



National Research University Higher School of Economics (HSE)

Basic Curriculum

Field of study 03.04.02 Physics
Educational Programme "Physics"

Trajectories: "Condensed Matter Physics", "Hydrogen Energy", "Low Temperature Physics", "Nanoelectronics and Photonics", "Quantum Optics and Nanophotonics", "Quantum Technologies", "Space Physics", "Theoretical Physics"

Implementing unit: Faculty of Physics, HSE - Moscow

Years of Study: 2022/2023 - 2023/2024

Length of Programme: 2 years

Mode of Study: Full Time

Degree: Master's degree / MBA

APPROVED

27.05.2022

Vice Rector

ROSHCHIN S.Y.

Signed with EDS

| Block Code | Course | Subject type | Credits | Credits by Years | | Planned Educational Programme Development Results |
|------------|---|--------------|---------|------------------|-------|--|
| | | | | 1 | 2 | |
| | Degree Programme | | 120,00 | 60,00 | 60,00 | |
| | Hydrogen Energy (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, PC-8, UC-1, UC-2 |
| 2 | Research Seminar "Modern Technologies for Creating PEMFC and SOFC" | C | 6,00 | 6,00 | | GPC-1, PC-1, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Computer Modeling of Fuel Cells. Digital Doubles of PEMFC and SOFC" | C | 6,00 | 6,00 | | GPC-3, PC-1, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-2, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 2 | Research project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Proton Conductivity of Materials with a Confined State of Water | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |

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|---|--|---|--------|-------|-------|--|
| 3 | Constructional and Functional Ceramics for Solid Oxide Fuel Cells (SOFC) | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Electrochemistry of Proton-exchange Membrane Fuel Cell (PEMFC) and Redox Batteries | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Systems and Methods for Hydrogen Production and Storage | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | PC-1, PC-7, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Nanoelectronics and Photonics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |
| 2 | Research Seminar "Methods for Multielectronic System Simulation" | C | 6,00 | 6,00 | | GPC-4, PC-1, PC-4, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Spin-photonics" | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-1, PC-3, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 2 | Research project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Low-dimensional Electron Systems | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-2, PC-5, UC-1 |
| 3 | Charge Ordering in Condensed Matter | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Introduction to Superconducting Electronics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Applied Photonics and Fiber Optics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | PC-1, PC-7, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |

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|---|---|---|--------|-------|-------|--|
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Low Temperature Physics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |
| 2 | Research Seminar "Low Temperature Physics" | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-1, PC-3, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Condensed Matter Physics" | C | 6,00 | 6,00 | | UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, UC-4, UC-5, UC-6 |
| 2 | Research Project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Ultra-low temperatures and low-dimensional systems | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 3 | Methods of Low-Temperature Physics | C | 12,00 | 12,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Spectroscopy of Solid Media | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 6 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Theoretical Physics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-3, UC-1, UC-2 |
| 2 | Research Seminar "Seminar on scientific literature" | C | 6,00 | 6,00 | | GPC-1, GPC-2, PC-1, PC-2, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Methods of Statistical Physics of Highly Non-Equilibrium Systems" | C | 6,00 | 6,00 | | GPC-2, GPC-3, GPC-4, PC-3, PC-4, PC-7, PC-8, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |

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| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 2 | Research project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Introduction to the Physics of Disordered Systems | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 3 | Quantum Statistical Physics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Quantum Electrodynamics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Quantum Transport | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Space Physics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |
| 2 | Research Seminar "Statistical Analysis of the Space Data" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Experimental Astrophysics" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, UC-4, UC-5, UC-6 |
| 2 | Research Project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Celestial Mechanics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 3 | Observational Cosmology | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |

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| 4 | Plasma Astrophysics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | High-Energy Astrophysics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Quantum Optics and Nanophotonics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |
| 2 | Research Seminar "Quantum Optics" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| 3 | Research Seminar «The Physics of Quantum Information» | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 2 | Research Project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | PC-4, UC-1, UC-2, UC-3 |
| 2 | Fundamentals of Nanophotonics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 3 | Spectroscopy of condensed matter | C | 12,00 | 12,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Laser Spectroscopy | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 6 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | PC-1, PC-7, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Quantum Technologies (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |

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| 2 | Research Seminar "Atomic Scale Technologies on Surfaces" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3 |
| 3 | Research Seminar "Quantum Information" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 2 | Research Project | C | 48,00 | | 48,00 | GPC-1, GPC-3, PC-3, PC-4, PC-5, PC-6, PC-7, UC-4, UC-5, UC-6 |
| 3 | Preparation of the Graduate 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-6, PC-7, PC-8, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Physical Basis for Quantum Information | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 2 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 3 | Computer Simulation of Multiatomic Systems | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Quantum Technologies. Experimental Realizations for Quantum Computations | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Spin Physics | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | GPC-4, PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | PC-1, PC-7, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |
| | Condensed Matter Physics (Research track) | | 120,00 | 60,00 | 60,00 | |
| | Key Seminars | | 21,00 | 18,00 | 3,00 | |
| 1 | Mentor's Seminar | C | 9,00 | 6,00 | 3,00 | GPC-4, PC-2, UC-1, UC-2 |
| 2 | Research Seminar "Spin Physics in Semiconductor Structures" | C | 6,00 | 6,00 | | GPC-1, GPC-2, GPC-3, GPC-4, PC-3, PC-5, PC-6, PC-7, PC-8, UC-1, UC-2, UC-3 |
| 3 | Research Seminar «Structure of Real Crystals» | C | 6,00 | 6,00 | | UC-1, UC-2, UC-3 |
| | Internship | | 57,00 | 6,00 | 51,00 | |
| | Research Internship | | 57,00 | 6,00 | 51,00 | |
| 1 | Project | C | 6,00 | 6,00 | | GPC-1, UC-1, UC-2, UC-3 |
| 2 | Research Project | C | 48,00 | | 48,00 | GPC-1, UC-1, UC-2, UC-3 |

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|---|--|---|-------|-------|------|--|
| 3 | Preparation of the Graduate Thesis | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6 |
| | Major | | 39,00 | 36,00 | 3,00 | |
| 1 | Introduction to Machine Learning | C | 3,00 | | 3,00 | GPC-4, UC-1, UC-2, UC-3 |
| 2 | Equilibrium and Nonequilibrium Condensed Systems | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 3 | Electrons in Disordered Media | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 4 | Technology of nanostructures | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 5 | Optics of Condensed Matter | C | 6,00 | 6,00 | | GPC-1, GPC-4, PC-1, PC-4, PC-5, UC-1 |
| 6 | Astrophysics and Cosmology | C | 6,00 | 6,00 | | PC-2, PC-5, UC-1, UC-2, UC-3 |
| 7 | Stochastic Processes in Physics and Beyond | C | 6,00 | 6,00 | | PC-1, PC-7, UC-1, UC-2, UC-3 |
| | Final State Certification (FSC) | | 3,00 | | 3,00 | |
| 1 | Final Qualification Paper | C | 3,00 | | 3,00 | GPC-1, GPC-2, GPC-3, GPC-4, 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 |

Curriculum agreed:

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|---|----------------|------------|
| Academic Supervisor | LEBEDEV V.V. | 25.05.2022 |
| Dean | TRUNIN M.R. | 25.05.2022 |
| Head of Centre for Educational Model Design | LEPESHKIN I.A. | 26.05.2022 |

* Subject type:

Compulsory course C