



National Research University Higher School of Economics (HSE)

Curriculum

Field of study 03.03.02 Physics

Educational Programme "Physics"

Specializations: "Quantum Field Theory", "Solid State Physics"

Implementing unit: St. Petersburg School of Mathematics,

Physics and Computer Science, HSE, HSE - Saint Petersburg

4 th, 2024/2025 academic year

APPROVED

20.05.2024

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

Length of Programme: 4 years

Years of Study: 2021/2022 - 2024/2025

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 Programme | | | 60,00 | 2 204 | 198 | 216 | 254 | 236 | 8 | |
| | Major | | | 27,00 | 950 | 146 | 216 | 254 | 192 | | |
| | Core Professional Block (Major) | | | 11,00 | 418 | 146 | 58 | 58 | 30 | | |
| | Subject Areas | | | 11,00 | 418 | 146 | 58 | 58 | 30 | | |
| | Computational Physics | | | 8,00 | 304 | 86 | 28 | 28 | 30 | | |
| 1 | Mathematical modeling in physics | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 30 | | | 30A | | Foreign language |
| 2 | Numerical Methods | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 56 | 28A | 28A | | | |
| | Theoretical Physics | | | 3,00 | 114 | 60 | 30 | 30 | | | |
| 1 | Condensed Condition Physics | C | Department of Physics (at HSE University in St.Petersburg) | 3,00 | 114 | 60 | 30 | 30A | | | Online Course |
| | Elective Professional Block (Major) | | | 16,00 | 532 | | 158 | 196 | 162 | | |
| | - | | | 14,00 | 532 | | 158 | 196 | 162 | | |
| | Дисциплины специализации "Квантовая теория поля" | | | 14,00 | 532 | 160 | 64 | 66 | 30 | | |
| 1 | Gauge Theory | C | Department of Physics (at HSE University in St.Petersburg) | 3,00 | 114 | 40 | 20 | 20A | | | |
| 2 | Quantum field theory 2 | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 30 | | | 30A | | |
| 3 | General Relativity | C | Department of Physics (at HSE University in St.Petersburg) | 3,00 | 114 | 30 | 14 | 16A | | | |

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|--|---|---|--|--------------|--------------|------------|-----------|-----------|-----------|-----------|---|
| 4 | Statistical Physics | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 60 | 30 | 30A | | | |
| Дисциплины специализации "Физика твёрдого тела" | | | | 14,00 | 532 | 166 | 64 | 66 | 36 | | |
| 1 | Quantum optoelectronics | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 40 | 20 | 20A | | | |
| 2 | Statistical Physics | C | Department of Physics (at HSE University in St.Petersburg) | 4,00 | 152 | 60 | 30 | 30A | | | |
| 3 | Physics and technology of semiconductor devices | C | Department of Physics (at HSE University in St.Petersburg) | 3,00 | 114 | 36 | | | | 36A | |
| 4 | Semiconductor Devices Physics | C | Department of Physics (at HSE University in St.Petersburg) | 3,00 | 114 | 30 | 14 | 16A | | | |
| Проектный семинар | | | | 2,00 | | | | | | | |
| 1 | Project seminar on quantum field theory | E | Department of Physics (at HSE University in St.Petersburg) | 2,00 | 76 | 2 | | | | 2A | |
| 2 | Project seminar on solid state physics | E | Department of Physics (at HSE University in St.Petersburg) | 2,00 | 76 | 2 | | | | 2A | |
| English | | | | 1,00 | 38 | 2 | | | | 2 | |
| Optional Courses | | | | | | | | | | | |
| 1 | Academic English Writing | O | | 2,00 | 76 | 54 | 16 | 18 | 20A | | Foreign language, Credits only to the cumulative rating |
| Examinations | | | | 1,00 | 38 | 2 | | | | 2 | |
| 1 | Project Proposal | C | Department of Physics (at HSE University in St.Petersburg) | 1,00 | 38 | 2 | | | | 2A | Foreign language |
| Final State Certification (FSC) | | | | 1,00 | 38 | 2 | | | | 2 | |
| Thesis Work | | | | 1,00 | 38 | 2 | | | | 2 | |
| 1 | Presenting of Graduation Thesis | C | | 1,00 | 38 | 2 | | | | 2A | |
| General Courses | | | | 4,00 | 152 | 38 | | | | 38 | |
| Optional General Courses | | | | 4,00 | 152 | 38 | | | | 38 | |
| 1 | Philosophy | C | Школа философии и культурологии | 4,00 | 152 | 38 | | | | 38A | |
| Internship | | | | 27,00 | 1 026 | 10 | | | | 4 | 6 |
| Research Internship | | | | 15,00 | 570 | 4 | | | | 2 | 2 |
| 1 | Preparation of Graduation Thesis | C | | 15,00 | 570 | 4 | | | | 2 | 2 |
| Project Internship | | | | 1,00 | 38 | 2 | | | | | 2 |
| 1 | Projects | C | | 1,00 | 38 | 2 | | | | | 2A |
| Professional Internship | | | | 11,00 | 418 | 4 | | | | 2 | 2 |
| 1 | Graduation Internship | C | | 11,00 | 418 | 4 | | | | 2 | 2A |

Curriculum agreed:

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|--|-------------------|------------|
| Academic Supervisor | SHENDEROVICH I.E. | 08.05.2024 |
| Dean | | 08.05.2024 |
| Deputy Director | KUZMIN P.V. | 08.05.2024 |
| Head of Centre for Educational Model Design | LEPESHKIN I.A. | 14.05.2024 |

* Subject type:

Compulsory course

C

Elective course

E

Optional course

O