# FACULTY OF MATHEMATICS AND NATURAL SCIENCES

Courses from the Bachelor's degree programmes:
- MATERIALS PHYSICS AND NANOTECHNOLOGIES
- APPLIED PHYSICS
- APPLIED MATHEMATICS

Courses from the Master's degree programmes:
- APPLIED PHYSICS
- MEDICAL PHYSICS
- MATERIALS SCIENCE
- APPLIED MATHEMATICS
- BUSINESS BIG DATA ANALYTICS

## MODULES IN ENGLISH FROM APPLIED PHYSICS, MATERIALS PHYSICS AND NANOTECHNOLOGIES & MATERIALS SCIENCE STUDY PROGRAMMES

| Core modules | | | | |
|---|---|---|---|---|
| **Course code** | **Course title** | **ECTS/Credits** | **Semester** | **Study cycle** |
| **Bachelor's level courses** | | | | |
| P000B011 | Introduction to specialty | 6 | autumn | bachelor |
| P190B101 | Physics 1 | 6 | **spring** | bachelor |
| P230B202 | Physics 2 | 6 | autumn | bachelor |
| **Generic modules** | | | | |
| P260B001 | Physics of Materials | 6 | **spring** | bachelor |
| P190B001 | Thermodynamics and Statistical Physics | 6 | **spring** | bachelor |
| P190B302 | Quantum Mechanics | 6 | autumn | bachelor |
| P200B103 | Optics | 3 | **spring** | bachelor |
| P250B301 | Solid State Physics | 6 | **spring** | bachelor |

| Specific module from Materials and nanotechnologies & Material science study programmes | | | | |
|---|---|---|---|---|
| **Course code** | **Course title** | **ECTS/Credits** | **Semester** | **Study cycle** |
| **Bachelor's level courses** | | | | |
| P190B101 | Physics 1 | 6 | **spring** | bachelor |
| P230B202 | Physics 2 | 6 | autumn | bachelor |
| T150B116 | Polymer Materials and Technologies | 6 | **spring** | bachelor |
| T155B145 | Magnetic Materials and Spintronics | 6 | autumn | bachelor |
| T150B021 | Nanostructures and Nanomaterials | 6 | autumn | bachelor |
| T150B186 | Functional Materials and Nanotechnologies | 6 | autumn | bachelor |
| T150B210 | Phenomena of Modern Optics and Nanophotonics | 6 | autumn | bachelor |
| T000B235 | Final Degree Project | 6 | autumn | bachelor |
| **Master's level courses** | | | | |
| P002M101 | Functional Materials – Exquisite Chapters | 6 | autumn | master |
| P260M104 | Plasma Technologies and Analysis Methods | 6 | autumn | master |
| T150M145 | Project of Plasma Technologies and Analysis Methods | 6 | autumn | master |
| T155M111 | Surface Engineering and Nanotechnology | 6 | autumn | master |
| P200M001 | Applied Optics and Photonics | 6 | **spring** | master |
| T155M010 | Computational Materials Science | 6 | **spring** | master |
| **Specific module from Applied physics study programmes** | | | | |
| **Course title** | **Course title** | **ECTS/Credit** | **Semester** | **Course cycle** |
| **Bachelor's level courses** | | | | |
| P190B005 | Classical Mechanics | 6 | autumn | bachelor |
| P200B403 | Electrodynamics | 6 | autumn | bachelor |
| P190B302 | Quantum Mechanics | 6 | autumn | bachelor |
| P220B305 | Nuclear and Particle Physics | 6 | **spring** | bachelor |
| P240B001 | Vacuum Physics and Technics | 3 | autumn | bachelor |
| P520B001 | Astrophysics | 3 | autumn | bachelor |
| P260B103 | Physics of Surface Phenomena | 6 | autumn | bachelor |
| T150B221 | Micro- and Nanotechnology: Applications and Analysis Methods | 9 | **spring** | bachelor |
| T155B145 | Magnetic Materials and Spintronics | 6 | autumn | bachelor |
| **Master's level courses** | | | | |
| P260M101 | Nanotechnologies in Power Engineering of Alternative Fuel | 6 | autumn | master |
| P230M001 | Physical Technologies | 6 | **spring** | master |
| P190M010 | Dynamics of Nonlinear Nanosystems | 6 | autumn | master |
| P000M005 | Research Project 1 | 6 | autumn | master |
| P000M006 | Research Project 2 | 6 | **spring** | master |
| P000M007 | Research Project 3 | 6 | autumn | master |
| P260M002 | Surface Analysis Methods | 6 | autumn | master |
| P180M001 | Physical Principles of Sensors | 6 | **spring** | master |
| T155M010 | Computational Materials Science | 6 | **spring** | master |
| P220M001 | Influence of Radiation on Material | 6 | autumn | master |
| P260M103 | Physics of Thin Films and Nanotechnology | 6 | autumn | master |

## MODULES IN ENGLISH FROM APPLIED MATHEMATICS & BUSINESS BIG DATA ANALYTICS STUDY PROGRAMMES

| Core modules for technical study programmes students | | | | |
|---|---|---|---|---|
| **Course code** | **Course title** | **ECTS Credits** | **Semester** | **Study** |
| **Bachelor's level courses** | | | | |
| P130B001 | Mathematics 1 | 6 | autumn | bachelor |
| P130B002 | Mathematics 2 | 6 | **spring** | bachelor |
| P160B003 | Theory of Probability and Statistics | 6 | autumn/**spring** | bachelor |
| **Core modules for social study programmes students** | | | | |
| P130B005 | Mathematics 1 | 6 | autumn | bachelor |
| P130B011 | Mathematics 2 | 6 | **spring** | bachelor |
| P160B110 | Statistics | 6 | **spring** | bachelor |
| **Specific modules from Applied mathematics study programme** | | | | |
| P130B003 | Differential Equations | 6 | **spring** | bachelor |
| P160B116 | Optimization Methods | 6 | **spring** | bachelor |
| P160B117 | Stochastic Processes | 6 | autumn | bachelor |
| **Master's level courses** | | | | |
| P130M100 | Nonlinear Dynamical Models | 6 | autumn | master |
| P160M123 | Stochastic Programing | 6 | **spring** | master |
| **Specific Module from Business big data analytics study programme** | | | | |
| P160M126 | Business Risk and Uncertainty Analytics | 6 | autumn | master |

## MODULES IN ENGLISH FROM MEDICAL PHYSICS STUDY PROGRAMME

| **Course code** | **Course title** | **ECTS/Credits** | **Semester** | **Study cycle** |
|---|---|---|---|---|
| **Master's level courses** | | | | |
| B140M104 | Medical Radiation Physics | 6 | autumn | master |
| B140M006 | Radiation Protection and Safety | 6 | autumn | master |
| B145M002 | Radiobiology and Mathematical Modelling | 6 | autumn | master |
| B470M001 | Fundamentals of Human Anatomy and Physiology | 6 | autumn | master |
| B000M001 | Research Project 1 | 6 | autumn | master |
| B140M102 | Ionizing Radiation Imaging Instruments and Methods in Medicine | 6 | autumn | master |
| B110M002 | Digital Processing of Biomedical Signals | 6 | **spring** | master |
| T160M004 | Radiation Detectors and Measurements | 6 | **spring** | master |
| B000M002 | Research Project 2 | 6 | **spring** | master |
| B145M010 | Applied Radionuclide Physics | 3 | autumn | master |
| B140M003 | Diagnostic Radiation Physics | 6 | **spring** | master |
| B140M004 | Radiation Therapy Physics | 9 | autumn | master |
| B140M105 | Radiation pollution | 6 | autumn | master |
| B000M003 | Final degree project 3 | 6 | autumn | master |