



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 01.03.02 Applied Mathematics and Information Science  
Educational Programme "Applied Mathematics and Information Science"

Specializations: "Data Analysis and Intelligent Systems", "Decision Choice and Analysis", "Distributed Systems", "Industrial Software Engineering", "Machine Learning and Applications", "Mathematical and Computational Engineering in Science and Business", "Theoretical Computer Science"

Implementing unit: Faculty of Computer Science, HSE - Moscow

Years of Study: 2020/2021 - 2023/2024

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED  
27.04.2021  
Vice Rector  
ROSHCHIN S.Y.  
Signed with EDS

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	23,00	
	Major		165,00	48,00	42,00	38,00		
	Core Professional Block (Major)		84,00	48,00	30,00	6,00		
	Subject Areas		84,00	48,00	30,00	6,00		
	Discrete Mathematics		7,00	7,00				
	Дискретная математика		7,00	7,00				
1	Discrete Mathematics	C	7,00	7,00				GPC-2, GPC-4, PC-1, UC-3, UC-5
2	Discrete Mathematics (Advanced Course)	C	7,00	7,00				GPC-2, GPC-4, PC-1, UC-3, UC-5
	Linear Algebra and Geometry		13,00	13,00				
	Линейная алгебра и геометрия		10,00	10,00				
1	Linear Algebra and Geometry	C	10,00	10,00				GPC-1, GPC-4, PC-1, UC-3, UC-5
2	Linear Algebra and Geometry (Advanced Course)	C	10,00	10,00				GPC-1, GPC-4, PC-1, UC-3, UC-4
	Алгебра		3,00	3,00				
1	Algebra	C	3,00	3,00				GPC-1, GPC-3, UC-1, UC-3
2	Algebra (Advanced Course)	C	3,00	3,00				GPC-1, GPC-3, UC-1, UC-3
	Mathematical Analysis		18,00	10,00	8,00			
	Математический анализ		10,00	10,00				
1	Calculus	C	10,00	10,00				GPC-1, GPC-3, PC-1, UC-1, UC-3
2	Calculus (Advanced Course)	C	10,00	10,00				GPC-1, GPC-3, PC-1, UC-3
	Математический анализ 2		8,00		8,00			
1	Calculus 2	C	8,00		8,00			GPC-1, GPC-4, PC-2, UC-3, UC-5
2	Calculus 2	C	8,00		8,00			GPC-1, GPC-4, PC-2, UC-3, UC-5
	Probability Theory and Mathematical Statistics		9,00		9,00			

1	Probability Theory and Mathematical Statistics	C	9,00		9,00		GPC-1, GPC-4, PC-1, UC-3, UC-5
2	Probability Theory and Mathematical Statistics	C	9,00		9,00		GPC-1, GPC-4, PC-1, UC-3, UC-5
	Programming		9,00	9,00			
	Основы и методология программирования		9,00	9,00			
1	Introduction to Programming	C	9,00	9,00			GPC-4, PC-1, PC-3, UC-3
2	Introduction to Programming	C	9,00	9,00			GPC-3, PC-1, PC-3, UC-3
	Algorithms and Data Structures		13,00	9,00	4,00		
	Алгоритмы и структуры данных		9,00	9,00			
1	Algorithms and Data Structures	C	9,00	9,00			GPC-4, PC-1, PC-2, UC-2, UC-3
2	Algorithms and Data Structures	C	9,00	9,00			GPC-4, PC-1, PC-2, UC-2, UC-3
	Алгоритмы и структуры данных 2		4,00		4,00		
1	Algorithms and Data Structures 2	C	4,00		4,00		GPC-4, PC-1, PC-2, UC-3, UC-5
2	Algorithms and Data Structures 2	C	4,00		4,00		GPC-4, PC-1, PC-2, UC-3, UC-5
	Optimization Methods		6,00			6,00	
1	Optimization Methods	E	6,00			6,00	GPC-1, GPC-2, GPC-3, PC-1, PC-4, UC-1, UC-2
2	Optimization in Machine Learning	E	6,00			6,00	GPC-1, GPC-2, GPC-3, PC-1, PC-4, UC-1, UC-2
	Computer Architecture and Operating Systems		9,00		9,00		
1	Computer Architecture and Operating Systems	C	9,00		9,00		GPC-3, GPC-4, PC-1, UC-1, UC-3
	Elective Professional Block (Major)		81,00		12,00	32,00	
	Обязательная дисциплина по выбору (2 курс 2 семестр)		5,00		5,00		
1	Differential Equations	E	5,00		5,00		GPC-1, GPC-4, PC-1, UC-1, UC-3
2	Fundamentals of Matrix Computations	E	5,00		5,00		GPC-1, GPC-4, PC-1, UC-1, UC-3
	Дисциплины по выбору (Блок 1)		5,00			5,00	
1	Computer Systems Security	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
2	Computer Networks	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	SQL Language	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
4	Statistical Learning Theory (offered in a foreign language)	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
5	Bioinformatics	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
6	Foundations of Tensor Computations	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
7	Decision Making under Risk and Uncertainty	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
8	Applied Statistical Data Analysis	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
9	Distributed Systems	E	5,00			5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2

10	Functional Programming	E	5,00			5,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
11	Data Collection and Labeling for Machine Learning	E	5,00			5,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
12	Number Theory and Cryptography	E	5,00			5,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
13	Data management in intelligent systems (offered in a foreign language)	E	5,00			5,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
14	Mathematical Logic	E	5,00			5,00		GPC-1, GPC-3, PC-1, UC-1, UC-2
15	Developing Microservices with Golang	E	5,00			5,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
	Дисциплины по выбору (Блок 2)		6,00			6,00		
1	Java Programming	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
2	Combinatorial Optimization	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	Chapters in Applied Statistics	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
4	Machine Learning 2	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
5	Product Analytics	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
6	Numerical Methods	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
7	Database Systems	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
8	Time Series Modeling	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
9	Modern Coding Theory	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
10	Topological data analysis	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
11	Data Analysis in Business	E	6,00			6,00		GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
12	Quantitative Finance: Derivatives Pricing, Risk Management and Trading	E	6,00			6,00		GPC-3, PC-1, UC-3, UC-5
	Дисциплины по выбору (Блок 3)		10,00				10,00	
1	Methods and Systems for Processing Big Data	E	5,00				5,00	GPC-1, GPC-4, PC-1, PC-2, PC-3, PC-7, UC-1
2	Computer Systems Security	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	Foundations of Tensor Computations	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
4	Statistical Learning Theory (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2

5	Deep Learning for Sound Processing	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
6	Deep Learning for Natural Language Processing	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
7	Bayesian Methods for Machine Learning	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
8	Systems Design	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
9	Data Collection and Labeling for Machine Learning	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
10	Deep Learning for Graph Data Analysis	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
11	Applied Graph Theory (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
12	Complex Systems Theory	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
13	Decision Making under Risk and Uncertainty	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
14	Management Consulting Ffor Business: Basic Skills, Industry and Functional Expertise	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
15	Systems Reliability Engineering	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
16	Scala Programming Language	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
17	Cooperative and Noncooperative Decision Making (offered in a foreign language)	E	5,00				5,00	GPC-3, UC-1, UC-3, UC-9
18	Operating Systems 2	E	5,00				5,00	GPC-1, GPC-4, PC-3, PC-7, UC-1
19	Types and Programming Languages	E	5,00				5,00	GPC-1, GPC-4, PC-1, PC-2, PC-3, PC-7, UC-1
	Дисциплины по выбору (Блок 4)		8,00				8,00	
1	Introduction to Blockchain	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
2	Reinforcement Learning	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	Generative Models in Machine Learning	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
4	Symbolic Computation	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
5	3D Computer Vision	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
6	Efficient Deep Learning Systems	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
7	Media Data Compression and Distribution	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
8	Theory and Practice of Online Experiments	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2

9	Decentralized Systems	E	4,00			4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
10	Conflict and Cooperation (offered in a foreign language)	E	4,00			4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
11	Self-supervised Learning	E	4,00			4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
12	Industrial Programming in Haskell	E	4,00			4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
13	Information Security	E	4,00			4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
14	Analysis and Visualization of Networks (offered in a foreign language)	E	4,00			4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
15	Advanced Chapters in Decision Theory». (offered in a foreign language)	E	4,00			4,00	GPC-3, UC-1, UC-3, UC-9
16	Design and Engineering of Recommender Systems	E	4,00			4,00	GPC-1, GPC-4, PC-1, PC-3, PC-7, UC-1, UC-3, UC-4
17	Introduction to Data Platforms	E	4,00			4,00	GPC-1, GPC-4, PC-1, PC-3, PC-7, UC-1, UC-3, UC-4
	Специализации		29,00			15,00	14,00
	Специализация "Машинное обучение и приложения"		29,00			15,00	14,00
1	Large-Scale Machine Learning	E	4,00			4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
2	Research Seminar "Machine Learning and Applications 2"	E	5,00			5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
3	Deep Learning 2	E	5,00			5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
4	Machine Learning 2	E	6,00		6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
5	Applied Statistical Data Analysis	E	5,00		5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
6	Research Seminar "Machine Learning and Applications"	E	4,00		4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
	Специализация "Теоретическая информатика"		29,00			15,00	14,00
1	One-Way Functions and Their Applications	E	5,00			5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
2	Research Seminar "Theoretical Informatics 2"	E	5,00			5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
3	Convex Programming and Approximation Algorithms	E	4,00			4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
4	Combinatorial Constructions in Theoretical Computer Science	E	6,00		6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
5	Theory of Computation (offered in a foreign language)	E	5,00		5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
6	Research Seminar "Theoretical Informatics"	E	4,00		4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3

	Специализация "Распределенные системы"		29,00			15,00	14,00	
1	Theory of Fault-Tolerant Distributed Systems	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
2	Cloud Computing	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
3	Research Seminar "Distributed Systems 2"	E	5,00				5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
4	Theory and Practice of Concurrency	E	6,00			6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
5	Distributed Systems	E	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
6	Research Seminar "Distributed Systems"	E	4,00			4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
	Специализация "Анализ данных и интеллектуальные системы"		29,00			15,00	14,00	
1	Automatic Text Processing	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
2	Semantic Technologies (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
3	Research Seminar "Data Analysis and Artificial Intelligence 2" (offered in a foreign language)	E	5,00				5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
4	Core Concepts in Data Analysis	E	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
5	Combinatorics, Graphs and Boolean Logic (offered in a foreign language)	E	6,00			6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
6	Research Seminar "Data Analysis and Artificial Intelligence" (offered in a foreign language)	E	4,00			4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
	Специализация "Анализ и принятие решений"		29,00			15,00	14,00	
1	Systems Analysis (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
2	Research Seminar "Applied Problems of Decision Making 2"	E	5,00				5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
3	Time Series and Stochastic Processes (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-3, PC-7, UC-1, UC-3, UC-4
4	Choice and Decision Theory (offered in a foreign language)	E	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
5	Operations Research and Game Theory (offered in a foreign language)	E	6,00			6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
6	Research Seminar "Applied Problems of Decision Making"	E	4,00			4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
	Специализация "Математическая инженерия в науке и бизнесе"		29,00			15,00	14,00	
1	Stochastic Processes	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2

2	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, PC-4, PC-5, UC-1, UC-2, UC-3
3	Complex Systems Theory	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
4	Research Seminar "Mathematical and Computational Engineering in Science and Business" (offered in a foreign language)	E	4,00			4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
5	Partial Differential Equations	E	6,00			6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
6	Mathematical Modeling	E	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, UC-1, UC-2
	-		29,00			15,00	14,00	
1	Systems Reliability Engineering	E	5,00				5,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
2	Systems Reliability Engineering 2	E	4,00				4,00	GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
3	Project Seminar "Software Engineering 2"	E	5,00				5,00	GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
4	Fault-tolerant System Design	E	5,00			5,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
5	Fault-tolerant System Design 2	E	6,00			6,00		GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, UC-1, UC-2
6	Project Seminar "Software Engineering"	E	4,00			4,00		GPC-1, PC-1, PC-4, PC-5, UC-1, UC-2, UC-3
	Обязательная дисциплина по выбору (2 курс 1 семестр)		4,00		4,00			
1	Mathematical Logic	E	4,00		4,00			GPC-2, GPC-4, PC-1, UC-3, UC-5
2	C++ Programming Language	E	4,00		4,00			GPC-4, PC-1, PC-3, UC-3, UC-5
	Обязательная дисциплина (2 курс)		3,00		3,00			
1	Modern Software Engineering Practices	C	3,00		3,00			GPC-2, PC-1, PC-5, UC-4, UC-5
	Обязательная дисциплина по выбору (4 курс)		5,00				5,00	
1	DevOps (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-4, PC-1, PC-2, PC-3, PC-7, UC-1
2	How to Win a Data Science Competition: Learn from Top Kagglers (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	Introduction to Differential Geometry (offered in a foreign language)	E	5,00				5,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
	Обязательная дисциплина на 3 курсе		6,00			6,00		
1	Machine Learning 1	C	6,00			6,00		GPC-2, GPC-4, PC-1, UC-3, UC-5
	Internship		33,00	3,00	7,00	8,00	15,00	
	Professional Internship		6,00	3,00		3,00		
1	Educational Internship	C	3,00	3,00				PC-1, PC-2, PC-3, PC-4
2	Work Experience Internship	C	2,00			2,00		PC-1, PC-2, PC-3, PC-4, UC-10, UC-11, UC-9

3	Educational Internship	C	1,00			1,00		PC-1, PC-2, PC-3, PC-4
	Project Internship		12,00		7,00	5,00		
1	Программный проект	C	7,00		7,00			GPC-2, PC-1, PC-7, UC-4, UC-5
2	Term Project 2	C	5,00			5,00		GPC-2, PC-1, UC-4, UC-5, UC-6
	Research Internship		15,00				15,00	
1	Preparation of Graduation Thesis	C	9,00				9,00	GPC-1, GPC-2, GPC-4, PC-1, PC-2, PC-4, UC-2, UC-4, UC-5, UC-6, UC-8, UC-9
2	Graduation Internship	C	6,00				6,00	PC-1, PC-2, PC-3, PC-4
	General Courses		14,00	9,00	1,00		4,00	
	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-1, UC-7, UC-8
	Optional General Courses		12,00	8,00			4,00	
1	Psychology	C	4,00				4,00	UC-1, UC-5, UC-8, UC-9
2	Law	C	4,00	4,00				UC-2, UC-3, UC-4
3	Economics	C	4,00	4,00				GPC-3, UC-1, UC-2, UC-3
	Minor		20,00		10,00	10,00		
1	Minor	E	20,00		10,00	10,00		UC-1, UC-2, UC-3, UC-5, UC-6
	English		1,00				1,00	
	Examinations		1,00				1,00	
1	Project Proposal (offered in a foreign language)	C	1,00				1,00	GPC-1, GPC-2, GPC-3, PC-1, PC-4, PC-5, UC-4, UC-5, UC-6
2	English Language Integrative Exam	C						UC-3, UC-4, UC-5
3	Independent English Exam (offered in a foreign language)							UC-3, UC-4, UC-5
	Optional Courses							
1	Academic English Writing (offered in a foreign language)	O	2,00				2,00	UC-3, UC-4, UC-5
2	English (offered in a foreign language)	O	8,00	8,00				UC-3, UC-4, UC-5
3	English (offered in a foreign language)	O	6,00		6,00			GPC-2, PC-1, PC-7, UC-3, UC-4, UC-5
	Data Culture		4,00				4,00	
1	Service-Oriented Architectures (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
2	Introduction to Deep Learning (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
3	Deep Learning 1 (offered in a foreign language)	E	4,00				4,00	GPC-1, GPC-2, GPC-3, PC-1, UC-1, UC-2
	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-7, UC-1, UC-10, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8



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**Curriculum agreed:**

Academic Supervisor	SOKOLOV E.A.	09.04.2021
Dean	ARZHANTSEV I.V.	11.04.2021
Head of Centre for Educational Model Design	LEPESHKIN I.A.	27.04.2021

\* Subject type:

Compulsory course	C
Elective course	E
Optional course	O