**Federal State Autonomous Educational Institution of Higher Education**

**National Research University**

**Higher School of Economics**

**Faculty of Business and Management**

**Department of Innovation and Business in the Field of Information Technology**

**INTERNSHIP PROGRAM**

For the area of study 38.04.05 Business informatics Master’s Programme

“Big Data Systems”

Program author:

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Approved by the Academic Council

of Educational Programmme "Big Data Systems" "\_\_\_" \_\_\_\_\_\_\_\_\_\_\_\_ 2019

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Moscow, 2019

This program cannot be used by other departments of the university and other universities without the permission of the School of Business Informatics - the developer of the program.

**I .GENERAL PROVISIONS**

**1. The aims of internship**

The objectives of the production practice are:

- consolidation of theoretical knowledge obtained in the study of basic and special disciplines;

- gaining practical research experience, particularly in a team of researchers;

- the acquisition of practical skills and competencies in a professional field.

**2. Objectives of internship**

The objectives of internship are:

- Mastering the methodology of organizing and conducting research work in scientific research laboratories of universities, organizations and enterprises.

- Mastering modern research methods, including instrumental ones.

- Search, processing, analysis and systematization of scientific and technical information on the research topic, the choice of methods and means of solving the problem.

- Collecting and analysis of materials for the master’s thesis.

**3. The place of Internship in the structure of the Master’s Programme**

Internship is based on the basic and special disciplines of the main educational Master's Programme “Big Data Systems” in the area 38.04.05 “Business Informatics”.

To successfully complete internship, a student must:

**know:**

- hardware and software for the implementation of information technology, the basics of working in local and global networks;

- intelligent systems;

- characteristics and the state of electronic business market and its development trends;

- the main models of electronic business;

- typical stages of organizing business using the Internet and documentation;

**be able to:**

- work as a user of a personal computer;

- find solutions in intelligent systems and environments;

- determine the aims and objectives of projects in the field of electronic business;

- choose and apply working methods for a specific project task;

- plan and document the stages of the project;

- analyze the results;

- develop recommendations for the management of a project;

**Be equipped:**

- methods of optimization and decision making;

- methods of conceptual design and system analysis.

The internship is carried out after theoretical training and precedes the completion of the master's thesis.

**4. Форма проведения производственной практики – лабораторная.**

**4. Internship should be in the form of laboratory work.**

**5. Place and time of internship**

The place for conducting an internship for this master's program could be departments of the School of Business Informatics of the Higher School of Economics, enterprises with which HSE has agreements on internships or students’ workplaces confirmed by a letter of agreement from the organization representatives. The internship takes place in module 3 in the 2nd year of study. The internship duration is 8 weeks

# The list of planned learning outcomes during the internship, correlated with the planned results of the mastery of the educational programme’s curriculum (COMPETENCE)

**6.** **Learning outcomes formed through internship**

According to the competency matrix of the program’s graduate:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Master’s Programme structure** | **credit** | | **Professional objectives** | | | | | | | | | | | | | | |
|  | |  | СК-1 | **ЗЕ** | УК-7 | **ЗЕ** | УК-8 | **ЗЕ** | ОПК-5 | **ЗЕ** | ПК-8 | **ЗЕ** | ПК-11 | **ЗЕ** | ПК-15 | **ЗЕ** | ПК-23ЗЕ ПК-24 ЗЕ |
| Internship | | 12,0 | РБ СД | 2 | СД | 2 | СД | 1 | СД | 1 | СД | 1 | СД | 1 | РБ СД | 2 | СД МЦ 2 А2, А4, А7, ОУ1, ОУ5, ОУ8, П2, НИ1, НИ2, К1, К2, К7 |

As a result of this internship, the student should:

- have the ability to reflect (evaluate and process) learned scientific methods and types of activities;

- have the ability to propose concepts, models, invent and test methods and tools of professional activity;

- have the ability to improve and develop their intellectual and cultural level, build a trajectory of professional development and career;

- have the ability to build professional activities, business and make choices, guided by the principles of social responsibility;

- have the ability to generate fundamentally new ideas and products, has creativity, initiative;

- identify and predict the main directions of the use of modern ICT for business efficiency management;

- conduct research and prepare analytical materials for evaluating events and developing strategic decisions in the field of ICT.

# Internship structure and content

The internship credit load is 12 credits, 432 hours.

**7. The internship includes the following stages:**

- studying of specialized literature and other scientific and technical information, the achievements of domestic and foreign science and technology in the relevant field of knowledge;

- choosing of the research topic, taking into account the recommendations of the department where research is planned, the analysis of the research relevance (or taking into account the recommendations of the representative of the employer (enterprise), where the research will be carried out);

- collecting, processing, analysing and systematizing of scientific and technical information on the topic of research work, review of the literature, statement of the problem;

- participation in conducting experiments, improving the measurement procedure (if any) and conducting research on the topic;

- preparing the report on the research topic, presentation of the report abstracts at the conference, preparation of materials for publication.

**8. Modern technologies used during internship**

A student, together with the supervisor, draws up a practice plan in accordance with the internship task, including a detailed acquaintance with the research conducted in the laboratory, research methods, performing specific research activities, collecting materials for the internship report and for the master's thesis. These activities are carried out by the student while systematically consulting with the internship supervisor.

**9. Educational and methodological support of student self-study during internship**

During internship, current monitoring of the student’s work, including self-study, is carried out by the internship supervisor in the framework of regular consultations; a separate interim assessment of particular internship stages is not required.

# Internship report and interim assessment

Таким образом общая оценка по практике формируется согласно следующей формуле:

Qитоговая = 0,2\*Qкуратора от организации + 0,3\*Q академического руководителя от кафедры + 0,5\*Qотчетных материалов

Отчетные материалы по практике оцениваются согласно шкале, приведенной в таблице:

At the end of the internship, a student draws up a written report and an internship diary signed by the internship supervisor from an enterprise and submits it to the internship supervisor from the higher educational institution. The internship report should contain information about the work specifically performed by the student during the internship period.

Within 10 days after the internship completion a student provides:

1. an internship report.

2. The response of an internship supervisor from an enterprise (company/organization) in a free form with an assessment of the trainee's work on a 10-point scale. The response of the internship supervisor is provided on the letterhead of the organization. The review must be signed by the internship supervisor.

The final grade for internship is equivalent to grades (tests) for theoretical training and is taken into account when summing up the overall performance of students.

The final grade for the internship is formed according to the formula indicated in the table and depends on how the supervisor from the organization, the academic supervisor of Big Data Systems Master’s Programme or the head of the department of Business Informatics assessed a student’s internship. It also depends on the assessment of the internship report.

Thus, the final grade for the internship is formed according to the following formula:

Q-total = 0.2 \* Q of an internship supervisor from the organization + 0.3 \* Q of the academic supervisor from the department + 0.5 \* Q of internship report materials

Report materials on practice are assessed according to the scale given in the table:

|  |  |
| --- | --- |
| **Report assessment criteria** | *Grade* |
| A holistic, well-developed, logically stated text without internal contradictions, corresponding to the methodological recommendations on written works, the requirements of the internship supervisor. The tasks set are completed in full and correctly, the problem is articulated, the work is original and contributes to the increase in knowledge in a specific problem area (in order to get "10"). | *Excellent,  8-10* |
| Well-developed and presented text without significant internal contradictions, corresponding to the methodological recommendations on written works, the requirements of the internship supervisor. Almost all tasks have been completed in full. | *Good,*  *6-7* |
| Incoherent text at times, internal contradictions. Incomplete compliance with methodological recommendations on written works, the requirements of the internship supervisor. Some tasks have not been completed / performed not in full volume. There are gross errors, the low originality of the text, the lack of convincing findings. | *Satisfactory, 4-5* |
| The text is incoherent. There are significant contradictions. Does not comply with methodological recommendations on written works, the requirements of the internship supervisor. Most tasks have been failed. | *Unsatisfactory 0-3 балла* |

Students who have not completed the internship due to a valid excuse are reassigned to their internship in their free from studies time. Students who have not completed their internship without a valid excuse or received an unsatisfactory grade can be expelled from the HSE as having an academic failure as per the Rules for Interim and Ongoing Assessments of Students at HSE University.

Student internship is evaluated on a ten-point grading scale and is taken into account when summing up the student’s overall performance.

Students who have not completed the internship without a valid excuse or who received an unsatisfactory grade are considered to have an academic failure. The failure can be eliminated in accordance with the Rules for Interim and Ongoing Assessments of Students at HSE. University Students who have not completed the internship at the graduation course are not allowed to the state final certification.

# Instructional, methodological, and informational support

**10. Instructional, methodological, and informational internship support**

Instructional and methodological internship support is the basic and additional literature recommended for the study of professional disciplines, periodicals, educational and methodological manuals of the university and other materials related to the subject of the research laboratory where students pass the internship.

During internship, it is necessary to use standard software, application software packages and Internet resources necessary for an in-depth study of the problem.

# Description of material and technical base necessary for the internship.

The presence of a PC laboratory, combined in a local and global network, the availability of wide range of software.

**The list of educational literature and resources on the Internet, necessary for the internship**

|  |  |
| --- | --- |
| **№N** | **Title** |
| Basic literature | |
| **11** | Johannesson, P., & Perjons, E. (2014). An introduction to design science. Springer. |
| **12** | Wysocki, R. K. (2011). Effective project management: traditional, agile, extreme. John Wiley & Sons. |
| Additional literature | |
| **1** | Zagorulko Yu.A. Artificial Intelligence. Knowledge Engineering: studies. manual for universities / Yu.A. Zagorulko, GB Zagorulko. – M.: Publishing house Jurajt, 2018. 93 p. [Access mode: www.biblio-online.ru/book/3276B4D4-A6AE-4996-8A2D-986F8A3C4CA6] |
| Internet resources | |
| **11** | IBM ILOG CPLEX Optimization Studio OPL Language User’s manual. [https://www.ibm.com/support/knowledgecenter/SSSA5P\_12.6.3/ilog.odms.studio.help/pdf/o pl\_languser.pdf](https://www.ibm.com/support/knowledgecenter/SSSA5P_12.6.3/ilog.odms.studio.help/pdf/opl_languser.pdf) |

**12 Organization of internship.**

In accordance with the educational standard for Master’s programmes in the area of study 38.04.05 "Business Informatics", the internship is an obligatory item in a main educational Master’s programme and it is aimed at developing systemic and professional competencies in accordance with the requirements of this educational standard of the Higher School of Economics. The following types and stages of the internship work are expected:

- planning activities, including familiarization with the specific research area, and the choice of research topic, writing an abstract on a selected topic;

- performing internship activities;

- adjusting the internship plan

- preparing an internship report;

- public defense of the work performed;

- publication of the results of the research work in the recommended list of domestic and foreign journals.

The main form of planning and adjusting an individual internship plan is the selection and justification of the topic, discussion of the plan and the intermediate results of the study. During the internship and in the process of defending its results, a wide discussion should be held in the educational structures of the university with the involvement of employers and leading researchers, which allows assessing the level of acquired knowledge, skills and competencies of students. It is also necessary to assess the competencies associated with the formation of a professional worldview and a certain level of culture.

The internship is carried out under the guidance of an instructor (doctor or candidate of sciences), appointed for the entire period of master's training. Students are distributed among instructors at the beginning of the first semester (the preferences of students are taking into account). The internship activities in the third semester are devoted to the working on master's thesis. The topic of the thesis should correlate with and reflect the internship results.

**14. Types of internships, stages and forms of monitoring its implementation**

Types of Master’s degree internships:

* Experimental study;
* theoretical (calculations);
* technological;
* in the form of a project;
* information and analytical;
* scientific-pedagogical.

Программа научно исследовательской практики магистрантов включает в себя следующие этапы:

* изучение специальной литературы и другой научно-технической информации, достижений отечественной и зарубежной науки и техники в соответствующей области знаний;
* выбор темы исследований с учетом рекомендации кафедры, на которой планируется проведение НИР, анализ ее актуальности;
* сбор, обработку, анализ и систематизацию научно-технической информации по теме работы, составление обзора литературы, постановка задачи;
* участие в создании экспериментальных установок, отработке методики измерений и проведении научных исследований по теме работы;
* участие в составлении отчета (разделы отчета) по теме или ее разделу, подготовка доклада и тезисов доклада на конференции, подготовка материалов к публикации.

По результатам производственной работы магистрант оформляет отчет в соответствии с ГОСТ.

В конце семестра проводится защита отчета в комиссии из двух преподавателей, один из которых – руководитель практики магистранта. По результатам защиты отчета выставляется оценка по десятибалльной шкале.

The program of research internship includes the following stages:

- the study of specialized literature and other scientific and technical information, the achievements of domestic and foreign science and technology in the relevant field of knowledge;

- selection of research topics, taking into account the recommendations of the department, which is planned to conduct research, analysis of its relevance;

- collection, processing, analysis and systematization of scientific and technical information on the topic of work, a review of the literature, statement of the problem;

- participation in the creation of experimental facilities, development of measurement procedures and research on the topic of work;

- participation in the preparation of the report on the topic or its section, presentation of the report’s messages at the conference, preparation of materials for publication.

Based on the internship results, a student prepares a report in accordance with GOST.

At the end of the semester, the report is defended by a student in a commission of two instructors, one of which is the student’s internship supervisor. Based on the results of the report defense, the final grade on a ten-point scale for the internship is given to the student.

# Internship report

1. ***A certificate*** with a seal from the organization where the internship was held, containing the name of the organization, the duration of the internship
2. ***Internship report structure***
   * Title page
   * Table of contents
   * Introduction
   * Body (main part)
   * Conclusion
   * Reference list
   * Appendix

**In the introduction,** writethe rationale for choosing a certain work placement, state the relevance of the problem, define aims and objectives of the internship, determine the obtained results, and provide the description of the report’s structure.

**The body (main part)** should contain:

1. Brief information about the place of internship: profile of the organization.
2. Explanation of how the objectives for the internship were set. The theoretical and methodological base necessary to reach the objectives. Justification of the choices you made in terms of methods and means used to reach the objectives.
3. Discussion (description of the main results).
4. Analysis and synthesis of data, information, and materials on the subject of research of the master's thesis collected during internship.

**The conclusion** should include synthesis of the internship results and the key findings.

**The reference list** should contain the sources used.

**Appendices** should contain**:**

1. Materials that provide the report with necessary details on the decisions made for reaching the internship’s goals and objectives, tables, business process models, etc.
2. A detailed plan and sections of the master's thesis.

**Report design** is carried out per the requirements defined in the methodological recommendations on written works for students of the “Business Informatics” area of study.

Appendix 1. Title page

FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF HIGHER EDUCATION

NATIONAL RESEARCH UNIVERSITY „HIGHER SCHOOL OF ECONOMICS”

###### Faculty of Business and Management

**Internship Report**

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

Full name

Year of study \_\_\_\_, level of study *Master’s Programme* *„Big Data Systems”*

|  |  |
| --- | --- |
| Moscow 2020 | Internship supervisor  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Full name  Department  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Name of the Department |