



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.04.02 Applied Mathematics and Informatics

Educational Programme "Data Science"

Trajectories: "Artificial Intelligence and Data Analysis", "Artificial Intelligence and Information Transmission (AIIT)"

Implementing unit: Faculty of Computer Science, HSE - Moscow

Years of Study: 2022/2023 - 2023/2024

Length of Programme: 2 years

Mode of Study: Full Time

Degree: Master's degree / MBA

APPROVED

18.05.2022

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Block Code	Course	Subject type	Credits	Credits by Years		Planned Educational Programme Development Results
				1	2	
	Degree Programme		120,00	60,00	60,00	
	Artificial Intelligence and Data Analysis (General track)		114,00	60,00	60,00	
	Key Seminars		15,00	9,00	6,00	
1	Mentor's Seminar (offered in a foreign language)	C	6,00	3,00	3,00	PC-1, PC-2, PC-4, PC-5, PC-6, PC-7, PC-9, UC-6
2	Research Seminar "Number Theoretic and Algebraic Methods in Data Analysis" (offered in a foreign language)	C	9,00	6,00	3,00	GPC-1, GPC-3, PC-1, PC-4, PC-6, PC-7, UC-1, UC-3, UC-4, UC-6
	Internship		15,00	3,00	12,00	
	Project Internship		3,00	3,00		
1	Term Paper	C	3,00	3,00		GPC-2, GPC-3, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-9, UC-1, UC-2, UC-3, UC-6
	Research Internship		12,00		12,00	
1	Preparation of Graduation Thesis	C	12,00		12,00	GPC-1, GPC-2, GPC-3, PC-1, PC-10, PC-2, PC-4, PC-5, PC-6, PC-7, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		72,00	42,00	30,00	
	Compulsory Disciplines 1 Academic Year		18,00	18,00		
1	Modern Methods of Decision Making (offered in a foreign language)	C	6,00	6,00		UC-1, UC-2, UC-3
2	Ordered Sets in Data Analysis (offered in a foreign language)	C	6,00	6,00		GPC-1, UC-1, UC-2, UC-3

3	Linear Algebra for Data Science (offered in a foreign language)	C	6,00	6,00		GPC-1, GPC-3, GPC-4, PC-2, PC-6, UC-3, UC-4
Elective Courses 1st year			24,00	24,00		
1	Discrete Mathematics for Application and Algorithm Development (offered in a foreign language)	E	3,00	3,00		UC-1, UC-2, UC-3
2	Probability Theory and Mathematical Statistics (offered in a foreign language)	E	3,00	3,00		UC-1, UC-2, UC-3
3	Modern Methods of Data Analysis (offered in a foreign language)	E	6,00	6,00		GPC-3, UC-1, UC-2, UC-5
4	Network Science (offered in a foreign language)	E	6,00	6,00		GPC-1, UC-1, UC-2, UC-3
5	Geospatial Data Science (offered in a foreign language)	E	6,00	6,00		GPC-1, UC-1, UC-2, UC-3
6	Decision Making and Data Analysis under Uncertainty and Ambiguity	E	6,00	6,00		GPC-2, UC-3, UC-4
7	Games and Decisions in Data Analysis and Modelling (offered in a foreign language)	E	6,00	6,00		UC-1, UC-2, UC-3
8	Robust Methods in Statistics	E	6,00	6,00		GPC-2, UC-1, UC-3
9	Natural Language Processing on Python (offered in a foreign language)	E	6,00	6,00		GPC-3, PC-10
10	Applied Quantitative Logistics (offered in a foreign language)	E	6,00	6,00		GPC-2, PC-10, UC-1, UC-2, UC-3
11	Computational Linguistics and Text Analysis	E	6,00	6,00		GPC-2, PC-10, UC-1, UC-2, UC-3
12	Machine Learning	E	12,00	12,00		GPC-1, GPC-2, UC-1, UC-2, UC-3
Compulsory Disciplines 2 course			6,00		6,00	
1	Machine Learning and Data Mining (offered in a foreign language)	C	6,00		6,00	GPC-1, UC-1, UC-2, UC-3
Elective courses 2 year			24,00		24,00	
1	How to Examine and Predict Time Series: Methods and Applications (offered in a foreign language)	E	6,00		6,00	GPC-2, PC-10, UC-1, UC-2, UC-3
2	Introduction to Knowledge Representation	E	6,00		6,00	GPC-3, UC-3
3	Deep Learning (offered in a foreign language)	E	6,00		6,00	GPC-2, UC-3
4	Big Data and Machine Learning in Healthcare (offered in a foreign language)	E	6,00		6,00	GPC-2, GPC-3, PC-10, UC-1, UC-2, UC-3
5	Recommender Systems (offered in a foreign language)	E	6,00		6,00	GPC-2, PC-11, UC-1, UC-3, UC-6
Magolego			9,00	6,00	9,00	
1	All-university Pool MAGOLEGO Courses	E	9,00		9,00	UC-1, UC-3, UC-4
Final State Certification (FSC)			3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6

	Artificial Intelligence and Information Transmission (AIIT) (General track)		114,00	60,00	60,00	
	Key Seminars		15,00	9,00	6,00	
1	Research Seminar "Artificial Intelligence and Information Transmission"	C	9,00	6,00	3,00	PC-1, PC-4, PC-5, PC-6, PC-7, UC-4
2	Mentor's Seminar	C	6,00	3,00	3,00	PC-1, PC-2, PC-4, PC-5, PC-6, PC-7, UC-4
	Internship		15,00	3,00	12,00	
	Project Internship		3,00	3,00		
1	Term Paper	C	3,00	3,00		GPC-2, GPC-3, PC-1, PC-10, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-9, UC-1, UC-2, UC-3, UC-6
	Research Internship		12,00		12,00	
1	Preparation of Graduation Thesis	C	12,00		12,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-4, PC-5, PC-6, PC-7, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	Major		72,00	42,00	30,00	
	Compulsory Disciplines 1 Academic Year		24,00	24,00		
1	Mathematical Foundations of Information Transmission	C	6,00	6,00		GPC-2, UC-1, UC-3
2	Modern Matrix Equations	C	6,00	6,00		GPC-2, GPC-3
3	Convex Optimization and Applications	C	6,00	6,00		GPC-2, GPC-3, PC-10, UC-1, UC-2, UC-3
4	Image Analysis	C	6,00	6,00		GPC-2, GPC-3, UC-1, UC-2, UC-3
	Elective Courses 1st year		18,00	18,00		
1	Discrete Mathematics for Application and Algorithm Development (offered in a foreign language)	E	3,00	3,00		UC-1, UC-2, UC-3
2	Probability Theory and Mathematical Statistics (offered in a foreign language)	E	3,00	3,00		UC-1, UC-2, UC-3
3	Modern Methods of Data Analysis (offered in a foreign language)	E	6,00	6,00		GPC-3, UC-1, UC-2, UC-5
4	Network Science (offered in a foreign language)	E	6,00	6,00		GPC-1, UC-1, UC-2, UC-3
5	Machine Learning and Data Mining (offered in a foreign language)	E	6,00	6,00		GPC-1, UC-1, UC-2
6	Decision Making and Data Analysis under Uncertainty and Ambiguity	E	6,00	6,00		GPC-2, UC-3, UC-4
7	Geospatial Data Science (offered in a foreign language)	E	6,00	6,00		GPC-1, UC-1, UC-2, UC-3
8	Games and Decisions in Data Analysis and Modelling (offered in a foreign language)	E	6,00	6,00		UC-1, UC-2, UC-3
9	Robust Methods in Statistics	E	6,00	6,00		GPC-2, UC-1, UC-3
10	Natural Language Processing on Python (offered in a foreign language)	E	6,00	6,00		GPC-3, PC-10

11	Applied Quantitative Logistics (offered in a foreign language)	E	6,00	6,00		GPC-2, PC-10, UC-1, UC-2, UC-3
12	Computational Linguistics and Text Analysis	E	6,00	6,00		GPC-2, PC-10, UC-1, UC-2, UC-3
13	Machine Learning	E	12,00	12,00		GPC-1, GPC-2, UC-1, UC-2, UC-3
	Compulsory Disciplines 2 course		6,00		6,00	
1	Predictive Modelling	C	6,00		6,00	GPC-2, UC-3
	Elective courses 2 year		24,00		24,00	
1	Big Data and Machine Learning in Healthcare (offered in a foreign language)	E	6,00		6,00	GPC-2, GPC-3, PC-10, UC-1, UC-2, UC-3
2	Recommender Systems (offered in a foreign language)	E	6,00		6,00	GPC-2, PC-11, UC-1, UC-3, UC-6
3	Deep Learning (offered in a foreign language)	E	6,00		6,00	UC-3
4	How to Examine and Predict Time Series: Methods and Applications (offered in a foreign language)	E	6,00		6,00	GPC-2, PC-10, UC-1, UC-2, UC-3
5	Introduction to Knowledge Representation	E	6,00		6,00	GPC-3, UC-3
	Magolego		9,00	6,00	9,00	
1	All-university Pool MAGOLEGO Courses	E	9,00		9,00	UC-1, UC-3, UC-4
	Final State Certification (FSC)		3,00		3,00	
1	Final Qualification Paper	C	3,00		3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-10, PC-11, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	General Components		6,00	6,00		
	Key Seminars					
	Internship					
	Project Internship					
	Professional Internship					
	Research Internship					
	Major					
	Magolego		6,00	6,00		
1	All-university Pool MAGOLEGO Courses	E	6,00	6,00		UC-1, UC-3, UC-4

Curriculum agreed:

Academic Supervisor	KUZNETSOV S.O.	17.05.2022
Dean	ARZHANTSEV I.V.	17.05.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	18.05.2022

* Subject type:

Compulsory course

C

Elective course

E