

Doctoral program in Physics (N 002)

|   |                         |                              |
|---|-------------------------|------------------------------|
| <b>FACULTY / CENTER</b>   | <b>SCIENTIFIC FIELD</b> | <b>SCIENTIFIC FIELD code</b> |
| VU Faculty of Physics<br>Center for Physical Sciences and Technology (FTMC) | Physics                 | N 002                        |

| <b>Scientific field</b> | <b>Course unit title</b>   | <b>ECTS credits</b> | <b>Faculty, Institute / FTMC</b>   |
|-------------------------|--|---------------------|--|
|                         | <b>Mandatory courses:</b>  |                     |  |
| Physics                 | Galactic astronomy   | 10                  | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy                                  |
| Physics                 | Solid State Physics  | 10                  | FTMC   |
| Physics                 | Selected Topics of Condensed Matter Physics  | 10                  | VU Faculty of Physics<br>Institute of Photonics and Nanotechnology                                       |
| Physics                 | Modern optics and spectroscopy   | 10                  | VU Faculty of Physics<br>Laser Research Center<br>VU Faculty of Physics<br>Institute of Chemical Physics |
| Physics                 | Optical spectroscopy   | 10                  | FTMC   |
| Physics                 | Selected Topics in Theoretical Physics   | 10                  | VU Faculty of Physics<br>Institute of Chemical Physics   |
|                         | <b>Optional courses:</b>   |                     |  |
| Physics                 | Analytical calculations using computer algebra systems                                       | 8                   | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy                                  |
| Physics                 | Environmental Physics and Chemistry  | 8                   | FTMC   |
| Physics                 | Astrospectroscopy  | 8                   | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy                                  |
| Physics                 | Thermodynamics of Open Systems   | 8                   | FTMC   |
| Physics                 | Electronic processes in organic solids   | 8                   | VU Faculty of Physics<br>Institute of Photonics and Nanotechnology                                       |
| Physics                 | Phase transitions in solid state   | 8                   | VU Faculty of Physics<br>Institute of Applied Electrodynamics and Telecommunications                     |
| Physics                 | Optics of femtosecond pulses   | 8                   | VU Faculty of Physics<br>Laser Research Center   |
| Physics                 | Mathematical modelling of physical processes (C & C++) and object-oriented programming (C++) | 8                   | FTMC   |

|         |   |   |   |
|---------|---|---|---|
| Physics | Physics of galaxies   | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Classical and quantum integrable models   | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Quantum Field Theory  | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Quantum Optics  | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Quantum Semiconductor Structures  | 8 | FTMC  |
| Physics | Interaction of laser radiation with matter  | 8 | VU Faculty of Physics<br>Laser Research Center                          |
| Physics | Materials for Ultraviolet Photonics   | 8 | VU Faculty of Physics<br>Institute of Photonics and Nanotechnology      |
| Physics | Molecular and molecular compounds theory  | 8 | VU Faculty of Physics<br>Institute of Chemical Physics                  |
| Physics | Nonlinear dynamics, bifurcation theory and chaos                                  | 8 | FTMC  |
| Physics | Optical, electrical and structural characterization of widebandgap semiconductors | 8 | VU Faculty of Physics<br>Institute of Photonics and Nanotechnology      |
| Physics | Semiconductor photonics   | 8 | VU Faculty of Physics<br>Institute of Photonics and Nanotechnology      |
| Physics | Radioecology  | 8 | FTMC  |
| Physics | Selected mathematical methods and numerical modelling                             | 8 | FTMC  |
| Physics | Subatomic Physics   | 8 | FTMC  |
| Physics | Theoretical atomic spectroscopy   | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Image and data analysis   | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |
| Physics | Stellar physics and evolution   | 8 | VU Faculty of Physics<br>Institute of Theoretical Physics and Astronomy |

Certified by the Doctoral Committee of Physics (N 002) on 02/02/2022, protocol No. (7.17 E)  
15600-KT-32