

*Federal State Autonomous Educational Institution of
Higher Education
Peoples' Friendship University of Russia
Academy of Engineering*

WORKING PROGRAM OF PRACTICE

Practice type: Internship

Practice type and its name: Internship for obtaining professional skills and experience of professional activity (research)

Field of study: 09.06.01 Informatics and Computer Technologies

Major: Mathematical Modeling, Numerical Methods and Software Program (Technical Science)

Moscow,
2021

The working program of research activities was developed in accordance with the curriculum in the field of study: 09.06.01 Informatics and Computer Technologies, major: Mathematical Modeling, Numerical Methods and Software Program (Technical Science), admission of 20__, approved at the meeting of the Academic Council of the Academy of Engineering

The working program for "Internship for obtaining professional skills and experience of professional activity (research)" was considered at the meeting of the Department of Mechanics and Mechatronics

Developers:

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1. Internship Goals and Tasks

Internship for obtaining professional skills and experience of professional activity (research) is an industrial practice and is aimed at acquiring practical skills in independent research work, consolidating theoretical knowledge gained during classroom, practical, laboratory and educational research classes, as well as introducing a graduate student to the social environment in order to acquire social and personal competencies, necessary for work in the professional field.

Main Tasks of Internship for obtaining professional skills and experience of professional activity (research) are:

- to study the experience of scientific and analytical activities;
- to learn the skills of presenting the results obtained in the form of reports, publications, reports;
- to master modern methods and methodology of scientific research.

2. The place of internship in the structure of EP of HE

Internship for obtaining professional skills and experience of professional activity (research) belongs to the variable part of Block 2 of the curriculum. Its passage is based on the material of previous disciplines and / or practices, and it is also basic for the study of subsequent disciplines and / or practices of the curriculum, the list of which is presented in Table 1.

Table 1 - List of previous and subsequent disciplines / practices

№ п/п	Preceding disciplines / practices	Subsequent disciplines
1	Methods of teaching informatics and computer technology in higher education	Computational methods of intelligent systems
2	Research methodology	System analysis, information management and processing
		State final exam

3. Ways of conducting practice

The methods of conducting the Practice for obtaining professional skills and professional experience (research) are as follows:

- stationary.

4. Scope of practice and types of educational work

Table 2 - Scope of practice and types of educational work

Type of educational work	Total, academic hours	Term	
		1	2
Contact work of a student with a teacher, including control	44	22	22

Other forms of educational work, including keeping a diary of practice and preparing a report for students		172	86	86
Type of certification test			Pass with grade	Pass with grade
Total workload	Academic hours	216	108	108
	credits	6	3	3
Duration of internship	weeks	Distributed	Distributed	Distributed

5. Place of practice

The place of internship is provided to the student by the head of the internship on the basis of the relevant agreements concluded with the basic organizations.

The bases for the students to pass the Practice for obtaining professional skills and experience of professional activity (research) is the Department of Mechanics and Mechatronics of the Institute of Space Technologies of the RUDN University.

The student can come up with an initiative about the place of internship. The direction of the professional activity of the organization offered to students for internship must correspond to the profile of the educational program and the types of professional activities for which the graduate of the program is preparing. The place of the internship must be agreed with the head of the department / department with the subsequent (with a positive decision) the conclusion of an appropriate agreement with the organization proposed by the student.

Students with disabilities and / or those belonging to the category of "disabled" undergo practical training in a form accessible to them in the laboratories of the university, as well as in specialized organizations with which the relevant agreements have been concluded and which have the opportunity (equipment, special means and infrastructure) to work with these categories of citizens.

6. The list of the planned results of the internship, correlated with the planned results of mastering the educational program

Practice for obtaining professional skills and experience of professional activity (research) is aimed at developing the following competencies among students (UK-1; OPK-2; PC-2; PC-3):

- the ability to critically analyze and evaluate modern scientific achievements, generate new ideas when solving research and practical problems, including in interdisciplinary areas (UK-1);

- possession of the culture of scientific research, including the use of modern information and communication technologies (OPK-2);

- the ability to develop new research methods and their application in independent research activities in the field of informatics and computer technology, taking into account the rules of observance of copyright (PC-2);

- the ability for independent (including leading) research activities, requiring broad fundamental training in modern areas of industry science, deep specialized training in the chosen direction, possession of the skills of modern research methods (PC-3);

The result of the internship is knowledge, skills, competencies and abilities of professional activity, which characterize the stages of the formation of competencies and ensure the achievement of the planned results of mastering the educational program, presented in Table 3.

Table 3 - Learning outcomes in the discipline, correlated with the planned results of mastering EP of HE

Competence	Knowledge	Skill	Abilities
1	2	3	4
the ability to develop new research methods and their application in independent research activities in the field of informatics and computer technology, taking into account the rules of copyright compliance (PC-2)	principles and traditions of organizing and conducting scientific research	use modern computer technology and specialized software in research work	Ability to conduct scientific research, including the use of modern information and communication technologies
The ability for independent (including leading) research activities based on deep fundamental training in modern areas of industry science in the field of informatics and computer technology (PC-3)	fundamental knowledge in the fields of informatics and computer technology	to provide research activities using the obtained knowledge	skills of correct registration of the results of research activities

7. Structure and content of practice

<i>1 TERM</i>					
№ п/п	Stages of practice	Types of work carried out by students	Educational work by forms, academic hours		Total, academic hours.
			Contact work	Other forms of educational work	
1	Organizational and preparatory	Receiving an individual assignment for practice from the head	1	-	1
2		Workplace safety briefing (laboratory and / or production)	1	-	1
3	Main	Selection of the object and subject of scientific research	-	20	20
4		Statement of the goal and objectives of the dissertation research	-	20	10
5		Search for information, compilation of thematic lists of literature, catalogs, card files and other types of descriptions, classifications and typologies on the topic of the thesis	-	20	10
		Ongoing control of the internship by the head	10	-	10
9	Reporting	Presentation and defence of the results of the work performed on research practice		26	
10		Intermediate attestation (preparation for defense and defense of presentation)	10	-	10

TOTAL:			22	86	108
2 TERM					
№ п/п	Stages of practice	Types of work carried out by students	Educational work by forms, academic hours		Total, academic hours.
			<i>Контактная работа</i>	<i>Иные формы учебной работы</i>	
1	Organizational and preparatory	Obtaining an individual assignment for practice from the head	1	-	1
2		Workplace safety briefing (laboratory and / or production)	1	-	1
3	Main	Justification of the relevance of the research topic	-	20	20
4		Determination of the degree of scientific elaboration of the research topic	-	20	20
5		Mastering modern research methodology	-	20	20
8.		Keeping an internship diary	-	10	10
		Current control of the internship by the head	10	-	10
9	Отчетный	Reporting Preparation of an internship report	-	16	16
10		Intermediate attestation (preparation for protection and protection of the report)	10	-	10
TOTAL:			22	86	108

For students from among persons with disabilities and / or belonging to the category of "disabled", if necessary, the head of the practice develops individual tasks, a plan and procedure for passing the practice, taking into account the peculiarities of their psychophysical development, individual capabilities and health status, an educational program adapted for these students (if any) and in accordance with individual rehabilitation programs for the disabled.

8. Educational, research and production technologies used in practice

In the process of passing the Practice for obtaining professional skills and professional experience (research), the following educational technologies are used:

- contact work of a student with a teacher, which consists in receiving an individual assignment, undergoing safety briefing, receiving advice on internship issues, filling out current and reporting documentation, as well as protecting a report on internship;
- other forms of educational work (educational activities), which include the main activity of the student on the implementation of sections of practice in accordance with the individual task, recommended methods and literature sources, aimed at the formation of certain professional skills or experience of professional activity provided for by the practice program, as well as filling out the current and reporting documentation, and preparing for the defense of the report on the passage of internship.

During the internship, the following research and development technologies are used:

- mastering by students the methods of information analysis and interpretation of the results of research activities;
- execution of written analytical and calculation tasks within the framework of practice using recommended information sources;
- the use of various computer software products for graphic, analytical and / or industrial purposes (depending on the place of internship and the specifics of the task);

- use by students of various electronic library and legal reference systems, etc.

9. Educational-methodical and informational support of educational practice

Main literature:

1. Research of control systems: Textbook / Baranov V.V., Zaitsev A.V., Sokolov S.N. - M.: Alpina Publisher, 2013. -- 216 p. Access mode .
<http://www.studentlibrary.ru/book/ISBN9785890358271>
2. Lapaeva, M.G. Research methodology: a textbook for graduate students / M.G. Lapaeva, S.P. Lapaev; Ministry of Education and Science of the Russian Federation, Federal State Budgetary Educational Institution of Higher Education "Orenburg State University". - Orenburg: OSU, 2017. -- 249 p. : ill. - Bibliography. in the book. - ISBN 978-5-7410-1791-3; The same [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=485476> (05/06/2018) Fundamentals of Scientific Research. [Electronic resource] / Shklyar M.F. - M.: Dashkov and K, 2016. -- <http://www.studentlibrary.ru/book/ISBN9785394018008.html>
3. Miroshnichenko N. A., Stefanov S. A. To help a young teacher. method. allowance / N. A. Miroshnichenko, S. A. Stefanov.- Odessa: Legal Literature, 2003.-92 p. 2. Development of the professionalism of a higher school teacher. ucheb.-method. allowance. Ed. 2nd, sr. / V. S. Agapov [et al.] .- M.: Publishing house of RAGS, 2017.-384 p. http://lib.rudn.ru/MegaPro2/UserEntry?Action=Rudn_FindDoc&id=470098&idb=0
4. Skok G.B., Lygina N.I. How to design the educational process for the course: Study guide. Ed. second, revised and add. - M.: Pedagogical Society of Russia. 2017. -- 96p. http://lib.rudn.ru/MegaPro2/UserEntry?Action=Rudn_FindDoc&id=470098&idb=0
5. Management of the quality of education: Practice-oriented monograph and methodological manual / Ed. M.M. Potashnik. M., 2016.

Additional literature:

1. Master's thesis [Electronic resource]: textbook / K.S. Idiatullina, I.Z. Garafiev. - Kazan: Publishing House of KNRTU, 2015.http://lib.rudn.ru/MegaPro2/UserEntry?Action=Rudn_FindDoc&id=418786&idb=0
2. Planning and organization of scientific research [Electronic resource]: textbook / V.I. Komlatsky, S.V. Loginov, G.V. Komlatsky. - Rostov n / a: Phoenix, 2017. - (Higher education) - Access mode http://lib.rudn.ru/MegaPro2/UserEntry?Action=Rudn_FindDoc&id=470098&idb=0

Periodicals:

1. Magazine "Expert"
2. Journal "Automation and control in technical systems"
3. Journal "Control systems, communications and security" Ресурсы информационно-телекоммуникационной сети «Интернет»:

1. EBS of RUDN University and third-party EBS to which university students have access on the basis of concluded agreements:

- RUDN University Electronic Library System - RUDN University Library System
<http://lib.rudn.ru/MegaPro/Web>

- EBS "University Library Online" <http://www.biblioclub.ru>

- EBS Yurayt <http://www.biblio-online.ru>

- EBS "Student Consultant" www.studentlibrary.ru

- EBS "Doe" <http://e.lanbook.com/>

2. Databases and search engines:

- electronic fund of legal and normative-technical documentation <http://docs.cntd.ru/>

- Yandex search engine <https://www.yandex.ru/>

- Google search engine <https://www.google.ru/>

- SCOPUS abstract database <http://www.elsevierscience.ru/products/scopus/>

Software:

The use of specialized software during the practice is not provided.

Methodological materials for passing practice, maintaining current and preparing reporting documentation for students (also posted in the TUIS RUDN University in the relevant section of the discipline):

1. Methodical instructions for passing practice, maintaining current and preparing reporting documentation for students in the direction 09.06.01 Informatics and computer technology, profile Mathematical modeling, numerical methods and program complexes (Engineering) (Appendix 2).

10. Material and technical support of educational practice

For the successful implementation of educational practice for obtaining primary professional skills and abilities, it is necessary: a workplace, a computer, a printer, a library fund.

To process the materials collected by the student during the practice to obtain professional skills and professional experience, there is access to computer classes.

The library fund must provide students with basic literature in the amount of 0.5 copies per person.

Also, students are allowed to use the Internet at University Institutions.

11. Forms of practice certification

In the process of passing the practice, the teacher carries out current control of the student's implementation of the assignment for practice. Based on the results of the practice, intermediate certification is provided in the form of a set-off with an assessment (based on the results of the defense of the report on practice).

12. Fund of assessment tools for intermediate certification trainees in practice

The fund of assessment tools, formed for the current monitoring of progress and intermediate certification of students in the Practice for obtaining professional skills and

professional experience (research) is presented in Appendix 1 to the work program of the practice and includes:

- a list of competencies formed in the course of internship;
- description of indicators and criteria for assessing competencies, description of assessment scales;
- typical control tasks or other materials necessary to assess knowledge, skills, skills and (or) experience of activities, characterizing the level of competence formation;
- methodological materials that determine the procedures for assessing knowledge, skills, abilities and (or) competencies, characterizing the level of competence formation.