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**NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS**

**Faculty of Computer Science**

**Centre for Internships, Project Work and Entrepreneurship (CIPE)**

**Guidelines for Preparing, Defending, Assessing and Publishing Software Projects by Students in the “Data Science and Business Analytics”**

**Bachelor’s Programme**

 **(Educational Standard 01.03.02 “Applied Mathematics and Information Science”)**

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# Terms and Abbreviations

**IC** – student’s individual curriculum

**AS** – approval sheet in software documentation

**HSE University, the University** – National Research University Higher School of Economics

**Academic staff** – academic staff members

**DP** – programme of higher education / degree programme

**HSE University** – HSE University independent standard of higher education;

**DS** – ‘Data Science and Business Analytics’ Bachelor’s programme

**SW** – software

**Faculty** – faculty staff

**PS** - programming system

**UDC** - Universal Decimal Classification

**Programme office** – study support office for the Faculty of Computer Science Bachelor’s programme

**FSS ES -** federal state standards of higher education

**FCS** – HSE University Faculty of Computer Science

**CIPE** – Centre for Internships, Project Work and Entrepreneurship of the Faculty of Computer Science

# General Provisions

* 1. These Guidelines have been drawn up in line with Regulations on Practical Training of Students under Core Bachelor’s, Specialist and Master’s Programmes at HSE University, confirmed by HSE University Academic Council Minutes No. 06, dated June 17, 2021, with amendments approved by HSE University Academic Council Minutes No. 11, dated October 29, 2021, and put into effect as per HSE University Directive No. 6.18.1-01/130721-7, dated July 13, 2021 (hereinafter the “Regulations”), as well as HSE University’s internal bylaws regulating the organization of interim examinations and ongoing assessment of student performance.
	2. These Guidelines specify the timeframes, as well as adjust and augment the criteria for the preparation, defense, assessment and publication of software projects (hereinafter “projects”) carried out by students in the Bachelor’s programme “Data Science and Business Analytics” (hereinafter “DS”), implemented by the Faculty of Computer Science (hereinafter the “FCS”), corresponding to HSE University’s internal bylaws.
	3. These Guidelines and the Regulations, as well as the methodological instructions of the degree programme, complement and further clarify one another. If any contradictions are identified between provisions thereof, a decision shall be made by the head of the CIPE with the approval of the programme’s academic supervisor and manager.
	4. Software projects are included in the curriculum of the second year of the DS programme in line with the HSE University ES in the field 01.03.02 “Applied Mathematics and Information Science”. Software projects must also be included in the individual curricula (hereinafter “IC”) of all students in the second year of the DS programme.

# Key Stakeholders in Project Activities at the Faculty of Computer Science

The key stakeholders in project activities at the Faculty of Computer Science include:

* **Project initiator** – person (or group of persons), who formulates a project proposal (project description), describing its objectives and terms for participation. A project initiator may be an HSE University staff member, representative of an IT firm or corporate IT department, or a Faculty of Computer Science student;
* **Project leader** – responsible staff member, who shall ensure the implementation of a project, assess the contributions of project team members, the outcomes of the project, and draw up report documentation during and after the project. An HSE University staff member may, or may not, serve as a project leader (however, Bachelor’s or Specialist degree students cannot oversee projects). A project’s initiator may act as its leader;
* **Mentor** – head of project from an IT firm or IT department of a company;
* **Project participant** – person directly taking part in a project’s process; this may refer to students, as well as HSE University staff members; with the implementation of external projects for actual clients, persons from outside of HSE University may take part therein;
* **Project curator** – academic supervisor of the DS programme and/or staff member appointed by him/her, who shall approve project proposals, take part in developing methodological materials for students, and approve report documents for projects carried out by second-year DS students;
* **Faculty of Computer Science Programme Office –** curriculumsupport unit for Bachelor’s programmes of the Faculty of Computer Science, engaged in including projects in students’ individual curricula, generating assessment records for the project defense committee, as well as tracking any academic failures on software projects, etc.;
* **Centre for Internships, Project Works and Entrepreneurship of the Faculty of Computer Science (FCS CIPE)** – organizer of project activities, engaged in the coordination, organization and methodological support for project activities of DS programme students; responsible for collecting and distributing projects, coordinating contacts with project leader or mentors, as well as the timely formulation and submission of project reports; organizes committees to review project defenses.

# Key Criteria for Projects

* 1. Projects carried out by DS students should concern respective fields of computer sciences, mathematics or IT.

## Project Types: Applied (Software) and Research Projects

* 1. Applied (software) project – developing software (hereinafter “SW”) or a hardware-software solution. The key results of an applied (software) project includes a finalized and applicable software system or a hardware-software solution.

 This type of activities covers the following steps:

• formulating the relevance and practical applicability of the developed program/software;

• developing statement of work (SoW) (functional and non-functional criteria, project schedule, etc.);

• overview and competitive analysis of current solutions (methods, approaches, algorithms and analogues);

• detailed formal description and rationale for proposed solutions;

• testing developed systems;

• comparing a proposed system with identified analogues in terms of its functionality, performance and usability;

• description of systems from the point of view of users;

• developing reporting documentation for the solution;

• defending the project before the committee by demonstrating the solution.

* 1. Research project – this is an analysis, carried out for the purpose of generating new knowledge about the object (phenomenon) being investigated, or the development of new or the upgrade of current methods and algorithms for solving theoretical and applied problems. The key result of the research project shall include new knowledge.

A research project covers:

• description of the subject field, relevance of topic, the object and subject of research;

• statement of objectives and goals;

• analytical overview of previous works on project topic;

• description and justification for proposed hypotheses and solutions;

• comparison of generated results with known analogues, e.g., on the basis of computational experiments, memory/time-based assessments of algorithms in terms of complexity, etc.;

• stating generated results with specification of academic innovation and/or practical relevance thereof;

• description of areas of future research in regards to the project topic;

• developing reporting documentation;

• defending projects before a committee.

Research projects may include the development of learning aids for academic courses.

## Projects Formats: Individual and Team (Group) Projects

* 1. Projects shall be implemented on an individual and team (group) basis.
	2. Total students on a single team cannot exceed 4 (four) members.
	3. When conducted by a team, project tasks should be expressly delegated among its members, whereby the work of each member shall be individually assessed. The key elements of the execution, finalization and defense of team projects are further specified in subsequent respective sections.

## Project on the Same Topic by Several Students

* 1. With the permission of a project curator and leader, several students may carry out their own individual projects on the same topic.
	2. Project leaders are responsible for ensuring the variation in projects, completed by respective students on the same topic. Project outcomes generated by all students engaged in a project concerning the same topic should vary. Methods to ensure the variability of projects may include: statement of tasks, various program development technologies, different analytical methods, etc.
	3. In all remaining respects, the preparation and assessment of projects executed on the same topic do not bear any other special features.

# Project Stages

* 1. Lists and milestones for the stages of selection and approval of topics, and the development and defense of DS programme projects are provided in Annex 1.

## Project Proposals and Project Descriptions

* 1. Project initiators – staff members of HSE University, IT firms, or corporate IT departments – may propose a project: by filling an e-form and attaching a description (Annex 2) by October 15 of the current academic year.
	2. Individual students or groups of students may also act as initiators of projects and submit project proposals. Individual students or groups of students should independently find a leader for their projects and obtain the latter’s approval for the project proposal. Initiative project proposals shall be submitted until October 22: by filling an e-form with an attached description of the project (Annex 2).
	3. The academic supervisor of the programme or project curator shall approve or discard project proposals by November 1. Curators may make enquiries with project initiators in order to specify the name and content of a given project, as well as its forecast outcomes, etc.

## Selection of Projects by Students and Selection of Students for Projects

* 1. Students shall submit project proposals to project leaders/mentors to take part in one or several approved projects. Project leaders (mentors) shall select students for projects and announce the results to learners and the CIPE. Students whose proposals to take part in projects have been declined may select another project.
	2. Students must fill in a special form, drawn up by the CIPE with an application for project selection attached, signed off by the respective student and project leader (Annex 3) by November 12.
	3. The CIPE shall provide the Bachelor’s programme office of the Faculty of Computer Science with a list of students, project leaders, and project topics in Russian and English by December 1.
	4. The Bachelor’s programme office of the Faculty of Computer Science shall input information about project topics and supervisors of students in the University’s information systems.

## Project Implementation. Ongoing Oversight. Milestones

* 1. Project supervisors, project curators, the CIPE, and the Bachelor’s programme office of the Faculty of Computer Science shall meet student requests for consulting assistance from December 1 until the set deadline for project submission, e.g., regarding public defense of projects.
	2. Ongoing oversight shall be implemented while projects are underway – Milestone 1 (hereinafter “MS1”), set to take place in February of the current academic year.
	3. Milestone 2 (MS2) implies defense of a project before the committee; defense of projects is held in April-June of the current academic year.

### Report on Milestone 1

* 1. Students shall draw up reports for Milestone 1. The criteria for reports on applied (software) projects and research projects may differ.
	2. Regardless of the type of project, each source on the report’s bibliography should have a link.
	3. An interim MS1 report on applied (software) projects should include:

• a title page;

• contents;

• key terms and definitions;

• introduction: short description of a subject field; relevance of research problem; objectives and goals of the project;

• overview and comparative analysis of sources and analogues;

• description of functional and non-functional criteria for software project;

• project timetable, indicating stages and timeframes for their execution;

• list of sources.

* 1. An interim MS1 report on a research project should include:
* a title page;
* contents;
* key terms, definitions and abbreviations;
* introduction: relevance, statement of task, research methods, goals and objectives, innovation and reliability of expected outcomes, their theoretical significance and applicability;
* overview and analysis of sources, selection of methods, algorithms and models for carrying out project tasks;
* list of used sources;
* annex – timetable of works, indicating deadlines;
	1. Students must provide the appropriate UDC[[1]](#footnote-2) on the title page of the report on their research project. The UDC has a hierarchical structure, e.g., 004.02, 004.424. Projects may cover several areas of knowledge, i.e., in this instance, the respective UDC numbers should be written with commas between them.
	2. Interim reports on MS1 (of any type) may be include additional materials on the initiative of students and/or project leaders, as well as respective annexes (if applicable).

### Stages of Milestone 1

* 1. Stages of MS1 Implementation:
* students shall draw up an interim report fir MS1, fill in a form, and attach the report to it and forward the report to the project leader;
* project supervisors and curators must review reports within a week and point out any mistakes or gaps to students;
* students should expand upon their reports, by including adjustments with due consideration of notes provided by project supervisors and curators, as well as sign the report’s title page and send it with this page to supervisors for assessment;
* students shall upload their reports and signed title page thereto to the “Software Projects, DS, Year 2” course projects via SmartLMS no later than the set timeframe.
	1. Ongoing oversight of project implementation shall be carried out project leaders. They must assess current outcomes produced by students, along with project reports.

## Changing Project Topics and/or Leaders

* 1. A project topic can be changed with the approval of a supervisor no later than April 1 of the current academic year.
		+ students may draw up an application to change the topic of the project (Annex 4), sign it and get the signature of the project leader, then send the application to the academic supervisor or project curator for approval;
		+ with the approval of an academic supervisor or project curator, students shall fill in a form to change their project topic, and attach an application and a project description (Annex 2) to this document.
	2. A project leader can be replaced no later than April 1 of the current academic year:
		+ students shall draw up applications for changing project leaders and/or topics (Annex 5), sign it off themselves and obtain the signatures of the project’s former and new supervisor, and then forward it for approval to the academic supervisor or project curator of the programme;
		+ upon the approval of an academic supervisor or project curators, students may fill in a form to change their project, including an application and a Project Description (Annex 2) attached thereto.
	3. In tandem with CIPE, the Bachelor’s programme office of the Faculty of Science shall submit information on changed project topics and/or leaders to the University’s information systems.

## Project Defense Preparations

* 1. Defenses of students’ projects shall be held between April and June.
	2. A timetable for the defense of projects shall be drawn up by a respective staff member of the Bachelor’s programme office of the Faculty of Computer Science and CIPE staff, and then sent as a notification to students no later than 2 (two) weeks prior to the start of the project defense process.
	3. Preliminary versions of program documentation and program/software reports shall be submitted to the respective supervisor 10 working days prior to the date when the final report should be submitted. Students should amend and upgrade the documentation and program / project report with due consideration of the supervisor’s notes.
	4. Students shall submit a final version of the project to the supervisor no later than 6 (six) working days prior to the date of the defense.
	5. The final report on the project shall be uploaded to SmartLMS no later than 6 (six) working days prior to the date of the defense.
	6. The final report shall be sent for check for plagiarism (percentage of borrowed materials) to the “Antiplagiat” system in SmartLMS. Documents may only be uploaded one time to this system.
	7. Based on the results of the review, a plagiarism report shall be created, which will serve as confirmation that the work has been uploaded to SmartLMS and indicate the identified percentage of borrowed materials. The allowable percentage of borrowed materials are as follows:
* for an applied project– 40%,
* for a research project– 20%
	1. Final project reports drawn up in English shall be uploaded to SmartLMS no later than 7 (seven) working days prior to the date of the given project’s defense in order to check the document for borrowed materials using the [www.turnitin.com](http://www.turnitin.com) service. The results of the plagiarism check will be then inputted by the programme manager to SmartLMS.
	2. Students shall upload the following to the projects section of the “Software Project, DS, Year 2” in SmartLMS no later than three 3 (three) working days prior to the date of the project defense:
* project report with appendices;
* feedback of project leader;
* “Antiplagiat” system report;
* Source codes and links to repositories (obligatory for applied (software) projects; for research projects if deemed necessary);
* other necessary materials.
	1. The report presentation shall be uploaded no later than 1 (one) working day prior to the date of the project defense.
	2. If the following deadline for uploading project materials to SmartLMS are not met:
* for review via the Antiplagiat system,
* in the project section in the ”Software Project, DS, Year 2”,

students shall then not be permitted to proceed to the project defense process.

* 1. Other issues regarding project preparation, shall be regulated by respective internal bylaws.

# Project Supervision

* 1. Project supervisor refers to responsible staff member, who ensures the implementation of a given project, evaluates the contributions of project members, writes up reports and other necessary documentation during and upon the completion of the project.
	2. Academic staff, invited teachers, other HSE University staff members, representatives of IT firms or corporate IT subdivisions shall be appointed supervisors of projects carried out by DS programme students. Furthermore, Faculty of Computer Science Master’s students may oversee projects.
	3. Project supervisors are responsible for organizing and implementing projects; their obligations include the following:
* drawing up a “project description” as per the template (Annex 2);
* completion of application forms for projects and attachment of project descriptions thereto;
* submission of students’ applications for projects and selection of students to take part in projects;
* if necessary, delegation of obligations among project participants;
* assistance to project participants in the organization of project implementation and preparing report materials on projects;
* oversight and assessment of the interim project stage (MS1);
* drawing up feedback on each student’s work under a given project;
* participation in the work of committees for project defense.
	1. Project leaders bear the right to recruit additional participants or replace participants in a given project, if a participant cannot fulfill their obligations thereunder owing to objective circumstances (i.e., illness, or other circumstances beyond the student’s control), as well as owing to a participant’s failure to fulfil their obligations, thereby subjecting the given project to risk.

Project supervisors must report any changes in project membership to the CIPE via their corporate e-mail no later than 3 (three) working days from the moment such changes occur.

* 1. Oversight and assessment of the interim project stage (MS1):
* students shall provide project leaders with the results of their work and the MS1 report for the project no later than the set date for its review (see Annex 1);
* within a week, the project leader will review the report and indicate any mistakes or gaps to participating students;
* after receipt of an adjusted MS1 report, the supervisor will assess the outcomes of each student and provide his/her grade.
	1. Assessment of project outcomes:
* students shall provide project supervisors with a final version of their project no later than 6 (six) working days prior to the date of the project defense (projects in English – 7 (seven) working days prior to the date of the defense);
* after receiving the final version of the project from a student/students, project supervisors shall prepare feedback, guided by the criteria set out in the feedback form (Annexes 6 and 7), while also providing a concise comment on a grade awarded, specifying the key strengths and weaknesses of the project;
* the project leader shall draw up feedback with an assessment of each student’s work;
* the leader of the team project will draw up individual feedback with assessments of the work of each team member.
	1. If the percentage of borrowed material exceeds the set standard value by over 5%, the relevant student shall not be permitted to take part in the project defense.
	2. If the percentage of borrowed materials does not exceed the limit by 5%, and if the project supervisor recommends the relevant student for the defense process, the former shall draw up a memo addressed to the programme’s academic supervisor and specify this in the feedback, explaining the grounds for the borrowed material.
	3. If a student fails to submit project materials to their supervisor on time, the latter may write feedback for them and retains the right to assign the student a grade of 0 with commentary stating that the report was not submitted on time.
	4. Project supervisors shall bear the right to decline to write feedback, if a given student fails to submit required documents on time. Without a supervisor’s feedback, students cannot be admitted to the project defense process.
	5. Feedback forms for supervisors of applied (software) projects are provided in Annex 6.
	6. Feedback forms for supervisors of research projects are provided in Annex 7.
	7. Feedback from supervisors of projects carried out in English may be drawn up in Russian or English.

# Criteria for Project Format and Content

* 1. Based on the results of a project’s execution, a report shall be drawn up. Short recommendations on how reports should be formatted are provided in Annex 10.
	2. The following report structure on the applied (software) project is recommended:
* title page;
* abstract (0.5-1.0 pages):
	+ list of key words;
	+ short description of object and subject of analysis;
	+ project objective;
	+ method or methodology;
	+ project outcomes;
	+ testing of results (publication, presentations at conferences, report theses, certificates of program/software registration, etc.);
* table of contents;
* key terms, definitions and abbreviations;
* introduction: description of subject field, relevance of problem, object, subject and methods of analysis, innovation and validity of generated outcomes, their theoretical relevance and/or practical value, and goals and objectives of project;
* overview and comparative analysis of sources on the project topic, selection of methods, algorithms, and models for carrying out assigned tasks;
* overview and comparative analysis of analogues on the basis of the analysis – functional and non-functional criteria for the program;
* theoretical part: description of selected or proposed methods, algorithms, data models, methods, etc.;
* project implementation:
	+ architecture/project structure/programme structure;
	+ specific reasons for selecting means, instruments, mechanisms and technologies;
	+ design of database with a description;
	+ description of server portion of project;
	+ description of client part of project;
	+ implementation of core algorithms;
	+ diagram of class, description of classes, links to repositories with source codes/classes;
	+ description of program launch (where it can be downloaded, how it can be started and rolled out), and its use (how it operates);
	+ plans and results of program/software testing;
* analysis and assessment of generated results;
* conclusion: key results and conclusions, prospects for further research on the given topic;
* list of sources used;
* annexes if necessary: annexes may include data/information used for the report, the results of experiments (e.g., tables, graphs, etc.), source codes of programs/software or links to repositories, user instructions, program testing plans and outcomes, class descriptions and plans, database models, etc.
	1. The following report structure is recommended for research projects:
* title page;
* abstract (0.5-1.0 pages):
	+ list of key terms;
	+ short description of object and subject of research;
	+ project objective;
	+ method or methodological approaches for work;
	+ project results;
	+ testing of outcomes (publications, presentations on conferences, report theses, certificates of registration of programs, etc.);
* contents;
* key terms, definitions and abbreviations;
* introduction: relevance of topic, object, subject and analytical method, innovation and reliability of generated results, their theoretical relevance and/or practical value, objects and goals of project;
* overview and comparative analysis of sources relating to project topic;
* theoretical part: description of selected or proposed methods, algorithms, models, methods, etc.;
* description of plan for computational experiments, instruments and methods of implementation, data sources, metrics, analysis and assessment of generated outcomes;
* conclusion: key outcomes and conclusions, prospects for future research on the respective topic;
* list of sources used;
* annexes if necessary: annexes may include data used for the project, results of experiments (tables, graphs, etc.), source codes or links to repositories, models, etc.
	1. With the consent of the project’s leader and curator, the report may exclude some of the aforementioned points. Furthermore, additional materials may be included therein with the approval of the supervisor.
	2. With the consent of a project’s leader and curator, the report may be drawn up in line with criteria for publications for specific subject-based conferences or journals. For this, an abstract should indicate the name of the conference or journal, as well as provide a reference to a page with the relevant publication criteria.
	3. The report’s title page shall be drawn up as per Annexes 8 or 9 in the language, in which the report was written up.
	4. A report’s title page for a report project should indicate its UDC – this is an international universal digital classification code for the specific field of knowledge. Use of UDC has a hierarchical structure, e.g., 004.02, 004.424. Projects may cover several fields of knowledge, whereby the respective UDC numbers should be specified, as well as separated by commas.
	5. A list of sources and links thereto should be drawn up for all projects.
	6. When engaged in a project, students are obliged to submit the project’s source code along with the report text.
	7. Annexes to a project (source codes for programs/software, executable files, new data collections, etc., should be made accessible (e.g., GitHub or Yandex.Disk), providing references in the text of the project report.
	8. Source codes may be provided in a closed format with access provided to the academic supervisor/project curator and members of the committee. All instances whereby the provision of a code is impossible (e.g., if a project is being executed at a company) shall be decided on an individual basis with the respective academic supervisor/project curator.

## Key Features in Contents of Team Reports

* 1. An applied (software) project may be implemented by a group of up to 4 (four) students.
	2. Each student on a team should write up their own report, which will spell out their respective contribution to the project.
	3. Reports authored by team members may share an introduction and conclusion, as well as sections describing the purpose and objectives of the entire project, program criteria, and a description of the results produced by the team. In the shared parts of reports, authors should concisely describe the tasks and contributions of each participant, the correlation between their contribution of each student and the overall outcome produced.
	4. Allowable percentage of borrowed material in reports on team projects:
* 20% borrowed material from external sources;
* 20% borrowed material – within the team for respective reports;
	1. The team supervisor shall draw up feedback for each student/team member, with an assessment of the work and contributions of each participant.

## Key Features in Projects in English

* 1. A project may be carried out entirely in English, which shall be verified against the signature of the supervisor on a student’s application, indicating the intended language for their project (Annex 3).
	2. The language of the project’s execution cannot be changed.
	3. Project reports drawn up in English should coincide with the template for journal articles (e.g., IEEE CS4, 5), or the criteria for conference reports (e.g., IEEE CS6).
	4. List of sources and references should be drawn up in line with the criteria of English-language journals or conference proceedings on applied mathematics and computer science (e.g., in the style of IEEE7, 8).
	5. Feedback of project supervisors for projects in English may be drawn up Russian or English.

# Project Public Defense

* 1. Projects implemented by DS students shall be subject to obligatory public defense.
	2. To carry out the project defense process, the academic supervisor and CIPE shall form a committee staffed with academics from the HSE University Faculty of Computer Science, staff members from other University subdivisions, and other academic institutions, scientific organizations, IT firms and corporate IT departments. A chairperson and secretary shall be appointed to each committee.
	3. Public defense of projects shall be held during Module 4 of the academic year as per the approved timetable.
	4. The committee shall be provided with the following materials for each student:
* project report;
* project supervisor’s feedback;
* a report from the “Antiplagiat” system;
* source codes or links to repositories (obligatory for software projects; optional for research projects if necessary);
* presentation;
* other necessary materials.

All documents should be submitted electronically and uploaded by students to projects for respective courses in HSE University’s SmartLMS (edu.hse.ru).

* 1. Defense procedures include a student’s presentation (up to 15 minutes), questions from committee members and the student’s answers thereto.
	2. Students shall make a presentation (the presentation template is provided in Annex 10). Students have the right to use electronic and technical means, if necessary, while demonstrating a program/software developed under their project.
	3. Students shall defend their projects in English. Their presentation should be written up in English.
	4. If a project defense is being carried out remotely or in a blended format, it should be implemented remotely with the use of video recording.
	5. Defense of group projects shall be held with each group member individually. Defenses of all group members, if possible, shall be held at the same committee session. Each student should talk about the results they personally generated while working on a particular subsystem, emphasizing the place of their subsystem in the functionality of the entire program/software system, as well as their respective contribution to the team’s results.

# Project Assessment

* 1. Upon the completion of the project defense process, committee shall issue their grades to students who made presentations.
	2. Grades shall be issued on a five-point and 10-point scale. For group projects, grades should be issued for each student individually.
	3. Supervisors of projects defended by a student cannot take part in assessment of said student’s project defense.
	4. When assessing applied (software) projects, committees should grade:

Од – quality of report and responses to questions;

Оо – quality of program documentation;

Опр – quality of developed software/application, its complexity and thoroughness of the solution.

The Committee’s grade bears a blocking character.

* 1. When preparing a grade for a research project, the committee shall consider the feedback of the supervisor (Oрук) and assess the following:

Од – quality of report and responses to questions;

Оо – quality of report’s formatting and contents;

Ои – quality and comprehensiveness of analysis;

The Committee’s grade has a blocking character.

* 1. The final grade for a project is calculated on a 10-point scale according to the formula:

Оитог = 0.1 \* MS1 + 0.4 \* Орук + 0.5 \* КТ2 (committee’s grade)

* 1. The committee may scale up a final grade, if a student has made a presentation at an IT conference on the topic of the project, has a certificate of program/software registration, a certificate of installation, or publication/acceptance for publication of an article in a collection of works/academic journal, or is a winner of a competition for research papers held for HSE University students in the Computer Science category, etc.
	2. Upon the completion of the defense process, the committee chairperson shall fill in an assessment record, as per the set template. All committee members shall sign the completed record.
	3. Appeals against project grades shall be carried out as per the procedures set out in the Regulations on Interim and Ongoing Assessment of Students at HSE University[[2]](#footnote-3), in line with appeals against examination results (Section VI).

# Procedures for Removing Academic Failures for Projects

* 1. Students who fail to appear at the project defense without any valid reason, and/or who have not been allowed to proceed to take part in the defense and/or who has received an unsatisfactory grade for the project, shall be deemed to have an academic failure, which must be rectified as per established procedures.
	2. Procedures for re-submission of projects are included in the Regulations on Interim and Ongoing Assessment of Students at HSE University (Section VII).
	3. Students have the right, within the set timeframes, to change the topic and/or supervisor of their project to repeat the defense process. In turn, the programme office shall input respective changes to HSE University’s’ information systems.
	4. If the topic of a project has been changed, the MS1 grade shall be calculated equal to 0.
	5. Preparation and defense of projects by students with academic failures for the project shall be carried out in line with the procedures spelled out in these Guidelines, using the same formula for assessments/grading.

#  Criteria for Project Publications and Storage

* 1. Committees for project defense may recommend project outcomes for publication in academic or technical journals, or publication on the website of the HSE University Faculty of Computer Science and other online resources.
	2. To publish projects on the CIPE webpage “Best Student Projects”, the following materials, preferably in Russian and English, should be uploaded to the “Software Project, DS, Year 2” in SmartLMS:
* name of project;
* information on author (full name, degree programme, year of study, year of project defense, contact information – at the discretion of the project author);
* information on project leader (full name, position, place of work, link to a personal page, if available);
* project abstract in Russian and English.

Project authors may also upload program documentation or parts thereof for publication, as well as project reports, source codes or links to their repositories for programs/applications, or links to program/app, and other materials.

* 1. The results of the completed project may be formatted to receive state certification to register software[[3]](#footnote-4).
	2. Projects shall be stored with the CIPE for a period of 2 (two) years after the completion of each student’s studies.

# Annex 1Project Timetable

**Table 1 –**

**List and Milestones of Selection, Approval, Preparation and Defense of Projects**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Preparation Stage**  | **Party Responsible for Stage of Software Project**  | **Timeframe** |
|  | Collection of proposed project topics; completion of project applications and project descriptions  | Subdivisions of HSE University and Faculty of Computer Science, representatives of IT firms, students / CIPE | From September 10 until October 15 of the current academic year  |
|  | Approval of proposed project topics by academic supervisor and project curators under the programme | Project curators / academic supervisor/ CIPE | By October 15 of the current academic year |
|  | Opening access to project applications to DS students  | CIPE | No later than October 15 of the current academic year  |
|  | Initiative proposals for project topics from students  | Students / project curators  | No later than October 22 of the current academic year  |
|  | Approval of project initiatives from DS students  | Students/project supervisors/academic supervisor/project curators  | Decision made no later than November 1 of the current academic year  |
|  | Students’ selection of project, selection of project participants by project leaders  | Student/project leaders  | No later than November 12 of the current academic year  |
|  | MS1. Submission of interim project results and interim project report to project leader and curator  | Student/ project leaders / project curator  | No later than February 3 of the current academic year  |
|  | MS1. Review of project reports; commentaries provided to students | Project leaders / project curator | No later than February 10 of the current academic year  |
|  | MS1. Uploading of revised report with a student’s signature on title page  | Project leaders / project curator / students | No later than February 17 of the current academic year  |
|  | MS1. Assessment of results and submission of grades to CIPE  | Project leaders  | No later than February 22 of the current academic year  |
|  | Changing topic / project leader | Students / Project leader / project curator / CIPE / programme office | No later than April 1 of the current academic year  |
|  | Approving timetable for project defense  | Programme office | No later than two weeks prior to the start of the project defense |
|  | Submission of project results to project leader  | Student / Project leader  | No later than 10 working days prior to the defense date  |
|  | Preparation and submission of final version of project results to supervisor  | Student/ Project leader | No later than six working days prior to the defense date  |
|  | Uploading final version of project to SmartLMS for review via the “Antiplagiat” system  | Student | No later than six working days prior to the defense date  |
|  | Supervisor’s feedback | Project leader / CIPE | No later than three working days prior to the defense day  |
|  | If the percentage of borrowed material exceeds the set value[[4]](#footnote-5) for not more than 5% and the project leader allows the student to take part in the defense process, the former shall draw up a memo addressed to the academic supervisor with a description of the borrowed and plagiarized material | Project leader / academic supervisor / CIPE  | No later than three working days prior to the defense date  |
|  | Uploading final version of project to the “Software Project, DS, Year 2” course assignment in SmartLMS; supervisor’s feedback; report form the “Antiplagiat” system, other necessary materials  | Student / CIPE | No later than three working days prior to the defense date  |
| 1.
 | Public defense of project  | Student / committee / project leader/ CIPE | As per approved timetable  |

# Annex 2 Description of Project for Students of the HSE University Faculty of Computer Science (2021/2022 Academic Year)

**Description of Student Project for HSE University Faculty of Computer Science (2021/2022 Academic Year)**

|  |  |
| --- | --- |
| Title of project (in Russian) |   |
| Title of project (in English) |   |
| Project type  | Applied (software) / Research*Remove as appropriate* |
| Project format   | Individual/ Team*Remove as appropriate* |
| Total number of students taking part in the project (for group projects)  |  Up to \_\_\_\_ (no more than 4) |
| Project initiator  | *Full legal name of company /* *HSE University*  |
| Corporate department / HSE University |    |
| Full name of mentor/project leader  |  *Full name*  |
| Project abstract  |   |
| Goal of project  |   |
| Project tasks  |    |
| Tasks of each project participant (role in project) – only for group projects  |   |
| Planned project results   |   |
| Other information   |   |
| Location of project  |    |
| Criteria for participants/project participants   |     |
| Students’ project applications accepted  | Via email / link / other *remove as appropriate* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_ 2021 until October 15, 2021 |
| Format for selecting students (interviews, testing, assignments, etc.)  |   |
| Criteria for supervisor’s assessment of project   | 8-10 points (excellent):6-7 points (good):4-5 points (satisfactory)0-3 points(unsatisfactory)  |

# Annex 3 Application to Select Project Topic

**Government of the Russian Federation**

**National Research University Higher School of Economics**

**Faculty of Computer Sciences**

**Degree Programme “Data Science and Business Analytics ”**

**Application**

**for project**

|  |  |
| --- | --- |
| Full name of student:  |  |
| Group | **БПАД\_\_\_\_** |
| Project topic in Russian:  |  |
| Topic in English: |  |
| Language of project: (remove as appropriate): | **English** |
| Type of project (remove as appropriate): | **Applied (Software) Project / Research Project**  |
| Project format (remove as appropriate): | **Individual Project / Team Project**  |
| Project leader:  |  |
| full name: |  |
| degree: |  |
| position: |  |
| place of work: |  |
| **I have been hereby informed that changing the project topic and/or project leader is possible no later than April 1 of the current academic year.**  |
|  |
| **Student** |  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |   |
| **Project Leader**  |  *signature*  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*signature* | *date**date* |

# Annex 4 Application for Changing Project Topic

 **Government of the Russian Federation**

**National Research University Higher School of Economics**

**Faculty of Computer Science**

**Degree Programme “Data Science and Business Analytics”**

**Application**

**to change the project topic**

|  |  |
| --- | --- |
| Full name of student: |  |
| Topic in Russian:  | *(new if changed)* |
| Topic in English: | *(new if changed)* |
| Language of project: | **English** |
| Type of project: | **Applied (Software) / Analytical** *(remove as appropriate)* |
| Form of project: | **Individual / Team** *(remove as appropriate)* |
| **I have been informed that:**1. **changes in the project topic is possible no later than April 1 of the current academic year;**
2. **if the project topic is changed, a new project description should be uploaded with this application.**
 |
| **Student in Group \_\_\_\_\_\_\_\_\_\_\_\_\_** |   |
|  |  *signature last name, initials.* Date: \_\_\_\_\_\_\_\_\_\_\_ |
| **Project Leader:** |   |
| *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**position, place of work*  |  *signature last name, initials* Date: \_\_\_\_\_\_\_\_\_\_\_ |

# Annex 5 Application to Change Project Topic/Leader

 **Government of the Russian Federation**

**National Research University Higher School of Economics**

**Faculty of Computer Sciences**

**Degree Programme “Data Science and Business Analytics”**

**APPLICATION**

**to Change Project Topic/Leader**

|  |  |
| --- | --- |
| Full name: |  |
| Topic in Russian: | *(new if changed)* |
| Topic in English: | *(new if changed)* |
| Language of project: | **English** |
| Type of project: | **Applied (software)/ Research** *(remove as appropriate)* |
| Project format: | **Individual / Team** *(remove as appropriate)* |
| **I have been hereby informed that:** 1. **changes to the project topic and/or leader is possible no later than April 1 of the current academic year;**
2. **if the topic is changed, a new project description must be uploaded along with this application.**
 |
| **Student of group \_\_\_\_\_\_\_\_\_\_\_\_\_** |   |
|  |  *signature last name, initials* Date: \_\_\_\_\_\_\_\_\_\_\_ |
| **Previous Project Leader:** |   |
| *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**position, place of work*  |  *signature last name, initials*Date: \_\_\_\_\_\_\_\_\_\_\_ |
| **New Project Leader :** | *(if the project leader has not been changed, the lines about a new supervisor must be deleted)*  |
| *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**position, place of work*  |  *signature last name, initials* Date:\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |

# Annex 6 Template for Feedback of Supervisor of Applied (Software) Project (2 options)

**Option 1.**

GOVERNMENT OF THE RUSSIAN FEDERATION

NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS

Faculty of Computer Science

Degree Programme “Data Science and Business Analytics”

 **Feedback of Supervisor of Applied (Software) Project**

For the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

name of project

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

carried out by second-year student of the DS programme, БПАД group\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

last name, first name, middle name/patronymic

|  |  |  |
| --- | --- | --- |
| No. | **Assessment Criteria**  | **Academic supervisor’s grade** **(on a 10-point scale)**  |
| 1. | Concise and correct statement of objectives and goals  |   |
|  2. | Efficiency in use of information sources (books, articles, HSE University e-Library, online resources, etc.) |   |
| 3. | Complexity and/or volume of analysis/theoretical component in the work |   |
| 4. | Complexity and/or volume of program/applied technological solutions  |   |
| 5. | Achievement of stated objective and goals  |   |
| 6. | Format and structure of report   |   |

Percentage of plagiarized material based on Antiplagiat system analysis (cannot exceed 40%); access to defense:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments on grades (to be filled in by a project leader):

PROJECT LEADER’S FINAL GRADE excellent/good/satisfactory/unsatisfactory **(\_\_ points out of 10)**

Leader \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*full name, degree, title, position, place of work*

Date

**Option 2.**

GOVERNMENT OF THE RUSSIAN FEDERATION

NATIONAL RESEARCH UNIVERISTY HIGHER SCHOOL OF ECONOMICS

Faculty of Computer Science

Degree Programme “Data Science and Business Analytics”

**Feedback of Supervisor of Applied (Software) Project**

For the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

name of project

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Carried out by second-year DS student, group БПАД \_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

last name, first name, middle name/patronymic

*Sample contents of feedback*

*Short description of work*

*Determining objectives and goals, validity and relevance*

*Proposed solutions (algorithms, methods, models, etc.)*

*Use of technologies*

*Quality of program implementation*

*Achieved results; validity of generated results (e.g., software testing results); innovative and/or practical characteristics of program solutions;*

*Prospects, options for practical application, installation, areas of further development*

*Adherence to format rules*

*Student (full name), in his/her participation in the applied (software) project, performed <strengths, weaknesses, notes>. ….. level of independent and creative thinking shown by student*

Percentage of plagiarized material based on Antiplagiat system analysis (cannot exceed 40%); admission to defense:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FINAL GREADE OF LEADER – excellent/good/satisfactory/unsatisfactory **( \_ points out of 10)**

Leader \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

full name, degree, tittle, position, place of work

Date

# Annex 7 Template for Supervisor’s Feedback on Research Projects (2 Options)

**Option 1.**

GOVERNMENT OF THE RUSSIAN FEDERATION

NATIONAL RESEARCH UNIVERISTY HIGHER SCHOOL OF ECONOMICS

Faculty of Computer Science

Degree Programme “Data Science and Business Analytics”

**Feedback of Supervisor of Research Project**

For the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

name of project

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Carried out by second-year DS student, Group БПАД\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

last name, full name, middle name/patronymic

*Sample feedback contents*

*Short description of work*

*Determining project objectives and goals; justification and relevance; definitions and terms used; effectiveness and adequacy of analytical methods; clarity of submitted materials;*

*Achieved results: which of the set project objectives have been met, innovation and/or practical relevance; validity of generated outcomes;*

*Prospects, areas for future work*

*Formatting of report*

*Student <full name>, when engaged in the research project, performed <strengths, weaknesses, notes>…level of independence and creativity, demonstrated by the student.*

Percentage of plagiarized material based on Antiplagiat system analysis (cannot exceed 40%); access to defense:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Supervisor’s assignment has been <fully/not fully> completed.

Student <full name> has earned a grade of **excellent/good/satisfactory./unsatisfactory ( \_\_ points out of 10)**

**Project leader** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

full name, degree, title, position, place of work

Date

**Option 2.**

GOVERNMENT OF THE RUSSIAN FEDERATION

NATIONAL RESEARCH UNIVERSITY HIGEHR SCHOOL OF ECONOMICS

Faculty of Computer Science
Degree Programme “Data Science and Business Analytics”

 **Feedback of Supervisor of Research Project**

on the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

name of project

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

carried out by second-year student of the DS programme, group БПАД \_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

last name, first name, middle name/patronymic

|  |  |  |
| --- | --- | --- |
| No. | Assessment Criteria  | Supervisor’s grade (on 10-point scale)  |
| 1. | Accuracy and correctness in determining and formulating objectives and goals  |   |
|  2. | Full use of information sources (books, articles, HSE University electronic resources, web-sources, etc.) |   |
| 3. | Complexity and/or volume of analysis/theoretical component |   |
| 4. | Complexity and/or volume of program/applied technological solutions |   |
| 5.  | Attainment of set objective and execution of project goals  |   |
| 6. | Quality of report formatting  |   |

Percentage of plagiarized materials based on analysis from the Antiplagiat system (cannot exceed 20 % - for individual projects, 40% - for team projects); admission to defense

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Commentaries (to be filled in by project leader):

**FINAL GRADE OF LEADER** excellent/good/satisfactory/unsatisfactory **( \_ points of 10)**

Leader\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

full name, degree, title, position, place of work

Date

**Option 3.**

**National Research University Higher School of Economics**

**Faculty of Computer Science**

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

**Analytics**

**Review of Software Project**

Software/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. | **Assessment Criteria (*only assess those applicable to student’s work*)** |  **Grade (on a 10-point scale)** |
| 1. | Precision and accuracy in formulating the project’s aims and goals |   |
| 2. | Full use of information sources (books, articles, HSE University electronic resources, web-sources, etc.) |   |
| 3. | Complexity and volume of the completed work  |   |
| 4. | Complexity and/or capacity of software implementation / proposed technological solution / investigation of core research problem  |   |
| 5. | Accomplishment of the project’s aims and goals  |   |
| 6. | Quality of the composed text |   |

Plagiarism evaluation from the Antiplagiat system (cannot be higher than 20% - analytical project; 40% - software project); admission to project defense

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

General commentary on work and scores (completed by project leader):

FINAL GRADE OF LEADER excellent/good/satisfactory/unsatisfactory **( \_ out of 10)** Supervisor/Reviewer\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

position, academic degree, department/place of work/ full name/signature

Date

# Annex 8 Title Page MS1

**NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS**

Faculty of Computer Science

Bachelor’s Programme “HSE University and University of London Double Degree Programme in Data Science and Business Analytics”

UDC \_\_\_\_\_\_\_\_\_\_\_

**Research Project Report**

on the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(interim, first stage)

carried out by Student:

group #БПАД \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

signature surname, first name, middle name/patronymic, if any

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date

checked by the Project Leader:

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

surname, first name, middle name/patronymic (if any), academic title (if any)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

position

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

place of work (company or HSE University subdivision)

Date \_\_\_\_\_\_\_\_\_, 2022 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 grade on a 10-point scale signature

**Moscow, 2022**

**NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS**

Faculty of Computer Science

Bachelor’s Programme “HSE University and University of London Double Degree Programme in Data Science and Business Analytics”

**Software Project Report**

on the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(interim, first stage)

carried out by Student**:**

group #БПАД\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

signature surname, first name, middle name/patronymic, if any

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

date

Checked by the Project Leader**:**

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

surname, first name, middle name/patronymic (if any), academic title (if any)

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Position

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place of work (company or HSE Department)

Date\_\_\_\_\_\_\_\_\_, 2022 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 grade on a 10-point scale signature

**Moscow, 2022**

# Annex 9 Title Page for Final Project Report

**NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS**

Faculty of Computer Science

Bachelor’s Programme “HSE University and University of London Double Degree Programme in Data Science and Business Analytics”

UDC ХХХХХ

**Research Project Report (Final)**

On the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Fulfilled by the Student:**

group БПАД\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

signature surname, first name, middle name/patronymic, if any

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date

**Checked by the Project Supervisor:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

surname, first name, middle name/patronymic (if any), academic title (if any)

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position

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place of work (company or HSE University subdivision)

Date \_\_\_\_\_\_\_\_\_, 2022 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 grade on a 10-point scale signature

**Moscow, 2022**

**NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS**

Faculty of Computer Science

Bachelor’s Programme “HSE University and University of London Double Degree Programme in Data Science and Business Analytics”

**Software Project Report (Final)**

on the topic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**carried out by Student:**

group БПАД\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

signature surname, first name, middle name/patronymic, if any

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

date

**checked by the Project Leader:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

surname, first name, middle name/patronymic (if any), academic title (if any)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

position

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place of work (company or HSE University subidivision)

Date \_\_\_\_\_\_\_\_\_, 2022 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 grade on a 10-point scale signature

**Moscow, 2022**

# Annex 10 Sample Structure of Defense Presentation

 **Sample Presentation Contents (Slides)**

Not all slides might be in your presentation. You can add your own as deemed necessary.

1. Title slide (name of work, author (full name, group), project leader (position, place of work, degree, full name));
2. Description of subject field;
3. Key terms, abbreviations and definitions;
4. Relevance of work;
5. Project objective and goals (single objective, tasks N> 1);
6. Criteria for programming product (for software project);
7. Analysis of current approaches/methods/models algorithms/solutions;
8. Selection of project methods/algorithms/models, etc.;
9. Description of developed methods/algorithms/models, etc.;
10. Selection of implementation methods, use of outside library resources (for programming project)
11. Program architecture, key features of implementation, you findings and solutions, class diagrams, etc. (for software project);
12. Interface, screenshots (for software project);
13. Experiment planning (for research project);
14. Experiment outcomes (for research project);
15. Demonstration of software/application (e.g., video demo) (for software project);
16. Core results and conclusions. Innovative and/or practical relevance of project. Can the results be published? Can the program/software be registered as an IP (intellectual property)?;
17. Fields for further development;
18. List of resources used; all slides should be numbered.

HSE University’s presentation templates are recommended for use; they can be viewed at: <https://www.hse.ru/info/brandbook>; or sample FCS presentations can be seen on the website of the Faculty of Computer Science at: <https://cs.hse.ru/style>.

# Annex 11 Recommendations for Reports

P11.1 Pages

Margins: left – 25, right – 10, upper and lower –20.

Numbering of page - End-to-end, bottom of page, center justified. Should start after the title page (title page is not numbered).

The header may include the topic of the project and the full name of the report author (size 9pt and in grey).

P11.2 Sections and Headings

Each section should start on a new page.

The headings of sections and subsections of the main part of a report should be numbers. Periods should not be placed at the end of headings. Headings cannot feature text in parentheses.

Abstract (overview), Introduction, Conclusion. Lists of bibliographic sources shall not be numbered.

Annexes should be numbers by letters of the Russian alphabet.

The heading should not be separated from the main text.

Advice: Set “not separate from next” in the paragraph parameters.

П11.3 Fonts and Paragraph Formats

Font of main text: Times New Roman, 12 pt. through 1.5 in., indentation 1,25, equal justification

Tables should use a font size of 10 pt. with an interval of 1, without indentation; equalized in left or right justification.

Formatting fragments, pseudocode: font *courier new* or *consolas*, without indentation, possible through 1 int. and font size 10 pt.

Code fragments can be presented in diagrams.

П11.4 Diagrams, Tables and Formulas

Diagrams, tables and pictures should be placed in the text immediately after the first citation or on the subsequent page.

References should be included in the text for all tables, pictures, formulas, etc.

Formulas, diagrams and tables shall be numbered through the entire text of the report or with the addition of section numbers (application symbols).

P11.4.1 Diagrams

All diagrams should be numbers and feature a signature.

The numbering of diagrams can be continuous through the entire text, or run throughout a respective section, whereby the diagram number should also include the section number.

Diagrams and signatures shall be center justified on the page, text should be wrapped “from above and below”.

References should be in place for all diagrams in the report text (as shown in Diagram 3, refer to Diagram 3a, etc.)

Diagrams must be signed. The signature should be placed under the center of the diagram; the word “Diagram” should be written without abbreviation, e.g.,

 

*Diagram p9.1 –Roadmap*



*Diagram p10.2 – call tree*



а) b)

*Diagram p9.3 – illustration examples а) – roadmap, b) – call tree*

Examples of references to diagrams in the text: “diagram 1”, or “refer to diagram 4.2”, or “as shown in diagram 3a”.

***Advice***: To make editing easy, set the circumfluence of the diagram text from above and below. In addition, diagrams should be placed in contained bedding.

P11.4.2 Re: Tables

All tables should be numbers and signed. If there is just one table in the report, it shall not be numbered.

The words “Table X” (X – number of table) and its name should appear before the table.

Reference should be in place for all tables; the word “table” should not be abbreviated in the reference (Table 8)

Tables should be signed of above. The word “Table” should not be abbreviated. The title should be left justified, without break. Table name format and example:

“Table <Table number> – Number of Table”

Label 1 –Logical Operations

|  |  |  |  |
| --- | --- | --- | --- |
| №  | Operation | Figure  | Corresponding speech patters  |
| 1  | Negative (inversion, logical “NO”)  | ***А***  **not *А*** not *A*  | not *А* Unsure that *А*  |

Text format for tables: font Times New Roman, 12 or 10 pt., with 1.0 int, without indentation, aligned in table cells with left or center justification; table headings should be center justified.

Example of a line to a table in the text “As show in Table 1”.

***Advice***: set “repeat heading line” under “Layout”.

P11.4.3 Re: Formula

Formulas should be center justified.

Formula numbers should be right justified in parentheses.

References to formulas in the text – only its number, without the word “formula”, e.g., (8).

Only those formulas, which have reference in the text, shall be numbered.

Immediately after each formula, the variables used therein should be described, indicated the units of measurement.

The variables and units of measurement should be described from the next line, without a line break, after the word “whereby”. E.g.,

 s = v \* t, (1)

Whereby s - space, м; v - speed, м/с; t - time, с.

If the variables were already described for other formulas, they do not need to be repeated.

***Comment***: place tabulation in the center of the line, center justified, for the location of the formulate; at the end of the line, at 15.5 cm, for the placement of the function.

П11.4.4 Sources and References

References for all sources form the bibliographic lists should appear in the text. Citations should appear in parentheses, e.g.,: [2], [5 – 7], [3, 8, 12]

1. Refer to <http://www.udcsummary.info/php/index.php?id=13358&lang=ru> [↑](#footnote-ref-2)
2. See https://www.hse.ru/docs/551872110.html [↑](#footnote-ref-3)
3. ###  More information on state registration of programs/software for computers or databases can be found on the homepage of [Rospatent](https://rospatent.gov.ru/ru/stateservices/gosudarstvennaya-registraciya-programmy-dlya-elektronnyh-vychislitelnyh-mashin-ili-bazy-dannyh-i-vydacha-svidetelstv-o-gosudarstvennoy-registracii-programmy-dlya-elektronnyh-vychislitelnyh-mashin-ili-bazy-dannyh-ih-dublikatov), on the [Gosuslugi](https://www.gosuslugi.ru/16260/3) website.

 [↑](#footnote-ref-4)
4. Allowable percentage of borrowed materials: for applied projects – no more than 40%; for research projects - no more than 20% [↑](#footnote-ref-5)