



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 09.03.04 Software Engineering,  
38.03.05 Business Informatics

Educational Programme "Разработка информационных систем для бизнеса"

Specializations: "Information Systems Lifecycle Management", "IT Analytics", "Software Systems Development"

Implementing unit: -, HSE - Perm

APPROVED

02.05.2024

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Years of Study: 2024/2025 - 2027/2028

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		161,00	47,00	35,00	39,00	40,00	
	Core Professional Block (Major)		106,00	41,00	32,00	16,00	17,00	
1	Программирование	C	10,00	10,00				GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-2, PC-8, PC-9
2	Algebra	C	7,00	7,00				GPC-1.SEN, UC-1
3	Calculus	C	9,00	9,00				GPC-1.SEN, UC-1
4	Practice in Basics of Technical Documentation Designing	C	3,00	3,00				GPC-4.SEN, GPC-5.BUI, PC-3, PC-4, UC-4
5	Discrete Mathematics	C	8,00	8,00				GPC-1.SEN, UC-1
6	Theoretical Foundations of Computer Science	C	4,00	4,00				GPC-2.SEN, GPC-4.BUI, GPC-7.SEN
7	Probability Theory and Mathematical Statistics	C	4,00		4,00			GPC-1.SEN, UC-1
8	Databases	C	5,00		5,00			GPC-4.BUI, GPC-8.SEN, PC-9
9	Algorithms and Data Structures	C	6,00		6,00			GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-2, PC-8, PC-9
10	Software Design	C	7,00		7,00			GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-2, PC-6, PC-8, PC-9
11	Computer Architecture and Operating Systems	C	4,00		4,00			GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-2, PC-8, PC-9
12	Data Analysis in Python	C	3,00		3,00			GPC-1.SEN, GPC-4.BUI, GPC-6.SEN, GPC-8.SEN, PC-18, PC-9

13	Economics	C	3,00		3,00			GPC-1.BUI, PC-13, UC-9
14	Enterprise Architecture	C	4,00			4,00		GPC-1.BUI, GPC-4.BUI, GPC-7.SEN, PC-14, PC-15, PC-4, PC-6
15	Leadership and Team Management (offered in a foreign language)	C	3,00			3,00		GPC-5.BUI, PC-12, PC-19, PC-2, PC-7, UC-11, UC-3, UC-4
16	Development and Analysis of Requirements	C	5,00			5,00		GPC-2.BUI, GPC-3.BUI, GPC-7.SEN, PC-10, UC-11, UC-3
17	Machine Learning	C	4,00			4,00		GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-17
18	IT Project Management	C	4,00				4,00	GPC-2.BUI, GPC-3.BUI, GPC-5.BUI, GPC-7.SEN, PC-1, PC-10, PC-2, PC-7, UC-2
19	Economics of Software Product Development	C	4,00				4,00	GPC-3.BUI, GPC-4.SEN, GPC-7.SEN, PC-2, PC-7, UC-2, UC-9
20	Software Systems Architecture Design (offered in a foreign language)	C	5,00				5,00	GPC-1.BUI, GPC-3.BUI, GPC-7.SEN, PC-10
21	Artificial Intelligence Systems and Technologies	C	4,00				4,00	GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-10, PC-17, PC-18, PC-9
	Elective Professional Block (Major)		55,00	6,00	3,00	23,00	23,00	
	Seminars and Career Guidance Disciplines		15,00	6,00	3,00	3,00	3,00	
	Compulsory Seminars		12,00	6,00	3,00		3,00	
1	Career Guidance Seminar	C	3,00	3,00				GPC-1.SEN, GPC-3.SEN, GPC-4.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-3, PC-5, UC-1
2	Project Seminar	C	6,00	3,00	3,00			GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-2, UC-3
3	Research Seminar	C	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-7.SEN, UC-1, UC-2, UC-4, UC-6
	Optional Research Seminar		3,00				3,00	
1	Research Seminar "Formal Methods in Software Engineering"	E	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
2	Research Seminar "Introduction to Design Science"	E	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
3	Research Seminar "Basics of Cybersecurity"	E	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
4	Research Seminar "DevOps: Introduction"	E	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
5	Research Seminar "Development of Mobile Applications"	E	3,00				3,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
	Specialization Disciplines		40,00				20,00	20,00

	Courses of Educational Track "Analytics in IT"		40,00		20,00	20,00	
	Compulsory Courses		20,00		10,00	10,00	
1	Qualitative and Quantitative Methods of Elaboration and Adoption of Management Decisions	C	6,00		6,00		GPC-1.BUI, GPC-2.BUI, GPC-4.BUI, PC-1, PC-13
2	Business Process Modelling	C	4,00		4,00		GPC-1.BUI, GPC-4.BUI, PC-15, PC-4, PC-6
3	Entrepreneurship	C	3,00			3,00	PC-13, PC-15
4	Financial and Managerial Accounting	C	3,00			3,00	GPC-1.SEN, GPC-4.SEN, PC-13, UC-9
5	General and Strategic Management	C	4,00			4,00	GPC-2.BUI, PC-1, UC-6
	Systems and Process Analysis		6,00		6,00		
1	Modern Simulation Tools for Processes and Systems Analysis	E	6,00		6,00		GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-17, PC-9
2	Programming Tools of BI	E	6,00		6,00		GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-17, PC-9
3	Integration, Processing and Visualization of Data	E	6,00		6,00		GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-17, PC-9
	Soft Skills Disciplines		4,00		4,00		
1	Communication Management	E	4,00		4,00		GPC-5.BUI, PC-1, PC-19, UC-3
2	Organisational Behaviour and Human Resource Management	E	4,00		4,00		GPC-5.BUI, PC-1, PC-19, UC-3
	Корпоративные информационные системы		6,00			6,00	
1	Enterprise Automation	E	6,00			6,00	GPC-2.BUI, GPC-3.BUI, GPC-5.BUI, PC-14, PC-15, PC-16, PC-3, UC-1, UC-2
2	Large Information Systems Implementation Projects	E	6,00			6,00	GPC-2.BUI, GPC-3.BUI, GPC-5.BUI, PC-14, PC-15, PC-16, PC-3, UC-1, UC-2
3	Development of Web Application Interfaces	E	6,00			6,00	GPC-2.BUI, GPC-3.BUI, GPC-5.BUI, PC-14, PC-15, PC-16, PC-3, UC-1, UC-2
	Advanced Digital Product Management Tools		4,00			4,00	
1	Product Analytics	E	4,00			4,00	GPC-2.BUI, GPC-3.BUI, PC-10, PC-4, PC-8, PC-9
2	Digital business models, platform solutions and e-commerce	E	4,00			4,00	GPC-2.BUI, GPC-3.BUI, PC-10, PC-4, PC-8, PC-9
	Courses of Educational Track "Software Systems Development"		40,00		20,00	20,00	
	Compulsory Courses		5,00		5,00		
1	Software Quality Assurance and Testing	C	5,00		5,00		GPC-2.BUI, GPC-3.BUI, PC-7
	Modern Programming Technologies		5,00		5,00		
1	Web Programming	E	5,00		5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
2	Java Programming	E	5,00		5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
3	Computer Graphics	E	5,00		5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9

4	Functional and Logic Programming	E	5,00			5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
	Organization of Computations		6,00			6,00		
1	Computer Networks	E	6,00			6,00		GPC-2.SEN, GPC-5.SEN, GPC-7.SEN, PC-9
2	Linux Operating System Administration	E	6,00			6,00		GPC-2.SEN, GPC-5.SEN, GPC-7.SEN, PC-9
3	Technologies and Algorithms of High-Performance Computing	E	6,00			6,00		GPC-2.SEN, GPC-6.SEN, GPC-7.SEN, PC-18, PC-7, PC-9
	Programming Methods and Techniques		12,00				12,00	
1	Contemporary Software Systems Development with Python	E	6,00				6,00	GPC-2.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-2, PC-8
2	Model-oriented Information Systems Development	E	6,00				6,00	GPC-1.SEN, GPC-2.SEN, GPC-6.SEN, GPC-8.SEN, PC-10
3	BI Tools for Pcess and Task Management	E	6,00				6,00	GPC-1.SEN, GPC-2.SEN, GPC-8.SEN, PC-10
	Intelligent and Information Systems Methods		8,00				8,00	
1	Semantic Information Systems	E	4,00				4,00	GPC-1.SEN, GPC-2.SEN, GPC-8.SEN, PC-10
2	Data Analysis Technologies in Internet	E	4,00				4,00	GPC-1.SEN, GPC-2.SEN, GPC-8.SEN, PC-10
3	Neuron Networks	E	4,00				4,00	GPC-1.SEN, GPC-2.SEN, GPC-8.SEN, PC-10
	Soft Skills Disciplines		4,00			4,00		
1	Communication Management	E	4,00			4,00		GPC-5.BUI, PC-1, PC-19, UC-3
2	Organisational Behaviour and Human Resource Management	E	4,00			4,00		GPC-5.BUI, PC-1, PC-19, UC-3
	Courses of Educational Track "Information Systems Lifecycle Management"		40,00			20,00	20,00	
	Compulsory Courses		25,00			15,00	10,00	
1	Qualitative and Quantitative Methods of Elaboration and Adoption of Management Decisions	C	6,00			6,00		GPC-1.BUI, GPC-2.BUI, GPC-4.BUI, PC-1, PC-13
2	Business Process Modelling	C	4,00			4,00		GPC-1.BUI, GPC-4.BUI, PC-15, PC-4, PC-6
3	Entrepreneurship	C	3,00				3,00	PC-13, PC-15
4	General and Strategic Management	C	4,00				4,00	GPC-2.BUI, PC-1, UC-6
5	Financial and Managerial Accounting	C	3,00				3,00	GPC-1.BUI, PC-13, UC-9
6	Software Quality Assurance and Testing	C	5,00			5,00		GPC-2.BUI, GPC-3.BUI, GPC-7.SEN, PC-7
	Modern Programming Technologies		5,00			5,00		
1	Web Programming	E	5,00			5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
2	Computer Graphics	E	5,00			5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9

3	Java Programming	E	5,00			5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
4	Functional and Logic Programming	E	5,00			5,00		GPC-2.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-9
	Components of a digital enterprise Development		6,00				6,00	
1	Business-oriented Programming Development and Low-Code Systems	E	6,00				6,00	GPC-4.BUI, PC-14, PC-16, PC-4
2	UI Development	E	6,00				6,00	GPC-4.BUI, PC-15, PC-8
	Digital Enterprise		4,00				4,00	
1	Electronic Business	E	4,00				4,00	GPC-1.BUI, GPC-4.BUI, GPC-7.SEN, PC-1, PC-11, PC-14, PC-15, PC-16, PC-17
2	Internet Entrepreneurship	E	4,00				4,00	GPC-1.BUI, GPC-4.BUI, GPC-7.SEN, PC-1, PC-11, PC-14, PC-15, PC-16, PC-17
	Internship		36,00	3,00	5,00	10,00	18,00	
	Professional Internship		5,00			5,00		
1	Work Experience Internship	C	5,00			5,00		GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-2, PC-5, UC-1, UC-2, UC-4, UC-6
	Project Internship		19,00	3,00	5,00	5,00	6,00	
1	Research or Applied Project	C	3,00	3,00				GPC-1.BUI, GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, UC-3, UC-6
2	Capstone Design Project	C	6,00				6,00	GPC-1.BUI, GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, UC-3, UC-6
3	Term Paper	C	10,00		5,00	5,00		GPC-1.BUI, GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, UC-3, UC-6
	Research Internship		12,00				12,00	
1	Graduation Internship	C	6,00				6,00	GPC-1.SEN, GPC-3.SEN, GPC-5.SEN, GPC-6.BUI, GPC-7.SEN, PC-10, PC-13, PC-14, PC-16, PC-2, PC-5, UC-1, UC-4
2	Preparation of Graduation Thesis	C	6,00				6,00	GPC-1.SEN, GPC-2.SEN, GPC-3.SEN, GPC-4.SEN, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, GPC-8.SEN, PC-10, PC-11, PC-12, PC-13, PC-14, PC-16, PC-17, PC-18, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-4, UC-6, UC-9
	General Courses		11,00	10,00	1,00			
	Core General Courses		2,00	1,00	1,00			
1	Physical Training	C	1,00		1,00			UC-7
2	Safe Living Basics	C	1,00	1,00				UC-8
	Optional General Courses		9,00	9,00				
1	Russian History	C	4,00	4,00				UC-5
2	Foundations of Russian Statehood	C	2,00	2,00				UC-5

3	Legal Literacy	C	3,00	3,00				UC-10, UC-2
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		UC-1, UC-2, UC-5, UC-6
	English		1,00				1,00	
	Examinations		1,00				1,00	
1	Independent English Exam (offered in a foreign language)	C						UC-4
2	Project Proposal (offered in a foreign language)	C	1,00				1,00	PC-5, UC-4
3	English Language Integrative Exam (offered in a foreign language)	C						UC-4
	Optional Courses							
1	English (offered in a foreign language)	O	14,00	8,00	6,00			UC-4
2	Academic English Writing (offered in a foreign language)	O	2,00				2,00	UC-4
	Data Culture		10,00		9,00	1,00		
1	Independent Digital Literacy Test	C						GPC-4.SEN, PC-3, PC-4
2	Independent Programming Test. Advanced Level	C						GPC-1.SEN, GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-18
3	Data Science, AI and Generative Models Independent Test. Advanced Level	C	1,00			1,00		GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-18, PC-9
4	External Examinations on Digital Skills. Entry-level	C						GPC-2.SEN, GPC-4.BUI
5	External Examinations on Digital Skills. Intermediate Level	C						GPC-2.SEN, GPC-4.BUI
6	External Examinations on Digital Skills. Final Level	C						GPC-2.SEN, GPC-4.BUI
7	Mathematical Methods for Data Analysis	C	5,00		5,00			GPC-1.SEN, GPC-4.BUI, GPC-8.SEN, PC-17, PC-9
8	Applied algorithms and data structures	C	4,00		4,00			GPC-2.SEN, GPC-3.BUI, GPC-5.SEN, GPC-6.SEN, GPC-7.SEN, PC-10, PC-18, PC-2, PC-8, PC-9
	Final State Certification (FSC)		1,00				1,00	
	Thesis Work		1,00				1,00	
1	Presenting of Graduation Thesis	C	1,00				1,00	PC-5, UC-4
	State Examinations							

**Curriculum agreed:**

Academic Supervisor LANIN V.V. 20.03.2024

Dean ISOPESKUL O.Y. 21.03.2024

Deputy Director ZAGORODNOVA E.P. 21.03.2024

Head of Centre for  
Educational Model Design

LEPESHKIN I.A.

26.04.2024

\* Subject type:

Compulsory course

C

Elective course

E

Optional course

O