

PHYSICS AND TECHNOLOGY OF NANOSTRUCTURES

120 credits

Professional Competencies

Compulsory disciplines (in English)

- 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 semester

27 credits

Elective specializations / modules / disciplines (in English)

- 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 semester

18 credits

45 credits

Core disciplines

- Thinking
- Entrepreneurship
- Creative technologies
- Foreign languages
- Applied Artificial Intelligence
- Soft skills
- PhD Track

1, 2, 3 semester

15 credits

Practical training

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

1, 2, 3, 4 semester

54 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 micro-modules (Stress management, Mediation and dispute resolution, Empathy and non-violent communication, etc.)

1, 2, 3, 4 semester