National Research University Higher School of Economics (HSE)

Curriculum
Field of study 09.03.04 Software Engineering
Educational Programme "Software Engineering"
Specializations: "Industrial Software Engineering", "System Programming", "Tools for Software Analysis and Development"
Implementing unit: Faculty of Computer Science, HSE - Moscow
3 rd, 2022/2023 academic year

Length of Programme: 4 years
Years of Study: 2020/2021 - 2023/2024
Mode of Study: Full Time
Degree: Bachelor's degree

Block Code	Course	Subject type	Department	Credits	Total Academic Hours	Contact Hours	Allocation of Contact Hours				Additional Information
							1	2	3	4	
	Degree Progamme			**60,00**	**684**	**159**	**220**	**244**	**275**	**228**	
	Data Culture			**5,00**							
1	Mathematical Methods for Data Analysis	C	Department of Big Data and Information Retrieval	5,00	190	60	28	32A			Online Course, Foreign language
	Major			**37,00**			**180**	**204**	**234**	**190**	
	Core Professional Block (Major)			**24,00**	**912**	**300**	**56**	**64**	**96**	**84**	
	Subject Areas			**24,00**	**912**	**300**	**56**	**64**	**96**	**84**	
	Algorithms and Data Structures			**5,00**	**190**	**60**	**28**	**32**			
1	Databases	C	Department of Software Engineering	5,00	190	60	28	32A			Online Course
	Software Quality Assurance and Testing			**5,00**	**190**	**60**	**28**	**32**			
1	Software Quality Assurance and Testing	C	Department of Software Engineering	5,00	190	60	28	32A			
	Software Architecture			**5,00**	**190**	**60**			**32**	**28**	
1	Software Systems Architecture Design	C	Department of Software Engineering	5,00	190	60			32	28A	
	Development and Analysis of Requirements			**5,00**	**190**	**60**			**32**	**28**	
1	Development and Analysis of Requirements	C	Department of Software Engineering	5,00	190	60			32	28A	Online Course
	Software Project Management			**4,00**	**152**	**60**			**32**	**28**	
1	Software Engineering Economics	C	Department of Software Engineering	4,00	152	60			32	28A	
	Elective Professional Block (Major)			**94,00**			**124**	**140**	**138**	**106**	
	Electives 3 year			**10,00**	**380**	**210**	**252**	**288**	**320**	**280**	
	Дисциплина по выбору			**5,00**	**190**	**90**	**28**	**32**			
1	IOS Applications Development Basics	E	Department of Software Engineering	5,00	190	60	28	32A			

№	Course		Department								
2	Applied Methods of Linear Algebra	E	Department of Mathematics	5,00	190	60	28	32A			
3	Design and Development of Smart Contracts for Blockchain Platforms	E	Department of Software Engineering	5,00	190	60	28	32A			
4	Game development in Unreal Engine	E	Department of Software Engineering	5,00	190	60	28	32A			
5	Spatial Data Management	E	Department of Software Engineering	5,00	190	60	28	32A			Foreign language
6	Functional and Logic Programming	E	Department of Software Engineering	5,00	190	60	28	32A			Foreign language
7	IoT Ecosystems	E	Department of Software Engineering	5,00	190	60	28	32A			Foreign language
	Дисциплина по выбору			**5,00**	**190**	**120**			**32**	**28**	
1	UX Research for Creating Novel Digital Products	E	Department of Software Engineering	5,00	190	60			32	28A	
2	Introduction to Human-Computer Interaction	E	Department of Software Engineering	5,00	190	60			32	28A	Foreign language
3	Computer Networks	E	Department of Software Engineering	5,00	190	60			32	28A	Foreign language
4	Building Scoring Models Using Machine Learning Methods	E	Department of Software Engineering	5,00	190	60			32	28A	Foreign language
5	Design and Development of Decentralized Applications	E	Department of Software Engineering	5,00	190	60			32	28A	
6	Industrial iOS Development	E	Department of Software Engineering	5,00	190	60			32	28A	
7	Distributed Databases and Data Warehouses	E	Department of Software Engineering	5,00	190	60			32	28A	Foreign language
8	Distributed Computing	E	Department of Software Engineering	5,00	190	60			32	28A	Foreign language
	Дисциплины при выборе специализации "Системное программирование" на базовой кафедре ИСП РАН			**10,00**	**380**	**104**	**84**	**96**	**66**	**66**	
	Courses for Concentration "System Programming" Delivered at Joint Department with ISP RAS 3 year			**10,00**	**380**	**104**	**28**	**32**	**22**	**22**	
1	Program Verification	E	Joint System Programming Department with Institute for System Programming of the Russian Academy of Sciences	5,00	190	60	28	32A			
2	Compiler Technologies	E	Joint System Programming Department with Institute for System Programming of the Russian Academy of Sciences	5,00	190	44			22	22A	
	Courses for Concentration "Tools for Software Analysis and Development"			**10,00**	**380**	**120**	**28**	**32**	**32**	**28**	
	Courses for Concentration "Tools for Software Analysis and Development" 3 year			**10,00**	**380**	**120**	**28**	**32**	**32**	**28**	
1	Code as Data	E	Department of Software Engineering	5,00	190	60			32	28A	
2	Static Code Analysis	E	Department of Software Engineering	5,00	190	60	28	32A			

	Courses for Concentration "Industrial Software Engineering"			**10,00**	**380**	**120**	**84**	**96**	**96**	**84**	
	Courses for Concentration "Industrial Software Engineering" 3 year			**10,00**	**380**	**120**	**28**	**32**	**32**	**28**	
1	Engineering Approach to C/C++ Programming	E	базовая кафедра фирмы 1С	5,00	190	60	28	32A			
2	Modern C++ Standards	E	базовая кафедра фирмы 1С	5,00	190	60			32	28A	
	Research seminar			**3,00**	**114**	**44**	**156**	**156**	**260**		
	Research seminar			**3,00**	**114**	**44**	**12**	**12**	**20**		
1	Research Seminar "Cloud Services of the Mir Payment System. Business Technology Service Design"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
2	Research Seminar "Data analysis using process mining technology"	E	базовая кафедра ГК «Открытие»	3,00	114	44	12	12	20A		
3	Research Seminar "Introduction to Industrial Software Engineering"	E	базовая кафедра фирмы 1С	3,00	114	44	12	12	20A		
4	Research Seminar "Machine Learning for Software Engineering"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
5	Research Seminar "Fuzzy Modeling"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
6	Research Seminar "Cloud Technology"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
7	Research Seminar "Development of Web Applications in JavaScript"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
8	Research Seminar "Development of Cross-Platform Cloud and Mobile Applications"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
9	Research Seminar "System Programming 1"	E	Joint System Programming Department with Institute for System Programming of the Russian Academy of Sciences	3,00	114	44	12	12	20A		
10	Research Seminar "Computer Vision Technologies"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
11	Research Seminar "Data and Knowledge Management"	E	Department of Software Engineering	3,00	114	44	12	12	20A		
	Minor			**10,00**	**380**	**152**	**38**	**38**	**38**	**38**	
1	Minor	E		10,00	380	152	38	38A	38	38A	
	English					**3**			**3**		
	Examinations					**3**			**3**		
1	Independent English Exam	C	School of Foreign Languages			3			3A		Foreign language
	Internship			**8,00**	**304**	**4**	**2**	**2**			
	Project Internship			**5,00**	**190**	**2**		**2**			
1	Term Project	C		5,00	190	2		2	2	2	
	Professional Internship			**3,00**	**114**	**2**	**2**				
1	Work Experience Internship	C		3,00	114						
2	Technological Internship	C				2	2A				

Curriculum agreed:

Academic Supervisor	AVETISYAN A.I.	13.05.2022
Dean	ARZHANTSEV I.V.	13.05.2022
Head of Degree Programmes Development Office	MAMONOVA M.A.	13.05.2022

* Subject type:

Compulsory course	C
Elective course	E
Optional course	O