MINISTRYOF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution of Higher Education
"Far Eastern Federal University"
(FEFU)
INSTITUTE OF MATHEMATICS AND COMPUTER TECHNOLOGIES
(SCHOOL)

AGREED
Head of Educational
program
Shichalina V.A.

CONFIRM
Director of the Department of Information
and Computer Systems

Fedorets A.N.

WORKING PROGRAM OF THE DISCIPLINE
Statistical methods in information systems
Area of study 09.03.02 Information systems and technologies
(Digital footprint analytics)
Full-time training form

The work program was compiled in accordance with the requirements of the Federal State Educational Standard in the field of study 09.03.02 Information systems and technologies, approved by order of the Ministry of Education and Science of the Russian Federation dated September 19, 2017 No. 926 (as amended).

The work program was discussed at a meeting of the Department of Information and Computer Systems, protocol No. 4 of February 03, 2023.

Director of the Department of Information and Computer Systems Fedorets F.N.

Compiled by: Zlobina Yu.A.

Vladivostok
2023

1.The work program was revised at a meeting of the Department of Information and Computer Systems and approved at a meeting of the Department
information and computer systems, protocol from "   »   *20_g. No.*

2.   The work program has been revised to   meeting   Department
information and computer systems and approved at a meeting of the Department
information and computer systems, protocol from "   »   *20_g. No.*

3.   The work program has been revised to   meeting   Department
information and computer systems and approved at a meeting of the Department
information and computer systems, protocol from "   »   *20_g. No.*

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5.   The work program has been revised to   meeting   Department
information   and computer systems and approved at a meeting of the Department
information and computer systems, protocol from "   »   *20_g. No.*

Discipline abstract

Statistical methods in information systems

The total labor intensity of the discipline is 4 credit units / 144 academic hours. It is a discipline of the part formed by the participants of educational relations, EP, is studied in the 3rd year and ends with an exam. The curriculum provides for lectures in the amount of 32 hours, practical classes in the amount of 64 hours (including 18 hours in an interactive form), and hours are allocated for independent work of the student - 48 hours (including 27 hours for preparing for exams) .

Implementation language:
Russian

Target:

Formation of basic concepts and methods of mathematical statistics among students; formation of a special knowledge system based on the use of statistical methods in the study of mass phenomena and processes in information systems; acquisition by students of the skills of statistical analysis in the field of information systems and technologies; preparation of students for the study of related applied and special courses using statistical methods.

Tasks:

- study of the basic concepts of mathematical statistics;

- mastery of a complex of modern statistical methods of collection, systematization and analysis of information to study trends and patterns in information systems;

- mastering methods for calculating the most important statistical indicators necessary for planning, accounting and analyzing various processes in information systems;

- training in the ability to detail, systematize, determine the influence of various factors on processes in information systems;

- acquisition of skills and abilities to use statistical methods in

practical situations, to make sound management decisions in the development of innovative projects,

- acquisition of statistical analysis skills in the field of domestic and foreign information systems,

- formation of the necessary competencies for professional activities.

For the successful study of the discipline, students should have the following preliminary competencies: GPC-1.1, GPC-1.2, GPC-1.3, GPC-2.1, GPC-2.2, GPC-2.3, UK-1.1, UK-1.2, UK-1.3 obtained as a result of studying the disciplines of Probability Theory, Linear Algebra and Analytic Geometry, Fundamentals of Algorithmization and Programming.

Competences of students, indicators of their achievement and learning outcomes in the discipline

Task type	Code and name professional competencies (result of development)	Code and name indicator achievements competencies	Name of indicator assessment (learning outcome by discipline)
scientific research spruce	PC-1 Capable conduct research information systems and technologies, analyze scientific and technical information and results experiments	PC-1.1 Collects, processes, analyzes and summarizes the results experiments and research, domestic and international experience in the field information systems and technologies	Knows the methodological basis collection, processing of results research in the field information systems and technologies Ability to summarize results experiments and research in information systems and technology Proficient in analysis domestic and foreign experience in information systems and technologies
		PC-1.2 Conducts experiments and draws up results research and developments in the field information systems and technologies	Knows the methods experiments in the field information systems and technologies Ability to select appropriate results reporting methods research at all stages life cycle information systems Possesses substantiation skills

			choice of applied methods research
		PC-1.3 Capable develop projects calendar plans and programs	Knows the principles of formation research plans in information systems and technology Ability to develop programs

		holding individual elements scientific research and experimental design works	conducting research in information systems and technology Possesses development skills draft schedules and individual elements of scientific research and experimental design work
production tvenno-technologist s chesky	PC-7 Capable analyze digital footprint person (group people) and information and communication systems	PC-7.1 Collects and prepares digital data trace for holding analysis	Knows the structure and sources digital footprint, methods data preprocessing Ability to collect and digital data preprocessing trace Skilled in collecting and digital data preparation trace for analysis
		PC-7.2 Checks hypotheses and reveal patterns in data arrays	Knows processing algorithms data, software, libraries and frameworks for data analysis Ability to apply algorithms data processing, specialized software data analysis software Possesses verification skills hypotheses and search for patterns in data arrays
		PC-7.3 renders analysis results digital footprint	Knows visual techniques data display, specialized software visualization software data Knows how to apply specialized software software, libraries and visualization frameworks data Possesses visualization skills digital trace
production tvenno-technologist s chesky	PC-8 Capable conduct analytical research with application big technologies data	PC-8.1 Defines sources of great data for analysis, retrieve, check and clear the data	Knows the sources of big data, storage and processing technologies big data Able to extract cleaning, integration and large volume conversion data Possesses skills of definition big data sources for

			analysis, extraction skills, data validation and cleaning
		PC-8.2 Analyzes and choose methods and instrumental analysis tools big data	Knowledge of theoretical and applied basics of big data analysis, modern methods and tools big data analysis Ability to select appropriate methods and instrumental tools for analyzing large
			data Proficient in comparative analysis and informed choice methods and instrumental big data analytics
		PC-8.3 Conducts analytical work with using big technologies data	Knowledge of theoretical and applied basics of big data analysis, data analysis technologies Ability to plan and execute analytical work with technology big data Has the skills to conduct analytical work with technology big data

For the formation of the above competencies within the discipline "Statistical Methods in Information Systems" the following educational technologies and methods of active / interactive learning are used: lecture-conversation, lecture-discussion, case analysis method, work in small groups.

I.Goals and objectives of mastering the discipline:

Target:

Formation of basic concepts and methods of mathematical statistics among students; formation of a special knowledge system based on the use of statistical methods in the study of mass phenomena and processes in information systems; acquisition by students of the skills of statistical analysis in the field of information systems and technologies; preparation of students for the study of related applied and special courses using statistical methods.

Tasks:

- study of the basic concepts of mathematical statistics;

- mastery of a complex of modern statistical methods of collection, systematization and analysis of information to study trends and patterns in information systems;

- mastering methods for calculating the most important statistical indicators necessary for planning, accounting and analyzing various processes in information systems;

- training in the ability to detail, systematize, determine the influence of various factors on processes in information systems;

- acquisition of skills and abilities to use statistical methods in practical situations, to make sound management decisions in the development of innovative projects,

- acquisition of statistical analysis skills in the field of domestic and foreign information systems,

- formation of the necessary competencies for professional activities.

The place of the discipline in the structure of the OBEP HE (in the curriculum):

This discipline is included in the section "Block 1. Disciplines (modules)" of the main professional educational program 09.03.02 Information systems and technologies (Programming of robotic systems). Refers to part of the curriculum

plan formed by the participants of educational relations.

Based on knowledge of the following disciplines: Probability theory, Linear algebra and analytical geometry, Fundamentals of algorithmization and programming.

Acquired in the 3rd year in the 5th semester.

Professional competencies of students, indicators of their achievement and learning outcomes in the discipline

Task type	Code and name professional competencies (result of development)	Code and name indicator achievements competencies	Name of indicator assessment (learning outcome by discipline)
scientific research spruce	PC-1 Capable conduct research information systems and technologies, analyze scientific and technical information and results experiments	PC-1.1 Collects, processes, analyzes and summarizes the results experiments and research, domestic and international experience in the field information systems and technologies	Knows the methodological basis collection, processing of results research in the field information systems and technologies Ability to summarize results experiments and research in information systems and technology Proficient in analysis domestic and foreign experience in information systems and technologies
		PC-1.2 Conducts experiments and draws up results research and developments in the field information systems and technologies	Knows the methods experiments in the field information systems and technologies Ability to select appropriate results reporting methods research at all stages life cycle information systems Possesses substantiation skills choice of applied methods research
		PC-1.3 Capable develop projects calendar plans and programs holding individual elements	Knows the principles of formation research plans in information systems and technology Ability to develop programs conducting research in information systems

		scientific research and experimental design works	and technology Possesses development skills draft schedules and individual elements of scientific research and experimental design work
production tvenno-technologists	PC-7 Capable analyze digital footprint	PC-7.1 Collects and prepares digital data	Knows the structure and sources digital footprint, methods data preprocessing

chesky	person (group people) and information and communication systems	trace for holding analysis	Ability to collect and digital data preprocessing trace Skilled in collecting and digital data preparation trace for analysis
		PC-7.2 Checks hypotheses and reveal patterns in data arrays	Knows processing algorithms data, software, libraries and frameworks for data analysis Ability to apply algorithms data processing, specialized software data analysis software Possesses verification skills hypotheses and search for patterns in data arrays
		PC-7.3 renders analysis results digital footprint	Knows visual techniques data display, specialized software visualization software data Knows how to apply specialized software software, libraries and visualization frameworks data Possesses visualization skills digital trace
production tvenno-technologists chesky	PC-8 Capable conduct analytical research with application big technologies data	PC-8.1 Defines sources of great data for analysis, retrieve, check and clear the data	Knows the sources of big data, storage and processing technologies big data Able to extract cleaning, integration and large volume conversion data Possesses skills of definition big data sources for analysis, extraction skills, data validation and cleaning
		PC-8.2 Analyzes and choose methods and instrumental analysis tools big data	Knowledge of theoretical and applied basics of big data analysis, modern methods and tools big data analysis Ability to select appropriate methods and instrumental tools for analyzing large data Proficient in comparative analysis and informed choice methods and instrumental

			big data analytics
		PC-8.3 Conducts analytical work with using big technologies data	Knowledge of theoretical and applied basics of big data analysis, data analysis technologies Ability to plan and execute analytical work with technology big data Has the skills to conduct

			analytical work with technology big data

II. The complexity of the discipline

The total labor intensity of the discipline is 4 credit units (144 academic hours). 1 credit unit corresponds to 36 academic hours.

III. Discipline structure:

Full-time form of education.

No.	Section name disciplines	Semestr	Number of hours by type of training classes and work of the student						Forms intermediate attestations
			Lek	Lab	Etc	OK	SR	Comte role	
1	Introduction. historical reference.	5	2	-		-	21	27	*exam*
2	Basics of the theory statistics	5	10	-	22				
3	Statistical Methods data processing	5	20	-	42				
	Total:		**32**	**-**	**64**	**-**	**21**	**27**	***144***

IV. CONTENT OF THE THEORETICAL PART OF THE COURSE

1. Introduction. Historical reference. Goals, tasks, types. Research stages.
2. Fundamentals of the theory of statistics
    2.1. Descriptive statistics.

    General population. Sample. Variational
    and statistical series. Selective
    numerical characteristics.

2.2. Distribution parameter estimates Definition and properties of a statistical estimate. Point estimates of unknown parameters.

Interval estimates of unknown parameters.

2.3. Laws of distribution of random variables.

Even distribution.

Normal distribution.

Laplace distribution.

Generalized exponential distribution.

Cauchy distribution.

Rayleigh distribution.

Exponential distribution.

Log-normal distribution.

Pareto distribution.

Binomial distribution.

3. Statistical methods of data processing.

3.1. Testing statistical hypotheses. The concept
of statistical hypothesis.

Testing hypotheses about the numerical values of the
parameters. Testing the hypothesis about the equality of the
shares of the attribute. Testing the hypothesis about the
type of distribution.

Pearson's goodness-of-fit test. 3.2.

Correlation analysis.

The concept of correlation. Problems of correlation analysis Selective coefficient of
linear correlation and its properties. Significance of the sample linear correlation
coefficient.

Calculation of the sample coefficient of linear correlation. Confidence interval for
the correlation coefficient. Correlation and causality. Rank correlation. Spearman's
rank correlation coefficient.

3.3. Regression analysis.

Approximation models. Determination of the parameters of approximating
functions by the method of least squares. Fisher's criterion for checking the
adequacy of the model.

Assessment of the significance of regression parameters. 3.4. Random number generators.

Physical, tabular, algorithmic RNG. Method of mid-squares, median products, mixing, linear congruent method. Fibonacci method, Lehmer's algorithm, Mersenne's vortex.

V. CONTENT OF THE PRACTICAL PART OF THE COURSE

Practical lessons

1. Python structure. Representation and display of data. Pandas library. Matplot library.
2. Descriptive statistics. Sample. Variational and statistical series in Excel.
3. Selective numerical characteristics in Excel.
4. Laws of distribution of a discrete random variable in Excel.
5. Laws of distribution of a continuous random variable in Excel.
6. Confidence interval for the mathematical expectation with a known standard deviation.
7. Confidence interval for the mathematical expectation with an unknown standard deviation.
8. Testing hypotheses about the numerical values of the parameters.
9. Comparison of the sample mean with the hypothetical population mean of a normal population.
10. Testing hypotheses about the equality of the numerical characteristics of populations.
11. Finding point estimates of distribution parameters.
12. Numpy library. Actions with arrays. Statistics in NumPy.
13. The random module in Python.
14. Visualization. Random walk method.
15. Python. Discrete probability distributions. Uniform distribution, Bernoulli distribution, binomial distribution.
16. Python. Continuous probability distributions.
17. Probability density, mathematical expectation, variance. Normal distribution.
18. Python. Categorical (qualitative) data. quantitative data. Averages (arithmetic mean, median, mode).
19. Python. Statistical inference tools. Confidence interval.
20. Python. Hypothesis testing. Student's criterion. Pair tests.

21. Python. Linear models, multiple factors.
22. Correlation. Forecasting.
23. Python. Regression. Loading data. Data preprocessing. Exploratory data analysis. Selection and extraction of features. Training and evaluation of the quality of the model.

VI.CONTROL OF ACHIEVEMENT OF COURSE OBJECTIVES

No. p/p	controlled sections/topics disciplines	Code and Name indicator achievements	Learning Outcomes	Evaluation tools *	
				current control	Intermediate accurate attestation
1	All sections and topics.	PC-1.1	Knows methodological collection basis, statistical processing research results. Can generalize results statistical experiments. Skilled statistical analysis in information systems	UO-1 UO-3 PR-2 PR-7 PR-9 PR-12 PR-13 PR-14	-
		PC-1.2	Knows statistical methods of conducting experiments in the field information systems and technologies Knows how to choose appropriate methods presentation of results research on all life cycle stages information systems Skilled rationale for choice applied methods research		
		PC-1.3	Knows the principles formation of plans		

			statistical research in the field information systems and technologies Able to develop		
			programs for statistical research in the field information systems and technologies Skilled project development and programs for individual elements research and development works		
		PC-7.1	knows the structure and digital footprint sources, preprocessing methods data Ability to collect and data preprocessing digital footprint Skilled in collecting and data preparation digital footprint for analysis	UO-1 UO-3 PR-2 PR-7 PR-9 PR-12 PR-13 PR-14	–
		PC-7.2	Knows processing algorithms data, software software, libraries and analysis frameworks data Knows how to apply processing algorithms data, specialized software for data analysis Possesses verification skills hypotheses and search patterns in data arrays		
		PC-7.3	Knows visual techniques data display, specialized software for data visualization Knows how to apply		

			specialized software, libraries and frameworks for data visualization Skilled visualization of results digital footprint analysis		
		PC-8.1	Knows the sources of data, technology	UO-1	-

Exam

	storage and processing big data	UO-3	
	Can produce extraction, cleaning, integration and large conversion volumes of data	PR-2	
		PR-7	
		PR-9	
	Skilled source definitions big data for analysis, skills extraction, verification and data cleaning	PR-12	
		PR-13	
		PR-14	
PC-8.2	Knows theoretical and applied fundamentals of analysis big data, modern methods and tools big data analysis		
	Knows how to choose appropriate methods and tools to analyze large data		
	Skilled benchmarking and informed choice methods and tools big data analysis		
PC-8.3	Knows theoretical and applied fundamentals of analysis big data, data analysis technologies		
	Can plan and conduct analytical work using big technologies data		
	Skilled analytical works using big technologies data		
PC-1.1 PC-1.2 PC-1.3 PC-7.1 PC-7.2 PC-7.3		-	PR-1

PC-8.1 PC-8.2 PC-8.3			

1) interview (SW-1), colloquium (SW-2); report, message (UO-3); round table, discussion, controversy, dispute, debate (UO-4); etc.

2) tests (PR-1); control works (PR-2), essays (PR-3), abstracts (PR-4), term papers (PR-5); laboratory work (PR-6); abstract (PR-7); portfolio (PR-8); draft (WP-9); business and / or role-playing game (PR-10); case-task (PR-11); workbook (PR-12); multilevel tasks assignments (PR-13); settlement and graphic work (PR-14); creative task (PR-15), etc. и

3) simulator (TS-1), etc.

V. EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' INDEPENDENT WORK

Independent work is defined as an individual or collective learning activity carried out without the direct guidance of a teacher, but according to his instructions and under his control. Independent work is a cognitive learning activity, when the sequence of a student's thinking, his mental and practical operations and actions depends and is determined by the student himself.

Independent work of students contributes to the development of independence, responsibility and organization, a creative approach to solving educational problems. professional levels, which ultimately leads to the development of the skill of independent и planning and implementation of activities.

The purpose of independent work of students is to master the necessary competencies in their field of study, experience in creative and research activities.

Forms of independent work of students:

- work with basic and additional literature, Internet resources;
- self-acquaintance with the lecture material presented on electronic media in the library of an educational institution;
- preparation of abstract reviews of sources of periodicals, reference notes, predetermined by the teacher;
- search for information on the topic with its subsequent presentation to the audience in the form of a report, presentations;
- preparation for the implementation of classroom control work;
- performance of home control works;
- performance of test tasks, problem solving;
- drawing up crossword puzzles, schemes;

preparation of reports for presentation at a seminar, conference;   -

filling out a workbook;   -

- essay writing, term paper;

- preparation for business and role-playing games;

- compiling a resume;

- preparation for tests and exams;

- other activities organized and carried out by the educational

institution and student self-government bodies.

When performing a number of tasks, it is required to work with literature. Recommended

use various opportunities for working with literature: scientific library collections

FEFU (http://www.dvfu.ru/library/) and other leading universities of the country, as well as available for

use of scientific library systems.

VIII.   REFERENCES AND INFORMATION AND METHODOLOGICAL SUPPORT OF THE DISCIPLINE

Main literature

1. Fundamentals of the theory of statistics: [proc. allowance] / V. V. Polyakova, N. V. Shabrova; Ministry of Education and Science Ros. Federation, Ural. feder. un-t. - 2nd ed., Rev. and additional - Yekaterinburg: Ural Publishing House. un-ta, 2015. - 148 p.

2. Fundamentals of statistical analysis and data processing using Microsoft Excel: textbook. allowance / T. V. Borzdova. - Minsk: GIUST BGU, 2011. - 75 p.

3. Statistical calculations on the Jupyter Notebook platform using Python: textbook / S.Ya. Krivolapov. - Moscow: KNORUS, 2022. - 432 p.

4. Practical statistics for Data Science specialists: Per. from English. / P. Bruce, E. Bruce. - St. Petersburg: BHV-Petersburg, 2018. - 304 p.

5. Fundamentals of statistical analysis and data processing using Microsoft Excel: textbook. allowance / T. V. Borzdova. - Minsk: GIUST BGU, 2011. - 75 p.

6.Mkhitaryan, V.S. Probability theory and mathematical statistics [Electronic resource]: textbook. allowance / V. S. Mkhitaryan, E. V. Astafieva, Yu. N. Mironkina, L. I. Troshin; ed. V. S. Mkhitaryan. - 2nd ed., revised. and additional - M.:
Moscow   Financial   and   Industrial   University   "Synergy", 2013.http://znanium.com/go.php?id=451329

7. Gmurman VE Probability Theory and Mathematical Statistics Textbook for High Schools. - 12th ed., revised. - M.: Higher education, 2008. - 479 p. http://lib.dvfu.ru:8080/lib/item?id=Lan:Lan-91078&theme=FEFU

8. Arkashov N.S., Kovalevsky A.P. Probability theory and random processes - Novosibirsk: NGTU, 2014. - 238 p. http://lib.dvfu.ru:8080/lib/item?id=Znanium:Znanium-546213&theme=FEFU

additional literature

1. S. E. Demin, E. L. Demina. Mathematical statistics: textbook-method. allowance / Ministry of Education and Science of the Russian Federation; FGAOU VO "UrFU im. the first President of Russia B.N. Yeltsin, Nizhny Tagil. technol. in-t (fil.). - Nizhny Tagil: NTI (branch) UrFU,
2016. - 284 p.

2. Moizes, B. B. Statistical methods of quality control and processing of experimental data: a textbook for secondary vocational education / B. B. Moizes, I. V. Plotnikova, L. A. Redko. - 2nd ed. - Moscow: Yurayt Publishing House, 2023. - 118 p. Ventzel E.S., Ovcharov L.A. Probability theory and
e engineering applications: textbook. - Ed. 4th, sr. - M .: Higher school,
2007. - 491 p.

3. Probability Theory, Mathematical Statistics and Stochastic Processes: Textbook / Katsman Yu.Ya. - Tomsk: Publishing House of the Tomsk Polytechnic University. University, 2013. - 131 p.

List of resources of the information and telecommunications network "Internet"

1. Statistics. Educational site. -https://stat-ist.ru/
2. Federal State Statistics Service – https://rosstat.gov.ru/
3. Volodin I.N. Lectures on the theory of probability and mathematical statistics.https://kpfu.ru/docs/F1021260618/TViMS.pdf
4. Theory of Probability and Mathematical Statistics. Portalhttp://statistica.ru/theory/

List of information technologies and software

Windows 10 Pro operating system, software for working with electronic

tables   Microsoft Excel,   platform jupyter Notebook,
    communication networks

worldwide system of interconnected computer networks Internet, interactive cloud

Google Colab environment.

IX.METHODOLOGICAL INSTRUCTIONS FOR MASTERING THE DISCIPLINE

Successful mastering of the discipline involves the active work of students

in all classes of the classroom form: lectures and practices, performance of attestation events. In the process of studying the discipline, the student must focus on elaboration of lecture material, preparation for practical exercises, implementation control and creative work.

Mastering the discipline involves a rating system for assessing students' knowledge и provides on the part of the teacher the current control over the attendance of lectures by students, the preparation and implementation of all practical tasks, performing all kinds of independent work.

An intermediate certification in the discipline is an exam.

A student is considered certified in the discipline, provided that all types of current control and independent work provided for by the curriculum are performed.

The scale for assessing the formation of educational results in the discipline is presented in the fund of evaluation tools (FOS).

X. LOGISTICS AND TECHNICAL SUPPORT OF THE DISCIPLINE

Training sessions in the discipline are held in rooms equipped with appropriate equipment and software.

The list of material, technical and software of the discipline is given in the table.

Logistics and software discipline

Name special premises and premises for independent work	Equipment special rooms and premises for independent work	List of licensed software. Details of the confirming document
Lecture audience D208/347, D303, D313a, D401, D453, D461, D518, D708, D709, D758, D761, D762, D765, D766, D771, D917, D918, D920, D925, D576, D807	Marker board, audio player	IBM SPSS Statistics Premium campus edition. Supplier CJSC predictive solutions. Contract EA-442-15 dated January 18, 2016 License - indefinitely. SolidWorks Campus 500. Supplier Solid Works R. Agreement 15-04-101 dated December 23, 2015 License - indefinitely. ASCON Compass 3D v17. Navicom supplier. Agreement 15-03-53 dated 12/20/2015 d. License - indefinitely. MathCad Education Universety Edition. Soft Line Supplier Trade. Agreement 15-03-49 dated December 2, 2015 License - indefinitely. Windows Edu Per

		Device 10 Education. Provider
		Microsoft. Договор № ЭА-261-18 от 30.06.2018 г. Срок действия договора с 30.06.2018 г. Office Professional Plus 2019. Поставщик Microsoft. Договор № ЭА261-18 от 30.06.2018 г. Лицензия - бессрочно. Autocad 2018. Поставщик Autodesk. Договор № 110002048940 от 27.10.2018 г. Сетевая, конкурентная. Срок действия договора с 27.10.2018 г. Сублицензионное соглашение Blackboard № 2906/1 от 29.06.2012
Мультимедийные аудитории: D229, D304, D306, D349, D350, D351, D352, D353, D403, D404, D405, D414, D434, D435, D453, D503, D504, D517, D522, D577, D578, D579, D580, D602, D603, D657, D658, D702, D704, D705, D707, D721, D722, D723, D735, D736, D764, D769, D770, D773, D906, D914, D921, D922, D923, D924, D926	Проектор Mitsubishi EW330U, Экран проекционный ScreenLine Trim White Ice, профессиональная ЖК-панель 47", 500 Кд/м2, Full HD M4716CCBA LG, подсистема видеоисточников документ-камера CP355AF Avervision; подсистема видеокоммутации; подсистема аудиокоммутации и звукоусиления; подсистема интерактивного управления	IBM SPSS Statistics Premium Campus Edition. Поставщик ЗАО Прогностические решения. Договор ЭА-442-15 от 18.01.2016 г. Лицензия - бессрочно. SolidWorks Campus 500. Поставщик Солид Воркс Р. Договор 15- 04-101 от 23.12.2015г. Лицензия - бессрочно. АСКОН Компас 3D v17. Поставщик Навиком. Договор 15-03-53 от 20.12.2015 г. Лицензия - бессрочно. MathCad Education Universety Edition. Поставщик Софт Лайн Трейд. Договор 15-03-49 от 02.12.2015 г. Лицензия - бессрочно. Windows Edu Per Device 10 Education. Поставщик Microsoft. Договор № ЭА-261-18 от 30.06.2018 г. Срок действия договора с 30.06.2018 г. Office Professional Plus 2019. Поставщик Microsoft. Договор № ЭА261-18 от 30.06.2018 г. Лицензия - бессрочно. Autocad 2018.

		Поставщик Autodesk. Договор № 110002048940 от 27.10.2018 г. Сетевая, конкурентная. Срок действия договора с 27.10.2018 г. Сублицензионное соглашение Blackboard № 2906/1 от 29.06.2012г.
Мультимедийные аудитории; D207/346	Проектор 3chip DLP, 10 600 ANSI-лм, WUXGA 1 920x1 200 (16:10) PT-DZ110XE Panasonic; экран 316x500 см, 16:10 с эл. приводом; крепление настенно-потолочное	IBM SPSS Statistics Premium Campus Edition. Поставщик ЗАО Прогностические решения. Договор ЭА-442-15 от 18.01.2016 г. Лицензия - бессрочно. SolidWorks Campus
	Elpro Large Electrol projecta; professional LCD panel 47", 500 cd/m2, Full HD M4716CCBA LG; video source subsystem document- CP355AF Avervision camera; video switching subsystem; subsystem audio switching and sound amplification; interactive management),	500. Supplier Solid Works R. Agreement 15-04-101 dated December 23, 2015 License - indefinitely. ASCON Compass 3D v17. Provider Navik. Agreement 15-03-53 dated December 20, 2015 License - indefinitely. MathCad Education Universe Edition. Provider Soft Line Trade. Contract 15-03-49 dated 02.12.2015 License - indefinitely. Windows Edu Per Device 10 Education. Provider Microsoft. Agreement No. EA-261-18 dated June 30, 2018 Validity period contracts from 30.06.2018 Office Professional Plus 2019. Vendor Microsoft. Contract No. EA261-18 dated 06/30/2018 License - indefinitely. AutoCAD 2018. Autodesk vendor. Agreement No. 110002048940 dated 10/27/2018 Network, competitive. Term the validity of the contract from 27.10.2018
multimedia audiences: D447, D448, D449, D450, D451, D452, D502, D575	Projector Mitsubishi EW330U, Screen projection ScreenLine Trim White Ice Subsystem document camera video sources CP355AF Avervision; subsystem video switching; subsystem audio switching and sound amplification;	IBM SPSS Statistics Premium campus edition. Supplier CJSC predictive solutions. Contract EA-442-15 dated January 18, 2016 License - indefinitely. SolidWorks Campus 500. Supplier Solid Works R. Agreement 15-04-101 dated December 23, 2015

	interactive management	License - indefinitely. ASCON Compass 3D v17. Provider Navik. Agreement 15-03-53 dated December 20, 2015 License - indefinitely. MathCad Education Universe Edition. Provider Soft Line Trade. Contract 15-03-49 dated 02.12.2015 License - indefinitely. Windows Edu Per Device 10 Education. Provider Microsoft. Agreement No. EA-261-18 dated June 30, 2018 Validity period contracts from 30.06.2018 Office Professional Plus 2019. Vendor Microsoft. Contract No. EA261-18 dated 06/30/2018 License - indefinitely. AutoCAD 2018. Autodesk vendor. Agreement No. 110002048940 dated 10/27/2018 Network, competitive. Term
		validity of the contract from 27.10.2018
multimedia audience, Computer Class D446, D604, D656, D659, D737, D808, D809, D812	Multimedia Audience: Projector Mitsubishi EW330U, Screen projection ScreenLine Trim White Ice, professional LCD panel 47", 500 cd/m2, Full HD M4716CCBA LG subsystem document camera video sources CP355AF Avervision; subsystem video switching; subsystem audio switching and sound amplification; subsystem interactive control; Computer class; Workplace: Computers (Solid State Disk - 128 GB; Hard disk - volume 1000 GB; Form factor - Tower); Comes with keyboard and mouse. AOS monitor i2757Fm; set of cords nutrition) Model - M93r 1; language class,	IBM SPSS Statistics Premium campus edition. Supplier CJSC predictive solutions. Contract EA-442-15 dated January 18, 2016 License - indefinitely. SolidWorks Campus 500. Supplier Solid Works R. Agreement 15-04-101 dated December 23, 2015 License - indefinitely. ASCON Compass 3D v17. Provider Navik. Agreement 15-03-53 dated December 20, 2015 License - indefinitely. MathCad Education Universe Edition. Provider Soft Line Trade. Contract 15-03-49 dated 02.12.2015 License - indefinitely. Windows Edu Per Device 10 Education. Provider Microsoft. Agreement No. EA-261-18 dated June 30, 2018 Validity period contracts from 30.06.2018 Office Professional Plus 2019. Vendor Microsoft. Contract No. EA261-18

	computers are equipped with software complex Sanako study 1200	dated 06/30/2018 License - indefinitely. AutoCAD 2018. Autodesk vendor. Agreement No. 110002048940 dated 10/27/2018 Network, competitive. Term the validity of the contract from 27.10.2018 Sublicense Agreement Blackboard No. 2906/1 dated 06/29/2012
audience for independent student work A1042	Monoblock Lenovo C360G-i34164G500UDK-115 pieces; Integrated touch Polymedia FlipBox display; Copier printercolor scanner to e-mail with 4 Xerox trays WorkCentre 5330 (WC5330C; Full color copier-printer-scanner Xerox WorkCentre 7530 (WC7530CPS Equipment for disabled people and people with disabilities health features: Display Braille Focus-40 Blue - 3 pcs.; Display Braille Focus-80 Blue; Work station Lenovo ThinkCentre E73z - 3 pcs.; Videos magnifier ONYX Swing-Arm PC edition; Marker recorder Touch Memo digital;	Microsoft Windows 7 Pro Magic 12.0 Pro, Jaws for Windows 15.0 Pro, Openbook 9.0, Duxbury Braille Translator, Dolphin Guide (Contract No. A238-14/2); Non-exclusive rights to use of Microsoft software user workstations (contract EA-261-18 dated 02.08.2018): - license for client operating room system; - package license office products to work with documents - license for the right user connection to server operating systems, used in FEFU: Microsoft Windows Server 2008/2012; - license to connect to
	Portable Reader flat-printed texts PEarl; Scanning and reading machine for the blind and visually impaired users SARA; Braille Printer Emprint SpotDot - 2 pcs.; Braille printer Everest-D V4; Video Enlarger ONYX Swing-Arm PC edition; Video magnifier Topaz 24" XL stationary electronic; educational system for children tactile and speech, or for people with disabilities health opportunities;	Microsoft Exchange Server Enterprise; - license for the right connection to the internal information system document management and portal with search capability lots of information remote and local repositories, resources, information libraries, including portal storages, used in FEFU: Microsoft SharePoint; - license for the right system connections centralized management workstations, used in FEFU: Microsoft system center.

		RUBY Hand Video Magnifier portable - 2 pcs.; Samsung screen S23C200B; Marker Voice Recorder Touch Memo digital.	