

Документ подписан простой электронной подписью
Информация о владельце:
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Должность: Ректор
Дата подписания: 28.06.2024 11:02:18
Уникальный программный ключ:
ca953a0120d891083f939673078ef1a989dae18a

Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
RUDN University

Academy of Engineering

educational division (faculty/institute/academy) as higher education programme developer

INTERNSHIP SYLLABUS

Pre-Graduation Internship in Industry

internship title

Internship

internship type

Recommended by the Didactic Council for the Education Field of:

01.04.02 Applied Mathematics and Informatics

field of studies / speciality code and title

The student's internship is implemented within the professional education programme of higher education:

Space Mission and System Design

higher education programme profile/specialisation title

1. INTERNSHIP GOAL(s)

Pre-Graduation Internship is industrial practice and is aimed at deepening, systematizing and consolidating theoretical knowledge, as well as obtaining professional skills in the field of ballistic design of space complexes and systems in the chosen area of research, collecting, processing and analyzing the material necessary for the development of final qualifying work ; formation and development of practical skills and competencies of the master, gaining experience in independent professional activity; consolidation and deepening of the acquired theoretical knowledge in the studied disciplines; developing skills for masters to apply the knowledge acquired during training in independent professional activities.

The main objectives of pre-graduate practice are:

- ability for self-organization and self-education;
- effectively and fully solve professional and scientific-professional tasks, realize professional-business, scientific-professional, general cultural communicative needs by means of the Russian language;
- ability to solve standard problems of professional activity on the basis of information and bibliographic culture using information and communication technologies and taking into account the basic requirements of information security;
- ability to use basic knowledge of natural sciences, mathematics and computer science, basic facts, concepts, principles of theories related to applied mathematics and computer science;
- ability to understand, improve and apply modern mathematical apparatus;
- the ability to critically rethink the accumulated experience, change, if necessary, the type and nature of one's professional activity;
- clarification of the composition and volume of final qualifying work; collection of initial data on the topic of the final qualifying work and the necessary technical literature;
- familiarizing students with the structure and operating features of enterprises that correspond to the profile of their final qualifying work (hereinafter referred to as Enterprises);
- informational preparation for completing the final qualifying work and the beginning of work on the master's thesis.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Pre-graduation practice is aimed at developing the following competencies (parts of competencies) in students:

Table 2.1. List of competences that students acquire during the internship

Competence code	Competence descriptor	Competence formation indicators (within this course)
UC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, to develop an action strategy	UC-1.1 Analyzes the task, highlighting its basic components; UC-1.2 Defines and ranks the information required to solve the task; UC-1.3 Searches for information to solve the task by various types of queries; UC-1.4 Offers solutions to the problem, analyzes the possible consequences of their use; UC-1.5 Analyzes ways to solve problems of a philosophical, moral and personal nature based on the use of basic philosophical ideas and categories in their historical development and socio-cultural context.

Competence code	Competence descriptor	Competence formation indicators (within this course)
UC-2	Able to manage a project at all stages of its life cycle.	UC-2.1 Formulates a problem, the solution of which is directly related to the achievement of the project goal; UC-2.2 Defines the links between the tasks set and the expected results of their solution; UC-2.3, Within the framework of the tasks set, determines the available resources and limitations, the applicable legal norms; UC-2.4 Analyzes the project implementation schedule as a whole and selects the optimal way to solve the tasks, based on the current legal norms and available resources and limitations; UC-2.5 Monitors the progress of the project, adjusts the schedule in accordance with the results of the control.
UC-3	Able to organize and manage the work of the team, developing a team strategy to achieve the goal.	UC-3.1 Defines its role in the team, based on the strategy of cooperation to achieve the goal; UC-3.2 Formulates and takes into account in its activities the behavioral characteristics of groups of people identified depending on the goal; UC-3.3 Analyzes the possible consequences of personal actions and plans its actions to achieve the desired result; UC-3.4 Exchanges information, knowledge and experience with team members; UC-3.5 Argues its point of view regarding the use of ideas of other team members to achieve the goal; UC-3.6 Participates in team work on the execution of assignments
UC-4	Able to apply modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction.	UC-4.1 Chooses the style of business communication, depending on the language of communication, the purpose and conditions of partnership; UC-4.2 Adapts speech, communication style and sign language to interaction situations; UC-4.3 Searches for the necessary information to solve standard communication tasks in Russian and foreign languages; UC-4.4 Conducts business correspondence in Russian and foreign languages, taking into account the peculiarities of the style of official and unofficial letters and socio-cultural differences in the format of correspondence; UC-4.5 Uses dialogue for cooperation in academic communication, taking into account the personality of the interlocutors, their communicative and speech strategy and tactics, the degree of formality of the situation; UC-4.6 Forms and argues its own assessment of the main ideas of the participants of the dialogue

Competence code	Competence descriptor	Competence formation indicators (within this course)
		(discussion) in accordance with the needs of joint activities.
UC-5	Able to analyze and take into account the diversity of cultures in the process of intercultural interaction.	<p>UC-5.1 Interprets the history of Russia in the context of world historical development;</p> <p>UC-5.2 Finds and uses information about cultural peculiarities and traditions of various social groups in social and professional communication;</p> <p>UC-5.3 Takes into account the historical heritage and socio-cultural traditions of various social groups, ethnic groups and confessions, including world religions, philosophical and ethical teachings, in social and professional communication on a given topic;</p> <p>UC-5.4 Collects information on a given topic, taking into account the ethnicities and confessions most widely represented at the study sites;</p> <p>UC-5.5 Substantiates the specifics of project and team activities with representatives of other ethnicities and (or) confessions;</p> <p>UC-5.6 Adheres to the principles of non-discriminatory interaction in personal and mass communication in order to perform professional tasks and strengthening social integration</p>
UC-6	Able to identify and implement the priorities of their own activities and ways to improve it based on self-assessment.	<p>UC-6.1 Controls the amount of time spent on specific activities;</p> <p>UC-6.2 Develops tools and methods of time management when performing specific tasks, projects, goals;</p> <p>UC-6.3 Analyzes its resources and their limits (personal, situational, temporary, etc.), for the successful completion of the task;</p> <p>UC-6.4 Assigns tasks to long-, medium- and short-term ones with justification of relevance and analysis of resources for their implementation.</p>
UC-7	Able to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions	<p>UC-7.1 Searches for the necessary sources of information and data, perceives, analyzes, remembers and transmits information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems;</p> <p>UC-7.2 Evaluates information, its reliability, builds logical conclusions based on incoming information and data.</p>

Competence code	Competence descriptor	Competence formation indicators (within this course)
	based on incoming information and data.	
GPC-2	Able to improve and implement new mathematical methods for solving applied problems.	<p>GPC-2.1 Uses results of applied mathematics to learn, adapt new methods for solving problems in the area of professional interest.</p> <p>GPC-2.2 Implements and improves new methods for solving applied problems in the area of professional interest.</p> <p>GPC-2.3 Performs qualitative and quantitative analysis of the obtained solution in order to construct an optimal variant.</p>
GPC-3	Able to develop mathematical models and analyze them when solving problems in the field of professional activity.	<p>GPC-3.1 Develops mathematical models in applied mathematics and computer science.</p> <p>GPC-3.2 Analyse mathematical models to solve applied professional problems.</p> <p>GPC-3.3 Develops and analyses new mathematical models to solve applied problems in applied mathematics and computer science.</p>
GPC-4	Able to combine and adapt existing ones; information and communication technologies for solving problems in the field of professional activity, taking into account the requirements of information security.	<p>GPC-4.1 Analyse applied mathematics and computer science problems using information technology.</p> <p>GPC-4.2 Consider basic information security requirements.</p> <p>GPC-4.3 Uses modern information and communication technologies to solve problems in Applied Mathematics and Computer Science, taking into account information security requirements.</p>
PC-1	Able to formulate goals, tasks of scientific research in applied mathematics and computer science, computer engineering and modern programming technologies, to choose methods and means of problem solving.	<p>PC-1.1. Has a fundamental knowledge of mathematics and/or science, programming and information technology</p> <p>PC-1.2. Can identify, formulate and solve standard problems in his/her own research activities in the area of applied mathematics and computer science, computer science and modern programming technologies.</p> <p>PC-1.3 Has practical experience of research activities in applied mathematics and computer science, computer science and modern programming technologies.</p>
PC-2	Able to apply modern theoretical and experimental methods to develop mathematical models of investigated objects and processes related to professional activity in the field of training and to participate in their	<p>PC- 2.1 Knows modern theoretical and experimental methods for developing mathematical models, innovative design tools and elements of information systems architecture</p> <p>PC- 2.2 Can design and implement mathematical model algorithms based on simulation languages and application packages</p> <p>PC- 2.3 Has practical experience in developing implementation options for information systems using innovative tools.</p>

Competence code	Competence descriptor	Competence formation indicators (within this course)
	implementation in the form of software products.	
PC-3	Able to participate in research and development of design solutions in the field of ballistics, dynamics and flight control of spacecraft	<p>PC- 3.1 Knows basic mathematical methods and modern tools in the field of ballistic design of space systems and systems.</p> <p>PC- 3.2 Has basic knowledge of standards, norms and rules for the development of design solutions in the field of ballistics, dynamics and flight control of spacecraft.</p> <p>PC- 3.3 Can apply mathematical methods and modern information technologies for research and development of design solutions in the field of ballistics, dynamics and control of spacecraft flight.</p>
PC-4	Able to conduct work and research on processing and analysis of scientific and technical information in the field of application of mathematical methods and information technologies for creation of space products and provision of space services based on the use of remote sensing data and geoinformation systems	<p>PC- 4.1 Knows fundamental principles of remote sensing, basic mathematical methods and information technology in the application of Earth remote sensing systems. Knows theory and methodology for creating thematic information products and services based on the use of remote sensing data and geographic information systems.</p> <p>PC- 4.2 Can solve analytical problems, can use geographic information system software packages, understands the approach to big data and basic data processing workflows, can use remote sensing materials and geographic information technology in modeling and interpretation results.</p> <p>PC- 4.3 Has skills to design space products and provide space services based on the use of remote sensing data and geographic information systems.</p>
PC-5	Able to analyze, including in English, ballistic and dynamic characteristics research methods for modeling spacecraft trajectories.	<p>PC- 5.1 Knows the developed and used techniques, including those from English-language sources, to study ballistic and dynamic characteristics when modeling spacecraft flight trajectories</p> <p>PC- 5.2 Can develop and modernize techniques for studying ballistic and dynamic characteristics when simulating spacecraft flight trajectories</p> <p>PC-5.3 Has skills to create space products and provide space services based on the use of remote sensing data and geoinformation systems.</p>

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The internship refers to the corecomponent of (B2) block of the higher educational programme curriculum.

* Underline whatever applicable. The core component includes all introductory field internships, the variable component includes all advanced field internships, except for research

and pre-graduate types of the internship. The elective module includes all research and pre-graduation types of the internship (if any).

Within the higher education programme students also master other disciplines (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the internship.

Table 3.1. The list of the higher education programme components that contribute to the achievement of the expected learning outcomes as the internship results.

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
UC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, to develop an action strategy	Programming / Программирование Databases / Базы данных Advanced Methods of Remote Sensing and Geoinformation Systems / Совершенные методы дистанционного зондирования и геоинформационные системы Structures & Materials Modelling / Моделирование конструкций и материалов System Design / Системное проектирование Dynamics and Control of Space Systems / Динамика и управление космическими системами Machine Learning and Big Data Mining / Машинное обучение и анализ больших данных From Data Acquisition to Data Treatment / Сбор и обработка данных Technological Training / Технологическая практика Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация
UC-2	Able to manage a project at all stages of its life cycle.	Aerospace Systems / Аэрокосмические системы System Design / Системное проектирование Dynamics and Control of Space Systems / Динамика и управление космическими системами Applied Mechanics and Engineering / Прикладная механика и проектирование инженерных систем Systems	State final certification Государственная итоговая аттестация

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Engineering / Проектирование инженерных систем	
UC-3	Able to organize and manage the work of the team, developing a team strategy to achieve the goal.	Cross-Cultural Training / Межкультурная подготовка Technological Training / Технологическая практика	State final certification Государственная итоговая аттестация
UC-4	Able to apply modern communication technologies in the state language of the Russian Federation and foreign language(s) for academic and professional interaction.	French for Foreign Students / Французский язык как иностранный Cross-Cultural Training / Межкультурная подготовка English Language / Английский язык Russian for Foreign Students / Русский язык как иностранный	State final certification Государственная итоговая аттестация
UC-5	Able to analyze and take into account the diversity of cultures in the process of intercultural interaction.	Cross-Cultural Training / Межкультурная подготовка	State final certification Государственная итоговая аттестация
UC-6	Able to identify and implement the priorities of their own activities and ways to improve it based on self-assessment.	Cross-Cultural Training / Межкультурная подготовка Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация
UC-7	Able to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems; evaluate information, its reliability, build logical conclusions based on	Programming / Программирование Advanced Methods of Remote Sensing and Geoinformation Systems / Современные методы дистанционного зондирования и геоинформационные системы Machine Learning and Big Data Mining / Машинное обучение и анализ больших данных From Data Acquisition to Data Treatment / Сбор и обработка данных Virtual Reality and Computer Vision / Виртуальная реальность и компьютерное зрение Modelling and Validation / Моделирование и валидация	State final certification Государственная итоговая аттестация

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
	incoming information and data.		
GPC-2	Able to improve and implement new mathematical methods for solving applied problems.	Programming / Программирование	State final certification Государственная итоговая аттестация
GPC-3	Able to develop mathematical models and analyze them when solving problems in the field of professional activity.	Programming / Программирование Aerospace Systems / Аэрокосмические системы Structures & Materials Modelling / Моделирование конструкций и материалов System Design / Системное проектирование On-board Energy / Бортовая энергия Dynamics and Control of Space Systems / Динамика и управление космическими системами Technological Training / Технологическая практика	State final certification Государственная итоговая аттестация
GPC-4	Able to combine and adapt existing ones; information and communication technologies for solving problems in the field of professional activity, taking into account the requirements of information security.	Programming / Программирование Aerospace Systems / Аэрокосмические системы Structures & Materials Modelling / Моделирование конструкций и материалов System Design / Системное проектирование On-board Energy / Бортовая энергия Dynamics and Control of Space Systems / Динамика и управление космическими системами Technological Training / Технологическая практика	State final certification Государственная итоговая аттестация
PC-1	Able to formulate goals, tasks of scientific research in applied mathematics and computer science, computer engineering and modern programming technologies, to choose methods and means of problem solving.	Programming / Программирование Databases / Базы данных Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Technological Training / Технологическая практика	
PC-2	Able to apply modern theoretical and experimental methods to develop mathematical models of investigated objects and processes related to professional activity in the field of training and to participate in their implementation in the form of software products.	Programming / Программирование Databases / Базы данных Advanced Methods of Remote Sensing and Geoinformation Systems / Совершенные методы дистанционного зондирования и геоинформационные системы System Design / Системное проектирование Dynamics and Control of Space Systems / Динамика и управление космическими системами Machine Learning and Big Data Mining / Машинное обучение и анализ больших данных From Data Acquisition to Data Treatment / Сбор и обработка данных Applied Mechanics and Engineering / Прикладная механика и проектирование инженерных систем Systems Engineering / Проектирование инженерных систем Virtual Reality and Computer Vision / Виртуальная реальность и компьютерное зрение Modelling and Validation / Моделирование и валидация Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация
PC-3	Able to participate in research and development of design solutions in the field of ballistics, dynamics and flight control of spacecraft	Programming / Программирование Databases / Базы данных Advanced Methods of Remote Sensing and Geoinformation Systems / Совершенные методы дистанционного зондирования и геоинформационные системы System Design / Системное проектирование	State final certification Государственная итоговая аттестация

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Machine Learning and Big Data Mining / Машинное обучение и анализ больших данных From Data Acquisition to D Virtual Reality and Computer Vision / Виртуальная реальность и компьютерное зрение and Treatment / Сбор и обработка данных Modelling and Validation / Моделирование и валидация Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	
PC-4	Able to conduct work and research on processing and analysis of scientific and technical information in the field of application of mathematical methods and information technologies for creation of space products and provision of space services based on the use of remote sensing data and geoinformation systems	Aerospace Systems / Аэрокосмические системы Structures & Materials Modelling / Моделирование конструкций и материалов System Design / Системное проектирование On-board Energy / Бортовая энергия Dynamics and Control of Space Systems / Динамика и управление космическими системами Applied Mechanics and Engineering / Прикладная механика и проектирование инженерных систем Systems Engineering / Проектирование инженерных систем Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация
PC-5	Able to analyze, including in English, ballistic and dynamic	Advanced Methods of Remote Sensing and Geoinformation Systems / Современные методы дистанционного	State final certification Государственная итоговая аттестация

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
	characteristics research methods for modeling spacecraft trajectories.	зондирования и геоинформационные системы Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	
		English Language / Английский язык Advanced Methods of Remote Sensing and Geoinformation Systems / Современные методы дистанционного зондирования и геоинформационные системы Aerospace Systems / Аэрокосмические системы Structures & Materials Modelling / Моделирование конструкций и материалов System Design / Системное проектирование On-board Energy / Бортовая энергия Dynamics and Control of Space Systems / Динамика и управление космическими системами Applied Mechanics and Engineering / Прикладная механика и проектирование инженерных систем Systems Engineering / Проектирование инженерных систем Practical Training in Receiving Remote Sensing Data from Satellites and its Interpretation (online from RUDN Mission Control Center) / Научно-исследовательская работа Practical Training and Research in Dynamics and Control of Space Systems (online from RUDN Mission Control Center) / Научно-исследовательская работа	State final certification Государственная итоговая аттестация

* To be filled in according with the competence matrix of the higher education programme.

4. INTERNSHIP WORKLOAD

1)The total workload of the internship is 12 credits (432 academic hours).

Type of production work		Total, h	Semestr
			4
Contact work between the student and the teacher, including control		32	32
Other forms of production work, including keeping a practice diary and preparing a report for students		400	400
Type of certification test			Test with grade
Total labor intensity	academic hours	432	432
	credits	12	12
Duration of practice	weeks	8	8

5. INTERNSHIP CONTENTS

*Table 5.1. Internship contents**

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Section 1. Organizational and preparatory.	Receiving an individual practice assignment from a supervisor	10
	Safety training in the workplace (in the laboratory and/or in production)	2
Section 2. Research	Collection of analytical data in accordance with individual assignments. Description of application processes and software	100
	Analysis and processing of received data	100
	Professional skills in operating and maintaining operating systems, computer networks and services	100
	Current control of the internship by the supervisor	10
	Keeping an internship diary	2
Writing an internship report		2
Preparing for defence and defending the internship report		1
TOTAL:		432

* The contents of internship through modules and types of practical activities shall be FULLY reflected in the student's internship report.

6. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Scientific and educational laboratories of the Department of Mechanics and Control Processes, where students undergo practical training

7. INTERNSHIP LOCATION AND TIMELINE

The internship can be carried out at the structural divisions of RUDN University (at Moscow-based organisations, as well as those located outside Moscow).

The internship at an external organisation (outside RUDN University) is legally arranged on the grounds of an appropriate agreement, which specifies the terms, place and conditions for an internship implementation at the organisation.

The period of the internship, as a rule, corresponds to the period indicated in the training calendar of the higher education programme. However, the period of the internship can be rescheduled upon the agreement with the Department of Educational Policy and the Department for the Organization of Internship and Employment of RUDN students.

8. RESOURCES RECOMMENDED FOR INTERNSHIP

Main readings:

1. Demidovich, E.M. Basics of algorithmization and programming. SI language: Textbook. St. Petersburg: BHV-Petersburg, 2006. – 438 p.
2. Schildt, G. Complete reference book on C, 4th edition: - M.: Williams Publishing House, 2005. – 704 p.
3. Deitel, H.M. How to program in S/P.J. Deitel. M.: Binom, 2006 – 1037 p.
4. Golitsyna, O. Fundamentals of algorithmization and programming / I. Popov – St. Petersburg, 2003.
5. Knuth, D.E. The Art of Programming, Volume 1. Basic Algorithms, 3rd ed.: Transl. from English : Uch. Pos. – M.: Williams Publishing House, 2000. – 720 p. ill.
6. Himmelblau D. Applied nonlinear programming. – M.: Mir, 1975. – 534 p.
7. Shary S.P. Computational Methods Course. – Novosibirsk, SB RAS, 2016 – 531 p.
8. Kosarev V.I. 12 lectures on computational mathematics (introductory course). – M.: Fizmatkniga, 2013 – 240 p.
9. Classical and modern methods of automatic control theory. Textbook in 5 volumes; 2nd ed., revised. and additional / Ed. K.A. Pupkova, N.D. Egupova. – M.: Publishing house of MSTU im. N.E. Bauman, 2004.
10. Pupkov K.A. Modeling and testing of automatic control systems. Uch. allowance. – M.: RUDN, 2014. – 98 p.
11. Statistical methods of analysis: [textbook. manual] / I.S. Shorokhova, N.V. Kislyak, O.S. Ministry of Education and Science of Russia. Federation, Ural. federal univ. — Ekaterinburg: Ural Publishing House. University, 2015. - 300 p. https://elar.urfu.ru/bitstream/10995/36122/1/978-5-7996-1633-5_2015.pdf?ysclid=14u2yjs8u4979510421
12. Goryainova, E. R., Pankov, A. R., Platonov, E. N. Applied methods for analyzing statistical data [Text]: textbook. manual / E. R. Goryainova, A. R. Pankov, E. N. Platonov; National research University "Higher School of Economics". - M.: Publishing house. House of the Higher School of Economics, 2012. - 310, [2] p. — 1000 copies. - 978-5-7598-0866-4 (in the region). book.dvi (hse.ru)
13. Sutton Richard S., Barto Andrew G. Reinforcement Learning = Reinforcement Learning. — 2nd edition. - M.: DMK press, 2020. - 552 p. — ISBN 978-5-97060-097-9.
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Additional readings:

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2. Demidovich, E.M. Basics of algorithmization and programming. SI language: Textbook. St. Petersburg: BHV-Petersburg, 2006. – 438 p.

3. Shildt, G. Complete reference book on C, 4th edition: - M.: Williams Publishing House, 2005. – 704 p.

4. Gorev, A. E. Information technologies in professional activities (motor transport): textbook / A. E. Gorev. - M.: Yurayt Publishing House, 2017. - 271 p. -(Series: Vocational education). - ISBN 978-5-534-01603-1. - Access mode: www.biblio-online.ru/book/3C8B23E9-9ED1-49C7-BF65-0DA6C11347DF.

5. Modern computer technologies: textbook / R.G. Khismatov, R.G. Safin, D.V. Tuntsev, N.F. Timerbaev; Ministry of Education and Science of Russia, Federal State Budgetary Educational Institution of Higher Professional Education "Kazan National Research Technological University". - Kazan: KNRTU Publishing House, 2014. - 83 p.: diagrams. - Bibliography in the book - ISBN 978-5-7882-1559-4; Access mode: <http://biblioclub.ru/index.php?page=book&id=428016>

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Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

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

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

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

- EL "Student Consultant" www.studentlibrary.ru

- EL "Lan" <http://e.lanbook.com/>
- EL "Trinity Bridge"
-

2. *Databases and search engines:*

- electronic foundation 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.elsevier.com/locate/scopus/>
- The training toolkit and guidelines for a student to do an internship, keep an internship diary and write an internship report*:*

1. Safety regulations to do the internship (safety awareness briefing).
2. Machinery and principles of operation of technological production equipment used by students during their internship; process flow charts, regulations, etc. (if necessary).
3. Guidelines for keeping an internship diary and writing an internship report.

*The training toolkit and guidelines for the internship are placed on the internship page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL AS INTERNSHIP RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the internship results are specified in the Appendix to the internship syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

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