

**Institute of Physics**  
**Department of Physics**  
**Master degree program**  
**Condensed Matter Physics**

Studying within the framework of the magistracy "Condensed state physics" provides an opportunity for students to undergo in-depth studying, both in the experimental plan and in relation to the development of modern theoretical concepts in the physics of condensed matter. Experienced students acquire master's degree by performing laboratory works on real research installations, as well as listening and mastering the material of special courses on modern experimental methods, primarily spectroscopic.

### **Academic staff**

Most of the professors involved in the program have scientific degrees of Doctor of Science and Ph D. Most of them have been working in the leading Universities of Japan, France, German, Holland, Finland and UK for a long time.

### **Career opportunities**

The sphere of professional activity of graduates are leading research centers, design agencies and high-tech industries, universities and institutions of the system of higher and secondary education, IT companies and research and production centers that develop and study new promising materials, new devices including quantum and nanoscale devices.

Scientific direction: physics.

### **The learning outcomes of Master`s program are:**

- 1) Ability of students to work independently in various fields of Quantum electronics, magnetic radiospectroscopy, solid state physics, synthesis and research of new materials.
- 2) Students` active participating in research projects. By the end of the Master`s program graduates are able to design and perform PhD research projects.

### **General courses**

- Philosophical issues of natural science
- Special physical workshop
- Computer technologies in science and education
- Foreign language in professional communication
- Group theory and its applications
- Nanophysics. Basics
- Theory of supersymmetry / Management of research projects
- Computational methods and modeling / Nonlinear dynamical systems, chaos and fractals
- Modern methods of microscopy and spectroscopy of solids / Contemporary abstract mathematics and its applications in natural sciences
- Numerical Methods / Theory of non-crystalline environment / Quantum Computers

### **Special courses**

- History and methodology of physics
- The theory of collective excitations in condensed environment
- High-energy physics and cosmology
- Modern methods of synthesis and investigation of nanostructures
- Gauge fields / Spectroscopy methods of condensed environments

- Mechanisms of magnetic relaxation / Nanomaterials / Theoretical Foundations of spintronics
- Cooperative and coherent phenomena / Causal thermodynamics and statistics / Statistical physics of macromolecules, polymers and complex systems
- Structural and dynamical properties of condensed environments / Representation theory of Lie groups and algebra with applications / Operations research and decision theory
- Laser spectroscopy / Electron paramagnetic resonance spectra
- Recent research trends / High electron paramagnetic resonance / Electron-nuclear double resonance in nanostructures
- Applied nonlinear optics
- Automation of modern physics experiment

## Requirements

Those graduates already holding a Bachelor's degree can apply for admission to Master's degree programs.

1. Applicants must have a qualification/degree corresponding to a 4-year educational program of higher education.
2. If English is not the student's native language, then his/her TOEFL examination results (or equivalent) will be no less than 80 for an on-line test, or no less than 5,5 for IELTS. Training within the Program will be given in English and Russian.
3. Interview

**Credit hours:** 120ECTS(including elective - 124)

**Assessment methodologies used:** please contact the head of the programme for this information

**Duration of the program:** 2 years

**Deadlines for admission:**three months before program start date

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