

PHYSICS AND TECHNOLOGY OF NANOSTRUCTURES (2024)

120 credits

Professional training

Mandatory courses

- Physical Mechanisms of Functioning of Hybrid Nanostructures
- Mathematic Methods for Physics of Nanostructures
- Physical Mechanisms of Functioning of Hybrid Nanostructures
- Methods and Techniques of Physical Experiment
- Optical Spectroscopy and Luminescence of Polyatomic Systems
- Nanoplasmonics
- Physics of Nanostructures
- Basics of Research Planning and Management of Scientific Research in the Field of Materials Science and Nanotechnology

1, 2, 3, 4 semesters

27 credits

Elective specializations/modules/courses

- Optical Approaches to the Study of Transport Processes at the Microscopic Level
- Linear and Nonlinear Photonics of Extremely Limited Gaseous Media
- Dynamics of Open Quantum Systems
- Optical and Laser Microscopy
- Quantum Chemistry
- Chemical Methods for Nanofabrication
- Nonlinear Optics
- Electron and Probe Microscopy
- Optical Activity of Nanostructures
- Physical Methods in the Diagnosis and Therapy of Diseases

1, 2, 3 semesters

18 credits

45 credits

Fundamental training

- Creative Technologies
- Entrepreneurship
- Thinking
- Foreign Language
- PhD Track
- Applied Artificial Intelligence
- Soft Skills

1, 2, 3, 4 semesters

18 credits

Practical training

- Research Internship
- Pre-graduation Internship
- Preparation for Thesis Defense and Thesis Defense

1, 2, 3, 4 semesters

57 credits

Optional courses (in English)

- Spintronics
- Applied Hybrid Materials
- Modern Methods of Optical Micro- and Spectroscopy
- Quantum Optics
- Electrodynamics of Metamaterials
- Methods of Computer Simulation
- Microfluidics
- Physical Mechanisms of Functioning of Hybrid Nanostructures
- Methods of Computer Simulation
- Emission and Counting of Single Photons
- Nanoplasmonics
- Methods of Machine Learning
- Dynamics of Open Quantum Systems
- Nanoplasmonics
- Special Sections of Organic Chemistry
- Soft Skills Elective micromodules (Mediation and Dispute Resolution, Art & Math of Decision Making, Stress Management, Reputation Management, Empathy and Non-Violent Communication, Pitches and Speeches, Evidence-Based Approach to Career Management, Launching and Relaunching your Career, etc.)

1, 2, 3, 4 semesters