



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.03.02 Applied Mathematics and Information Science
 Educational Programme "Data Science and Business Analytics"
 Implementing unit: Faculty of Computer Science, HSE - Moscow

APPROVED
 25.08.2022
 Vice Rector
 ROSHCHIN S.Y.
 Signed with EDS

Years of Study: 2022/2023 - 2025/2026

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

Block Code	Course	Subject type	Credits	Credits by Years				Planned Educational Programme Development Results
				1	2	3	4	
	Degree Programme		240,00	60,00	60,00	60,00	60,00	
	Major		166,00	49,00	43,00	31,00	43,00	
	Core Professional Block (Major)		82,00	40,00	31,00	4,00	7,00	
1	Discrete Mathematics 2 (offered in a foreign language)	C	5,00		5,00			GPC-1, GPC-2, GPC-3, PC-1, UC-1
2	Computer Architecture and Operating Systems (offered in a foreign language)	C	5,00		5,00			GPC-1, GPC-2, GPC-3, GPC-4, PC-2, PC-3, UC-1, UC-2
3	Calculus 2 (offered in a foreign language)	C	5,00		5,00			GPC-1, GPC-3, PC-1, UC-1, UC-2
4	Probability Theory and Mathematical Statistics (offered in a foreign language)	C	8,00		8,00			GPC-1, GPC-3, PC-1, UC-1, UC-2, UC-9
5	Algorithms and Data Structures (offered in a foreign language)	C	8,00		8,00			GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1
6	Optimization Methods (offered in a foreign language)	C	4,00			4,00		GPC-2, GPC-3, GPC-4, PC-1, PC-2, UC-1
7	Calculus (offered in a foreign language)	C	10,00	10,00				GPC-1, GPC-3, PC-1, UC-1, UC-2
8	Linear Algebra and Geometry (offered in a foreign language)	C	10,00	10,00				GPC-1, GPC-3, PC-1, UC-1, UC-2
9	Algebra (offered in a foreign language)	C	3,00	3,00				GPC-1, GPC-3, PC-1, UC-1, UC-2
10	Statistical Methods for Market Research (offered in a foreign language)	C	7,00				7,00	GPC-1, PC-1, UC-1, UC-2
11	Introduction to Programming (offered in a foreign language)	C	10,00	10,00				GPC-4, PC-1, PC-3, UC-2, UC-3
12	Discrete Mathematics (offered in a foreign language)	C	7,00	7,00				GPC-1, GPC-3, PC-1, UC-1, UC-2
	Elective Professional Block (Major)		84,00	9,00	12,00	27,00	36,00	
	Elective Courses (Block 1)		4,00			4,00		
1	Financial Economics (offered in a foreign language)	E	4,00			4,00		GPC-1, GPC-3, PC-1, UC-1, UC-9

2	Sociology of Financial Behavior (offered in a foreign language)	E	4,00			4,00		GPC-3, PC-4, PC-5, PC-6, UC-1, UC-10, UC-9
	Elective Courses (Block 2)		4,00			4,00		
1	Data Analysis in Business (offered in a foreign language)	E	4,00			4,00		GPC-2, PC-1, PC-5, UC-1, UC-9
2	Investment Management for Business (offered in a foreign language)	E	4,00			4,00		GPC-4, PC-5, PC-7, UC-1, UC-9
	-		5,00				5,00	
1	Quantitative Finance (offered in a foreign language)	E	5,00				5,00	GPC-1, UC-1, UC-2
2	Systems Analysis (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-3, PC-1, PC-5, UC-1, UC-2, UC-3
	-		7,00				7,00	
1	Asset Pricing and Financial Markets (offered in a foreign language)	E	7,00				7,00	GPC-1, UC-1, UC-2
2	Core Management Concepts (offered in a foreign language)	E	7,00				7,00	GPC-3, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
	-		4,00			4,00		
1	Research Seminar "Data Science in Financial Economics" (offered in a foreign language)	E	4,00			4,00		GPC-1, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, UC-1, UC-3, UC-9
2	Research Seminar "Risk-Management in Banking" (offered in a foreign language)	E	4,00			4,00		GPC-1, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-7, UC-1, UC-2, UC-3, UC-4, UC-9
3	Research Seminar "Data Science in scientific" (offered in a foreign language)	E	4,00			4,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, PC-1, PC-2, PC-4, PC-5, PC-7, UC-1, UC-3, UC-4, UC-6
	-		5,00				5,00	
1	Research Seminar "Mathematical and Computational Engineering in Science and Business 2" (offered in a foreign language)	E	5,00				5,00	GPC-1, PC-1, UC-1, UC-4
2	Research Seminar "Data Analysis in Finance" (offered in a foreign language)	E	5,00				5,00	GPC-1, PC-1, UC-1, UC-4
	Elective Professional Block (Major)		55,00	9,00	12,00	15,00	19,00	
1	Differential Equations (offered in a foreign language)	C	4,00		4,00			GPC-1, GPC-4, PC-1, UC-1
2	Introduction to Micro and Macroeconomics (offered in a foreign language)	C	8,00		8,00			GPC-1, PC-5, UC-1, UC-2, UC-9
3	Time Series Analysis (offered in a foreign language)	C	4,00			4,00		GPC-1, GPC-3, PC-1, UC-1
4	Econometrics (offered in a foreign language)	C	7,00			7,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-9
5	Machine Learning 1 (offered in a foreign language)	C	4,00			4,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, PC-1, PC-2, PC-3, PC-5, UC-1
6	Information Systems (offered in a foreign language)	C	5,00				5,00	GPC-2, GPC-4, PC-3
7	Machine Learning 2 (offered in a foreign language)	C	7,00				7,00	GPC-1, GPC-4, GPC-5, PC-1, PC-2, UC-1

8	Decision Making Strategy (offered in a foreign language)	C	7,00				7,00	GPC-2, PC-1, UC-2, UC-3, UC-4, UC-5, UC-6
9	English Language (offered in a foreign language)	C	9,00	9,00				PC-4, PC-5, UC-3, UC-4, UC-5
	Internship		30,00		8,00	8,00	14,00	
	Professional Internship		6,00		3,00	3,00		
1	Educational Internship (offered in a foreign language)	C	3,00		3,00			PC-1, PC-2, PC-3, PC-4
2	Work Experience Internship (offered in a foreign language)	C	3,00			3,00		PC-1, PC-2, PC-3, PC-4, PC-7, UC-10, UC-11
	Project Internship		10,00		5,00	5,00		
1	Term project 1 (offered in a foreign language)	C	5,00		5,00			GPC-4, PC-2, PC-3, PC-4, PC-5, PC-7, UC-1, UC-2, UC-3, UC-4
2	Term project 2 (offered in a foreign language)	C	5,00			5,00		GPC-2, GPC-3, PC-1, PC-7, UC-4, UC-5
	Research Internship		14,00				14,00	
1	Preparation of Graduation Thesis	C	9,00				9,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-6
2	Graduation Internship (offered in a foreign language)	C	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, UC-2, UC-3, UC-6
	General Courses		15,00	10,00	1,00	4,00		
	Core General Courses		2,00	1,00	1,00			
1	Safe Living Basics (offered in a foreign language)	C	1,00	1,00				UC-10, UC-11, UC-5, UC-6, UC-8
2	Physical Training (offered in a foreign language)	C	1,00		1,00			UC-7
	Optional General Courses		13,00	9,00		4,00		
1	Russian History (offered in a foreign language)	C	4,00			4,00		PC-6, UC-1, UC-5
2	Foundations of Law (offered in a foreign language)	C	4,00	4,00				GPC-2, PC-3, PC-6, UC-1, UC-10, UC-2, UC-3, UC-4
3	Introduction to Economics (offered in a foreign language)	C	5,00	5,00				GPC-2, GPC-3, UC-1, UC-3, UC-4
	Minor		20,00		8,00	12,00		
1	Business and Management in Global Context (offered in a foreign language)	C	8,00		8,00			GPC-3, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6
2	Stochastic processes and applications (offered in a foreign language)	C	4,00			4,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1
3	Deep Learning (offered in a foreign language)	C	4,00			4,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, PC-1, PC-2, PC-3, PC-5, UC-1
4	Business analytics, applied modelling and prediction (offered in a foreign language)	C	4,00			4,00		GPC-4, PC-1, PC-7, UC-1, UC-9
	Data Culture		5,00			5,00		
1	Independent Programming Test. Advanced Level (offered in a foreign language)	C						GPC-2, GPC-4, PC-2, PC-3, UC-1
2	External Examinations on Digital Skills. Entry-level (offered in a foreign language)	C						GPC-4
3	External Examinations on Digital Skills. Intermediate Level (offered in a foreign language)	C						GPC-4

4	Databases (offered in a foreign language)	C	4,00			4,00		GPC-4, PC-3
5	Data Science, AI and Generative Models Independent Test. Advanced Level (offered in a foreign language)	C	1,00			1,00		GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, PC-1, PC-2, PC-3, UC-1
6	External Examinations on Digital Skills. Final Level (offered in a foreign language)	C						GPC-4
7	Independent Digital Literacy Test (offered in a foreign language)	C						GPC-2, PC-3
	Final State Certification (FSC)		3,00				3,00	
	Thesis Work		3,00				3,00	
1	Presenting of Graduation Thesis	C	3,00				3,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8
	State Examinations							
	English		1,00	1,00				
	Examinations		1,00	1,00				
1	Independent English Exam (offered in a foreign language)	C	1,00	1,00				UC-4

Curriculum agreed:

Academic Supervisor	VOZNESENSKAYA T.V.	23.08.2022
Dean	ARZHANTSEV I.V.	24.08.2022
Head of Centre for Educational Model Design	LEPESHKIN I.A.	24.08.2022

* Subject type:

Compulsory course C
Elective course E