



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 09.03.01 Information Science and Computation Technology
Educational Programme "Information Science and Computation Technology"

Specializations: "Automated systems", "Computer Systems and Networks", "Elements and devices of embedded systems"

Implementing unit: Tikhonov Moscow Institute of Electronics and Mathematics, HSE - Moscow

Years of Study: 2020/2021 - 2023/2024

Length of Programme: 4 years

Mode of Study: Full Time

Degree: Bachelor's degree

APPROVED
16.04.2021
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 | 60,00 | |
| | Major | | 166,00 | 52,00 | 43,00 | 35,00 | 36,00 | |
| | Core Professional Block (Major) | | 96,00 | 45,00 | 35,00 | 16,00 | | |
| | Subject Areas | | 96,00 | 45,00 | 35,00 | 16,00 | | |
| | Mathematical Analysis | | 16,00 | 12,00 | 4,00 | | | |
| 1 | Calculus | C | 16,00 | 12,00 | 4,00 | | | GPC-1, GPC-2, UC-1 |
| | Algebra and Geometry | | 5,00 | 5,00 | | | | |
| 1 | Algebra and Geometry | C | 5,00 | 5,00 | | | | GPC-1, UC-1, UC-2 |
| | Discrete Mathematics | | 4,00 | | 4,00 | | | |
| 1 | Discrete Mathematics | C | 4,00 | | 4,00 | | | GPC-1, GPC-2, UC-1 |
| | Probability Theory and Mathematical Statistics | | 4,00 | | 4,00 | | | |
| 1 | Probability Theory and Mathematical Statistics | C | 4,00 | | 4,00 | | | GPC-1, UC-1, UC-2 |
| | Physics | | 16,00 | 12,00 | 4,00 | | | |
| 1 | Physics | C | 16,00 | 12,00 | 4,00 | | | GPC-1, PC-2, PC-3, UC-1 |
| | Electrical Engineering | | 3,00 | | 3,00 | | | |
| 1 | Electrical Engineering | C | 3,00 | | 3,00 | | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Metrology | | 3,00 | | | 3,00 | | |
| 1 | Basics of metrology | C | 3,00 | | | 3,00 | | GPC-1, GPC-3, PC-2, PC-4, UC-1, UC-2 |
| | Theory of Automata and Circuitry | | 8,00 | | 4,00 | 4,00 | | |
| 1 | Automata Theory and Control | C | 4,00 | | 4,00 | | | GPC-1, GPC-2, UC-1, UC-2 |
| 2 | Circuit Engineering | C | 4,00 | | | 4,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Computer Science | | 4,00 | 4,00 | | | | |
| 1 | Computer Science | C | 4,00 | 4,00 | | | | GPC-1, GPC-2, UC-1, UC-2 |
| | Algorithmisation | | 12,00 | 12,00 | | | | |
| 1 | Algorithmization and Programming | C | 12,00 | 12,00 | | | | GPC-1, GPC-2, UC-1, UC-2 |

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|---|--|---|-------|------|------|-------|-------|---|
| | Programming | | 4,00 | | 4,00 | | | |
| 1 | Object-Oriented Programming | C | 4,00 | | 4,00 | | | GPC-1, GPC-2, UC-1, UC-2 |
| | Operating Systems | | 3,00 | | | 3,00 | | |
| 1 | Operating Systems | C | 3,00 | | | 3,00 | | GPC-1, GPC-2, UC-1, UC-2 |
| | Electronics | | 6,00 | | 3,00 | 3,00 | | |
| 1 | Electronics | C | 6,00 | | 3,00 | 3,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Databases | | 5,00 | | 5,00 | | | |
| 1 | Databases | C | 5,00 | | 5,00 | | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Computing Systems and Computer Networks | | 3,00 | | | 3,00 | | |
| 1 | Computer Systems and Computer Networks | C | 3,00 | | | 3,00 | | GPC-1, GPC-2, UC-1, UC-2 |
| | Elective Professional Block (Major) | | 70,00 | 7,00 | 8,00 | 19,00 | 36,00 | |
| | Научно-исследовательский/Проектный семинар | | 25,00 | 7,00 | 8,00 | 6,00 | 4,00 | |
| 1 | Project Seminar "Project Documentation" | C | 4,00 | | | | 4,00 | GPC-2, GPC-3, GPC-4, GPC-6, UC-1, UC-2 |
| 2 | Project Seminar "Fundamentals of Design for Computing Devices and Systems" | C | 3,00 | | 3,00 | | | GPC-2, GPC-3, GPC-4, PC-3, PC-4, UC-1, UC-2 |
| 3 | Project Seminar (1st year) | C | 2,00 | 2,00 | | | | GPC-1, GPC-2, PC-4, UC-1, UC-2 |
| 4 | Project Seminar "Python in Data Science" | C | 5,00 | 5,00 | | | | GPC-1, GPC-2, PC-3, UC-1, UC-2 |
| 5 | Project Seminar "Computer Practice in Mathematics" | C | 5,00 | | 5,00 | | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 6 | Project Seminar "Fundamentals of Production Technology and Machine Learning" | C | 3,00 | | | 3,00 | | GPC-2, GPC-4, PC-5, PC-7, UC-1, UC-3 |
| 7 | Project Seminar "Programming Tools and Technologies" | C | 3,00 | | | 3,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Вариативные дисциплины по выбору ОП | | 12,00 | | | 3,00 | 9,00 | |
| 1 | Mobile Applications Development (offered in a foreign language) | C | 4,00 | | | | 4,00 | GPC-1, GPC-2, UC-1, UC-2 |
| 2 | Information Protection | C | 5,00 | | | | 5,00 | GPC-3, PC-4, UC-1, UC-2 |
| 3 | Automation of Design Works | C | 3,00 | | | 3,00 | | GPC-1, GPC-3, GPC-6, PC-1, PC-3, UC-1, UC-2 |
| | Блоки дисциплин по выбору | | 33,00 | | | 10,00 | 23,00 | |
| | Автоматизированные системы | | 33,00 | | | 10,00 | 23,00 | |
| 1 | System Design of Digital Devices | C | 8,00 | | | | 8,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 2 | Artificial Intelligence Systems | C | 6,00 | | | | 6,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 3 | High-Level Modelling and Simulation of Digital Systems | C | 9,00 | | | | 9,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 4 | Design of the Systems on a Chip | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 5 | Intelligent Data Processing | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Вычислительные системы и компьютерные сети | | 33,00 | | | 10,00 | 23,00 | |
| 1 | Web Application Design | C | 8,00 | | | | 8,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 2 | Multimedia Technologies | C | 9,00 | | | | 9,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 3 | Network Administration Practice | C | 6,00 | | | | 6,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 4 | Computer Network Design | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 5 | Network Video Technologies | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Элементы и устройства встраиваемых систем | | 33,00 | | | 10,00 | 23,00 | |

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| 1 | Digital Signal Processing | C | 8,00 | | | | 8,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 2 | Embedded and Distributed Control Systems | C | 9,00 | | | | 9,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 3 | Standard and Custom Interfaces | C | 6,00 | | | | 6,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 4 | Microcontroller Systems | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 5 | Functional Units of Control Systems and Components | C | 5,00 | | | 5,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Internship | | 33,00 | 3,00 | 6,00 | 8,00 | 16,00 | |
| | Professional Internship | | 9,00 | 3,00 | 3,00 | 3,00 | | |
| 1 | Work Experience Internship | C | 3,00 | | | 3,00 | | GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8 |
| 2 | Computer Graphics | C | 3,00 | | 3,00 | | | GPC-1, GPC-2, UC-1, UC-2 |
| 3 | Computer-based Workshop on Engineering Graphics | C | 3,00 | 3,00 | | | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | Project Internship | | 8,00 | | 3,00 | 5,00 | | |
| 1 | Исследовательский или прикладной проект | E | 8,00 | | 3,00 | 5,00 | | GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8 |
| | Research Internship | | 16,00 | | | | 16,00 | |
| 1 | Graduation Internship | C | 4,00 | | | | 4,00 | GPC-1, GPC-2, GPC-3, GPC-4, GPC-5, GPC-6, GPC-7, GPC-8, GPC-9, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8 |
| 2 | 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, GPC-9, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8 |
| 3 | Qualifying Internship | C | 4,00 | | | | 4,00 | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| 4 | Algorithmization and Programming | C | | | | | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | General Courses | | 14,00 | 5,00 | 1,00 | 4,00 | 4,00 | |
| | Core General Courses | | 2,00 | 1,00 | 1,00 | | | |
| 1 | Safe Living Basics | C | 1,00 | 1,00 | | | | UC-8 |
| 2 | Physical Training | C | 1,00 | | 1,00 | | | UC-7 |
| | Optional General Courses | | 12,00 | 4,00 | | 4,00 | 4,00 | |
| 1 | Economics | C | 4,00 | | | | 4,00 | UC-5, UC-6 |
| 2 | History | C | 4,00 | 4,00 | | | | UC-4, UC-5 |
| 3 | Legal Literacy | C | 4,00 | | | 4,00 | | UC-5 |
| | Minor | | 20,00 | | 10,00 | 10,00 | | |
| 1 | Minor | C | 20,00 | | 10,00 | 10,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2 |
| | English | | 1,00 | | | | 1,00 | |
| | Examinations | | 1,00 | | | | 1,00 | |

