



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 09.03.04 Software Engineering
 Educational Programme "Software Engineering"
 Implementing unit: -, HSE - Perm

APPROVED
 22.04.2021
 Vice Rector
 ROSHCHIN S.Y.
 Signed with EDS

Years of Study: 2021/2022 - 2024/2025

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		149,00	49,00	37,00	24,00	39,00	
	Core Professional Block (Major)		113,00	46,00	34,00	15,00	18,00	
	Subject Areas		113,00	46,00	34,00	15,00	18,00	
	Discrete Mathematics		10,00	10,00				
1	Discrete Mathematics	C	10,00	10,00				GPC-1, UC-1
	Algebra		8,00	8,00				
1	Algebra	C	8,00	8,00				GPC-1, UC-1
	Mathematical Analysis		8,00	8,00				
1	Calculus	C	8,00	8,00				GPC-1, UC-1
	Probability Theory and Mathematical Statistics		5,00		5,00			
1	Probability Theory and Mathematical Statistics	C	5,00		5,00			GPC-1, PC-4, UC-1
	Programming		13,00	13,00				
1	Programming	C	10,00	10,00				GPC-2, GPC-6, GPC-7, PC-10, PC-7, UC-1
2	Computer Practice in Python Programming	C	3,00	3,00				GPC-2, GPC-6, GPC-7, PC-10, PC-7
	Algorithms and Data Structures		8,00		8,00			
1	Algorithms and Data Structures	C	8,00		8,00			GPC-1, GPC-3
	Organization of Computations		13,00		8,00		5,00	
1	Artificial Intelligence Systems	C	5,00				5,00	GPC-1, GPC-2, GPC-8, PC-10
2	Computer System Architecture	C	4,00		4,00			GPC-2, GPC-7
3	Operating Systems	C	4,00		4,00			GPC-2, GPC-7, PC-9
	Software Engineering		8,00		8,00			
1	Software Design (offered in a foreign language)	C	8,00		8,00			GPC-1, GPC-6, GPC-7, GPC-8, PC-10, PC-6, PC-8, PC-9

	Software Architecture		10,00		5,00		5,00	
1	Software Systems Architecture Design (offered in a foreign language)	C	5,00				5,00	GPC-1, GPC-2, GPC-4, GPC-6, GPC-8, PC-10, PC-11, PC-7
2	Databases	C	5,00		5,00			GPC-1, GPC-2, GPC-3, GPC-8, PC-4, PC-6, PC-9
	Software Quality Assurance and Testing		5,00				5,00	
1	Software Quality Assurance and Testing (offered in a foreign language)	C	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-6, PC-11, PC-4, PC-7
	Development and Analysis of Requirements		8,00	3,00			5,00	
1	Development and Analysis of Requirements	C	5,00				5,00	GPC-1, PC-11, PC-3, PC-4, UC-11
2	Practice in Basics of Technical Documentation Designing	C	3,00	3,00				GPC-2, GPC-4, PC-3, PC-5, UC-4
	Software Project Management		17,00	4,00			5,00	8,00
1	Software Project Management	C	4,00				4,00	GPC-2, PC-1, PC-12, PC-2, PC-7, UC-2
2	Software Engineering Economics	C	4,00				4,00	GPC-1, GPC-4, PC-7, UC-2, UC-9
3	Group Dynamics and Communication in Software Engineering Professional Practice	C	5,00				5,00	PC-12, UC-11, UC-3, UC-4, UC-6
4	Introduction into Software Engineering	C	4,00	4,00				GPC-1, GPC-2, GPC-7, PC-12, PC-4, PC-5, UC-1, UC-3
	Elective Professional Block (Major)		36,00	3,00	3,00		9,00	21,00
	Дисциплины по выбору студента (4 курс)		18,00					18,00
	Electives Semester 1		12,00					12,00
1	Data Analysis Technologies in Internet	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-10
2	Linux Operating System Administration	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-9
3	Model-oriented Information Systems Development	E	6,00				6,00	GPC-1, GPC-2, GPC-6, GPC-8, PC-10
4	BI Tools for Poces and Task Management	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-10
5	Technologies and Algorithms of High-Performance Computing	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-10
	Electives Semester 2		6,00					6,00
1	Modern Simulation Tools for Processes and Systems Analysis	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-10
2	Product Analytics	E	6,00				6,00	GPC-1, GPC-2, GPC-8, PC-10
3	Contemporary Software Systems Development with Python	E	6,00				6,00	GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
	Дисциплины по выбору студента (3 курс)		5,00				5,00	
1	Programming in Go	E	5,00				5,00	GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
2	Modern Programming Languages and Technologies	E	5,00				5,00	GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
3	Computer Graphics	E	5,00				5,00	GPC-2, GPC-6, GPC-7, PC-10, PC-7
4	Web Programming	E	5,00				5,00	GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
	Research seminar		7,00				4,00	3,00
	НИС 3 курс		4,00				4,00	

1	Research Seminar "Development of Mobile Applications"	E	4,00			4,00		GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
2	Research Seminar "Introduction to Design Science"	E	4,00			4,00		GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
3	Research Seminar "Programming Tools of BI"	E	4,00			4,00		GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
4	Research Seminar "DevOps: Introduction"	E	4,00			4,00		GPC-2, GPC-5, GPC-6, GPC-7, PC-10, PC-7, PC-8, PC-9
	НИС 4 курс		3,00				3,00	
1	Research Seminar	C	3,00				3,00	GPC-1, GPC-3, GPC-7, PC-5, UC-1, UC-2, UC-4, UC-6
	Проектный семинар		6,00	3,00	3,00			
	Проектный семинар (1 курс)		3,00	3,00				
1	Project Seminar 1	C	3,00	3,00				GPC-1, GPC-2, GPC-4, GPC-5, PC-2, PC-3, PC-5, UC-2, UC-3, UC-6
	Проектный семинар (2 курс)		3,00		3,00			
1	Project Seminar 2	E	3,00		3,00			GPC-1, GPC-2, GPC-4, GPC-5, PC-2, PC-3, PC-5, UC-2, UC-3, UC-6
	Internship		41,00	5,00	8,00	11,00	17,00	
	Professional Internship		9,00		3,00	6,00		
1	Work Experience Internship	C	6,00			6,00		GPC-2, GPC-5, GPC-6, PC-5, UC-6
2	Educational Internship	C	3,00		3,00			GPC-2, GPC-5, GPC-6, PC-5, UC-6
	Project Internship		26,00	5,00	5,00	5,00	11,00	
1	Graduation Internship	E						GPC-2, GPC-5, GPC-6, PC-5, UC-6
2	Командный проект по программной инженерии	C	3,00				3,00	GPC-2, GPC-5, GPC-6, PC-1, PC-10, PC-11, PC-2, PC-3, PC-8, PC-9, UC-3, UC-6
3	Курсовой проект	E	5,00	5,00				GPC-2, GPC-5, GPC-6, PC-10, PC-11, PC-3, PC-5, PC-8, PC-9, UC-3, UC-6
4	Preparation of Graduation Thesis	C	8,00				8,00	GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, PC-1, PC-10, PC-11, PC-12, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, PC-9, UC-1, UC-2, UC-4, UC-6
5	Term Paper	C	10,00		5,00	5,00		GPC-2, GPC-5, GPC-6, PC-10, PC-11, PC-3, PC-5, PC-8, PC-9, UC-6
	Research Internship		6,00				6,00	
1	Graduation Internship	C	6,00				6,00	GPC-2, GPC-5, GPC-6, PC-5, UC-6
	General Courses		14,00	6,00		8,00		
	Core General Courses		2,00	2,00				
1	Physical Training	C	1,00	1,00				UC-7
2	Safe Living Basics	C	1,00	1,00				UC-8
	Optional General Courses		12,00	4,00		8,00		
1	Economics	C	4,00			4,00		UC-2, UC-9
2	Legal Literacy	C	4,00			4,00		UC-10, UC-2

3	History	C	4,00	4,00				UC-5
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		UC-1, UC-2, 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	Academic English Writing (offered in a foreign language)	O	2,00				2,00	UC-4
2	English (offered in a foreign language)	O	8,00	8,00				UC-4
3	English (offered in a foreign language)	O	6,00		6,00			UC-4
	Data Culture		12,00		5,00	7,00		
1	Independent Data Science Test. Advanced Level	C	1,00			1,00		GPC-1, GPC-8, PC-4
2	Independent Digital Literacy Test	C						GPC-2, GPC-3
3	Machine Learning	C	6,00			6,00		GPC-1, GPC-8, PC-4
4	Mathematical Methods for Data Analysis	C	5,00		5,00			GPC-1, GPC-8, PC-4
5	Independent Programming Test. Advanced Level	C						GPC-6, GPC-7, GPC-8
	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, GPC-5, GPC-6, GPC-7, GPC-8, PC-1, PC-10, PC-11, PC-12, 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, UC-7, UC-8
	State Examinations							

Curriculum agreed:

Academic Supervisor	LANIN V.V.	06.04.2021
Dean	ISOPESKUL O.Y.	07.04.2021
Deputy Director	ZAGORODNOVA E.P.	07.04.2021
Head of Centre for Educational Model Design	LEPESHKIN I.A.	20.04.2021

* Subject type:

Compulsory course

C

Elective course

E

Optional course

O