

## National Research University Higher School of Economics (HSE)

## Basic Curriculum

Field of study 09.03.04 Software Engineering  
Educational Programme "Software Engineering"

Faculty of Economics, Management and Business Informatics, HSE - Perm

APPROVED by  
Vice Rector

ROSHCHIN Y.S.  
22.04.2021

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 (competencies according to the educational standard)
				1	2	3	4	
	Degree Programme		240	60	60	60	60	
	Major		149	49	37	25	38	
	Core Professional Block (Major)		108	46	34	14	14	
	Subject Areas		108	46	34	14	14	
	Discrete Mathematics		10	10				
1	Discrete Mathematics	C	10	10				GPC-1, UC-1
	Algebra		8	8				
1	Algebra	C	8	8				GPC-1, UC-1
	Mathematical Analysis		8	8				
1	Calculus	C	8	8				GPC-1, UC-1
	Probability Theory and Mathematical Statistics		5		5			
1	Probability Theory and Mathematical Statistics	C	5		5			GPC-1, PC-4, UC-1
	Programming		13	13				
1	Introduction to Programming	C	10	10				PC-7, GPC-6, GPC-7, GPC-2, PC-10, UC-1
2	Computer Practice in Python Programming	C	3	3				GPC-2, PC-10, GPC-7, GPC-6, PC-7
	Algorithms and Data Structures		8		8			
1	Algorithms and Data Structures	C	8		8			GPC-3, GPC-1
	Organization of Computations		8		8			
1	Operating Systems	C	4		4			GPC-7, GPC-2, PC-9
2	Computer System Architecture	C	4		4			GPC-7, GPC-2
	Software Engineering		8		8			
1	Software Design	C	8		8			GPC-8, PC-9, PC-8, GPC-6, GPC-1, PC-6, GPC-7, PC-10
	Software Architecture		10		5		5	

1	Databases	C	5		5			PC-4, PC-9, GPC-3, PC-6, GPC-8, GPC-1, GPC-2	
2	Software Systems Architecture Design	C	5				5	PC-7, GPC-6, PC-10, GPC-4, GPC-2, GPC-1, PC-11, GPC-8	
	Software Quality Assurance and Testing		5				5		
1	Software Quality Assurance and Testing	C	5				5	GPC-2, GPC-6, PC-7, PC-11, PC-4, GPC-1, GPC-3	
	Development and Analysis of Requirements		8	3			5		
1	Practice in Basics of Technical Documentation Designing	C	3	3				UC-4, GPC-2, PC-3, GPC-4, PC-5	
2	Development and Analysis of Requirements	C	5				5	PC-11, GPC-1, PC-3, PC-4	
	Software Project Management		17	4			4	9	
1	Software Engineering Economics	C	3					3	PC-7, GPC-1, UC-2, GPC-4
2	Software Project Management	C	6					6	PC-12, PC-1, UC-2, PC-7, GPC-2, PC-2
3	Group Dynamics and Communication in Software Engineering Professional Practice	C	4				4		UC-6, UC-3, UC-4, PC-12
4	Introduction into Software Engineering	C	4	4					PC-4, GPC-1, GPC-7, UC-1, UC-3, GPC-2, PC-12, PC-5
	Elective Professional Block (Major)		41	3	3		11	24	
	Дисциплины по выбору студента (4 курс)		21					21	
1	Web Programming	E	7					7	GPC-6, PC-8, GPC-7, GPC-5, PC-9, PC-10, PC-7
2	Intelligent Systems	E	7					7	GPC-1, PC-10, GPC-8, GPC-2
3	Neuron Networks	E	7					7	GPC-2, PC-10, GPC-1, GPC-8
4	Data Analysis Technologies in Internet	E	7					7	GPC-8, GPC-2, GPC-1, PC-10
5	Semantic Information Systems	E	7					7	GPC-1, GPC-2, GPC-8, PC-10
	Дисциплины по выбору студента (3 курс)		8					8	
1	Distributed Computing	C	4				4		PC-10, GPC-5, GPC-7, PC-7, PC-9, GPC-6, PC-8, GPC-2
2	Modern Programming Languages and Technologies	E	4				4		GPC-5, PC-10, PC-7, GPC-2, PC-9, GPC-7, PC-8, GPC-6
3	Computer Graphics	E	4				4		GPC-2, GPC-7, PC-10, GPC-6, PC-7
4	Mobile applications development	E	4				4		GPC-6, GPC-5, PC-7, PC-9, PC-10, PC-8, GPC-2, GPC-7
5	Integration, Processing and Visualization of Data	E	4				4		GPC-8, GPC-1, PC-4
	Research seminar		6				3	3	
	НИС 3 курс		3				3		
1	Research Seminar - 1	E	3				3		GPC-3, UC-4, UC-2, GPC-1, UC-6, UC-1, PC-5, GPC-7
	НИС 4 курс		3					3	
1	Research Seminar - 2	E	3					3	UC-1, PC-5, UC-2, UC-4, GPC-3, GPC-7, UC-6, GPC-1
	Проектный семинар		6	3	3				
	Проектный семинар (1 курс)		3	3					

1	Project Seminar 1	C	3	3				GPC-1, GPC-5, GPC-2, UC-6, GPC-4, UC-2, UC-3, PC-3, PC-2, PC-5
	Проектный семинар (2 курс)		3			3		
1	Project Seminar 2	E	3			3		GPC-2, GPC-4, UC-3, PC-3, GPC-5, UC-2, GPC-1, PC-2, UC-6, PC-5
	Internship		42	5	8	11	18	
	Professional Internship		9			3	6	
1	Work Experience Internship	C	6				6	PC-5, GPC-5, GPC-6, UC-6, GPC-2
2	Educational Internship	C	3			3		GPC-6, UC-6, GPC-5, GPC-2, PC-5
	Project Internship		21	5	5	5	6	
1	Graduation Internship	E						UC-6, GPC-2, GPC-6, GPC-5, PC-5
2	Командный проект по программной инженерии	E	6				6	PC-9, GPC-6, PC-8, GPC-5, PC-2, PC-1, PC-10, GPC-2, UC-3, PC-3, UC-6, PC-11
3	Курсовой проект	E	15	5	5	5		UC-3, PC-9, PC-3, PC-8, GPC-2, PC-10, GPC-5, GPC-6, UC-6, PC-11, PC-5
4	Preparation of Graduation Thesis	E						GPC-7, GPC-1, PC-5, GPC-8, PC-2, GPC-3, UC-1, PC-8, UC-6, GPC-2, GPC-4, PC-11, PC-4, PC-12, PC-9, UC-2, GPC-5, GPC-6, PC-1, PC-10, UC-4, PC-6, PC-3, PC-7
	Research Internship		12				12	
1	Graduation Internship	C	6				6	UC-6, PC-5, GPC-2, GPC-5, GPC-6
2	Preparation of Graduation Thesis	C	6				6	PC-2, PC-5, GPC-8, PC-11, PC-3, PC-10, UC-4, GPC-3, GPC-5, PC-9, PC-8, UC-6, GPC-7, PC-4, GPC-1, GPC-6, GPC-2, UC-1, UC-2, PC-12, PC-7, PC-1, PC-6, GPC-4
	General Courses		14	6			8	
	Core General Courses		2	2				
1	Physical Training	C	1	1				UC-7
2	Safe Living Basics	C	1	1				UC-8
	Optional General Courses		12	4			8	
1	Introduction to Law	C	4				4	UC-2
2	Economics	C	4				4	UC-2
3	History	C	4	4				UC-5
	Minor		20		10	10		
1	Minor	E	20		10	10		UC-1, UC-2, UC-6
	English		1				1	
	Examinations		1				1	
1	Independent English Language Test	C						UC-4
2	Project Proposal	C	1				1	PC-5, UC-4
3	English Language Integrative Exam	C						UC-4
	Optional Courses							
1	Academic English Writing	O	2				2	UC-4

2	English	O	8	8			UC-4
3	English	O	6		6		UC-4
	Data Culture		11		5	6	
1	Mathematical Methods for Data Analysis	C	5		5		PC-4, GPC-8, GPC-1
2	Independent Digital Competence Assessment. Digital Literacy	C					GPC-3, GPC-2
3	Independent Digital Competence Assessment. Programming. Advanced Level	C					GPC-7, GPC-8, GPC-6
4	Independent Digital Competence Assessment. Data Science. Advanced Level	C	1			1	GPC-8, PC-4, GPC-1
5	Machine Learning	C	5			5	PC-4, GPC-8, GPC-1
	Final State Certification (FSC)		3				3
	Thesis Work		3				3
1	Presenting of Graduation Thesis	C	3				3 GPC-2, GPC-5, GPC-7, UC-8, PC-8, PC-7, UC-2, UC-3, PC-11, PC-5, UC-1, PC-9, GPC-4, GPC-6, PC-2, PC-3, GPC-3, PC-1, PC-12, UC-6, UC-7, GPC-8, PC-6, UC-5, PC-4, GPC-1, PC-10, UC-4
	State Examinations						

Academic Supervisor VIKENTEVA O.L. 06.04.2021

Dean ISOPESKUL O.Y. 07.04.2021

Deputy Director ZAGORODNOVA E.P. 07.04.2021

Head of Degree Programmes Development Office MAMONOVA M.A. 20.04.2021

\* Subject type:

Compulsory course C

Elective course E

Optional course O