis in academic and technical journals (magazines, reports, etc.), the publication of annotations (summary) and full texts of Thesis on the HSE portal and other Internet resources,

15.3. Both *hardcopy* and *softcopy* of the Thesis defended are stored at the Programme Office (Office of Studies) for **5 (five) years** after the student's completion of studies, and then they are deposited in the HSE Archive for storage.

APPENDIX 1

STAGES AND DEADLINES FOR SELECTION AND FINALIZATION OF TERM PAPER (COURSEWORK) TOPICS

No	*Stage*	*Responsible Party*	*Deadlines*
1.	**Collection of proposed topics** for term programme's website	Departments (Schools) of the HSE / Office of Studies (Programme Office)	From **September 10th** to **October 1st** of the ongoing academic year. Information must be handed over to the Programme Academic supervisor **within 2 business days** after October 1st
2.	**Review of the proposed topics** by the Programme's authorities	Academic supervisor of the Programme and Academic Council / Programme Office (Office of Studies)	**Within 5-7 business days** after receiving the information from the Programme Office (Office of Studies); after review, the information is passed back to the Programme Office
3.	**Notifying** departments (schools) and research subdivisions of approved term paper/thesis topics	Programme Office (Office of Studies)	**Within 1 business day** from the Programme Office (Office of Studies) receiving the Academic Council's resolution on the list of the proposed topics
4.	**Further discussions** of term paper/thesis topics, finalization of the list of topics to be offered to students	Departments (Schools) and research subdivisions / Academic Supervisor / Programme Office	Departments and research subdivisions may discuss reasons for exclusion of their topics **within 3 business days** after receiving the notification from the Programme Office. Following such discussions, the Academic Supervisor may return some topics on the list
5.	**Publication** of data on topics and supervisors, the Guidelines and deadlines on the programme's website	Programme Office / Academic supervisor of the Programme	**No later than October 15th** of the ongoing academic year
6.	**Topic proposals** by students	Students / Departments / Academic supervisor of the Programme	**No later than November 10th** of the ongoing academic year

7.	**Review** of topics proposed by students	Students / Academic supervisor of the Programme / Academic Council	Decision on whether to approve topics proposed by students must be taken **no later than November 15th** of the ongoing academic year
8.	**Choosing** coursework (term paper) topics by students	Students	**No later than November 20th** of the ongoing academic year
9.	Assigning term paper (coursework) topics by a **Directive**, and **notifying supervisors** (mentors)	Programme Office (Office of Studies) / Academic supervisor of the Programme / Academic Council / Dean	The Academic Council must assign topics and supervisors **within 5 business days** after their selection (i.e. after November 20th). The directive is issued **no later than December 15th** of the ongoing academic year
10.	**Changing** or revising term paper **(coursework)** and its authorization by the Dean's directive	Programme Office (Office of Studies) / Academic Supervisor of the Programme / Students / Dean	No later than **1 (one) calendar month** before the official deadline for final submission of the term paper/thesis to the Programme Office (Office of Studies)
11.	**Approval** of the **coursework** defense schedule	Manager of the Programme (Office of Studies)	No later than **2 (two) weeks** before the specified date of defense
12.	**Submitting** the final (ultimate) version of the **coursework report** to the supervisor	A student (a group of students, if it is a groupwork)	No later than **5 (five) days** before the specified date of defense
13.	**Uploading** the text of the **coursework report** to Anti-Plagiarism system (*Rus.* 'Antiplagiat')	A student (a group of students, if it is a groupwork)	No later than **2 (two) days** before the specified date of defense
14.	The **supervisor's review** (filled in and signed)	Supervisor (mentor) of the coursework	No later than **1 (one) day** before the specified date of defense
15.	**Submission** of the final (ultimate) and bound version of **coursework report** with the **supervisor's review** (filled in and signed) and printed (*hardcopy*) **"Antiplagiarism" standard check report** (registration form / statement) to Programme Office (Office of Studies)	A student (a group of students, if it is a groupwork) / Supervisor (mentor) of the coursework / Office of Studies (Programme Office)	No later than **1 (one) day** before the specified date of defense

16.	The **public defense** of the coursework	A student (a group of students, if it is a groupwork) / Commission (Jury) / Supervisor (mentor) of the coursework	According to the approved in advance schedule of defenses

APPROVED

« ____ » _____ 202__

Academic supervisor of the Programme
«System and Software Engineering»

_____

APPROVED

« ____ » _____ 202__

Head of the School / Department

_____

_____

TO the Academic supervisor of the Programme «System and Software Engineering»

FROM

_____

_____

(Name, surname - *legibly*)

the student of the (*first* / *second*) year of studies;

group # _____
Programme «System and Software Engineering», Faculty of Computer Science

Phone number: _____

E-mail: _____

Application

Herein, I would like to request the *approval of the topic* of the coursework

«_____

_____

_____»

(title of the topic in **English**)

{ First / Second } year of studies [underline required option] and *to appoint*

_____

(academic degree, position, School / Department, Faculty, Name and Surname of the supervisor)

_____

(academic degree, position, School / Department, Faculty, Name and Surname of the supervisor)

as my *coursework supervisor* (mentor).

_____

« ___ » _____ 202 __

_____

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Moscow 2020

**RUSSIAN FEDERATION GOVERNMENT
NATIONAL RESEARCH UNIVERSITY – HIGHER SCHOOL OF ECONOMICS**

Faculty of Computer Science
School of Software Engineering

Review of scientific supervisor for the coursework

of the student (group # _____) of the Programme "System and Software Engineering"

_____ ,
Name, Surname of the student

Topic of the coursework: _____
_____
_____
_____

#	Evaluation criteria	Grade according to supervisor's opinion (out of 10)
1.	Clarity and correctness of the formulation of goals and tasks of the work / Achievement of the intended goal and tasks of the work	
2.	The completeness of information sources used in the work (books, articles, electronic resources of the library of the National Research University Higher School of Economics, Internet resources, etc.)	
3.	Complexity and completeness of the research / experiment (study)	

Comments and Remarks (it is **mandatory** to be filled in by the supervisor):

_____
_____
_____
_____

_____
_____
_____
_____
_____
_____
_____

Final supervisor's evaluation (grade): _____ **out of 10** | verbal grade: _____

Supervisor of the work: _____ / signature /

_____
Date (DD.MM.YY)   (Name, Surname; academic degree, position, department / place of work)

Supervisor's review for the coursework / Thesis (project)
MASTER'S PROGRAMME «SYSTEM AND SOFTWARE ENGINEERING»

Full name of the student _____

Year of Studies _____

Faculty _____

Title of the Work:

« _____

_____

_____ »

#	Evaluation criteria	Grade according to supervisor's opinion (out of 10)
1.	The content of the coursework corresponds to its title	
2.	Aims and objectives stated in the coursework have been achieved	
3.	Originality and novelty of the coursework / Thesis	
4.	Degree of independence of the student during research for coursework	
5.	Formatting and composition of the coursework (report)	
	Final grade[**] for the course work, that appears in the academic transcript of the student	

Comments and remarks (it is **mandatory** to be filled in by the supervisor):

_____
_____
_____
_____
_____

_____
_____
_____
_____
_____

Supervisor   _____
/signature/   _____
(Full name, Degree, title, Department (place of work))

Date   _____

** The final grade is the average of the five grades according to the evaluation criteria of the coursework

SAMPLE OF THE TITLE PAGE OF THE COURSEWORK / MASTER'S THESIS (PROJECT)

** **"National Research University "High School of Economics"**
** **Faculty of Computer Science**
MASTER'S PROGRAMME «SYSTEM AND SOFTWARE ENGINEERING»

** **COURSEWORK / MASTER'S THESIS (PROJECT)**
topic

_____
<Subject>

** **Student** _____
<Full name>

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

Co-supervisor (consultant):

Moscow 2020