

Subject matter of classes carried on in English (in alphabetical order):

| | Subject - PHYSICS | Contents | ECTS points |
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| 1. | Advanced course on the condensed matter physics | | 5 |
| 2. | Architecture of databases | <ul style="list-style-type: none"> • <i>Column oriented versus document oriented databases</i> • <i>Catalogues and their structure, LDAP</i> | 4 |
| 3. | Astronomy with Elements of Astrophysics | <ul style="list-style-type: none"> • <i>Spherical Astronomy,</i> • <i>Earth and Solar System,</i> • <i>Celestial Mechanics (Orbits and Kepler 's Laws),</i> • <i>Stellar Parallax,</i> • <i>Blackbody Radiation,</i> • <i>Magnitude Scale,</i> • <i>Optical Telescopes, Radio Telescopes,</i> • <i>Sun as a Star Example,</i> • <i>Solar Interior, Atmosphere and Solar Cycle,</i> • <i>Process of Star Formation,</i> • <i>H-R Diagram, Main Sequence, Stellar evolution,</i> • <i>Spectra and Stellar Classification,</i> • <i>Stars and Stellar Systems,</i> • <i>White Dwarfs, Super Novae, Neutron Stars, Black Holes,</i> • <i>Variable Stars, Eclipsing Binaries, Pulsating Stars,</i> • <i>Milky Way Galaxy, Nature of Galaxies,</i> • <i>Stellar Distances, How Far are Galaxies, Hubble Sequence,</i> • <i>Structure of the Universe</i> | 5 |
| 4. | Basic course on the condensed matter physics | | 4 |
| 5. | Basic courses of Physics | <ul style="list-style-type: none"> • <i>general physics,</i> • <i>classical mechanics,</i> • <i>quantum mechanics,</i> • <i>electromagnetism.</i> | 4 |
| 6. | Basic Ideas of data collecting, storage and treatment | | 4 |
| 7. | Basics of e-learning methods | <ul style="list-style-type: none"> • <i>Information concerning creation</i> | 4 |

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| | | <i>process and usage of Electronics Learning Courses utilizing various accessible authoring tools</i> | |
| 8. | Common RDMS | <ul style="list-style-type: none"> • <i>MS-Access</i> • <i>MySQL, PostgreSQL</i> • <i>MS-SQL Server</i> | 4 |
| 9. | Computer Science | <ul style="list-style-type: none"> • <i>offices, MS word, excel, access ...</i> | 4 |
| 10. | Course on numerical methods applied particularly in the physics research and advanced data evaluation | | 4 |
| 11. | Electronic structure | | 4 |
| 12. | Electrostatics and Magnetism | | 4 |
| 13. | Entity-relationship model | <ul style="list-style-type: none"> • <i>Entities and relationships</i> • <i>Principal key and foreign keys</i> • <i>Chen's notation for entity-relationship modelling</i> • <i>ER diagramming tools</i> • <i>Anomalies in database</i> • <i>Introduction to the predicate and sets algebra</i> • <i>Normal Forms of Database, normalization</i> * <i>Boyce-Codd normal form (BCNF)</i> * <i>4th and 5th normal form</i> | 4 |
| 14. | Fundamentals of physics | <ul style="list-style-type: none"> • <i>basic physics courses providing a thorough introduction to the principles and methods of physics for students who have school preparation in sciences.</i> • <i>Emphasis is placed on problem solving and quantitative reasoning.</i> • <i>This courses cover Newtonian mechanics, thermodynamics, oscillations, waves, electricity and magnetism etc.</i> | 4 |
| 15. | General course on nuclear physics | | 5 |
| 16. | General courses of physics at the undergraduate level including classical mechanics, electrodynamics and statistical physics | | 5 |
| 17. | General educational use of ICT | <ul style="list-style-type: none"> • <i>specially in physics teaching: modelling, simulations, animations, interactive modules etc.</i> | 5 |
| 18. | History of Physics | | 4 |
| 19. | History of Science | | 4 |
| 20. | Introduction to Atomic Physics | | 4 |

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| 21. | Introduction to classical string theory | | 4 |
| 22. | Introduction to modern physics | | 4 |
| 23. | Introduction to Quantum Mechanics | | 4 |
| 24. | Introduction to Solid State Physics | <ul style="list-style-type: none"> • <i>Crystal structure and properties,</i> • <i>Electronic properties,</i> • <i>Thermal, electrical, magnetic, dielectric and optical properties of Solid,</i> • <i>Applications of piezoelectric materials, superconductors, ferroelectrics and related materials.</i> | 4 |
| 25. | Laboratory of Physics – I | <ul style="list-style-type: none"> • <i>Mechanics and Oscillations,</i> • <i>Thermodynamics,</i> • <i>Light,</i> • <i>Electricity and magnetism</i> | 5 |
| 26. | Laboratory of Physics – II | | 5 |
| 27. | Laboratory of Physics – III (modern physics) | | 5 |
| 28. | Material Science | | 6 |
| 29. | Mechanics | | 5 |
| 30. | Methodology of Physics and Science | | 5 |
| 31. | Modelling of data | <ul style="list-style-type: none"> • <i>Hierarchical model</i> • <i>Entity-relationship model</i> • <i>Object-relational model</i> • <i>Object oriented model</i> | 5 |
| 32. | Monographic lectures | | 4 |
| 33. | Nanoscience and nanotechnology | | 4 |
| 34. | Observational Astrophysics | <ul style="list-style-type: none"> • <i>Instrumentation (Large Telescopes, PMT, CCD, Spectrographs),</i> • <i>Observing the Sky, Instrument Calibration,</i> • <i>Preliminary Data Reduction, Bias, Dark, Flat,</i> • <i>Astronomical Photometry, CCD vs. PMT,</i> • <i>Data Reduction, Aperture and PSF photometry,</i> • <i>Stellar Colors, Color Index,</i> • <i>Photometric System,</i> • <i>Light Curve Analysis,</i> • <i>Period Analysis, Fourier Transform, O-C Diagrams,</i> • <i>Interstellar Reddening,</i> • <i>Mass-luminosity relation,</i> | 4 |

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| 35. | Optics and waves | | 4 |
| 36. | Physics education problems | <ul style="list-style-type: none"> • <i>methods currently used to teach physics at schools,</i> • <i>educational use of computers, school physics lab exercises, demonstrations etc.</i> | 4 |
| 37. | Properties of Materials | | 4 |
| 38. | Quantum Mechanics | | 5 |
| 39. | Relational database | <ul style="list-style-type: none"> • <i>Relational Database Management System</i> • <i>Twelve Codd's rules</i> • <i>Relations and attributes versus tables and columns</i> * <i>Relationships in RDMS</i> * <i>Indices and keys</i> * <i>Constrains</i> • <i>Relational operations and operators</i> • <i>Queries</i> • <i>Structured Query Language</i> * <i>DDL, DML, DCL in the SQL</i> * <i>Administration and security</i> • <i>Access to databases</i> * <i>Forms and reports</i> * <i>Client-server model</i> * <i>Transactions</i> * <i>Embedding of SQL language in high level languages</i> * <i>Post and Get methods in HTML, PHP</i> | 4 |
| 40. | Science and religion | | 4 |
| 41. | Seminar for B.Sc. and M.Sc. students | | 4 |
| 42. | Solid State Physics | | 4 |
| 43. | Specialized courses at the advanced level, i.e., M.Sc. and Ph.D. levels | <p><i>The latter courses could be delivered on various aspects of the nuclear microscopic methods oriented toward condensed phase research. In particular they could cover Mossbauer spectroscopy, various applications of the synchrotron radiation, perturbed angular correlations and neutron scattering. Choice of the particular topic has to be established on the individual basis with the group involved as well as the level of the course.</i></p> | 5 |
| 44. | Surface Physics, Thin films | | 4 |
| 45. | Theoretical mechanics | | 5 |
| 46. | Thermodynamics | | 6 |

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| 47. | X-Ray diffraction, Crystallography | 4 |
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