2nd Semester Courses

		Weekly Teaching Hours			
Code	**Course Name**	**T**	**A**	**C**	**ECTS**
FIZ500	Master Thesis	0	0	0	30
FIZ502	**Seminar	0	0	0	7,5
FIZ504	*Advanced Electromagnetic Theory I	3	0	3	7,5
FIZ506	Advanced Physics of Atoms and Molecules I	3	0	3	7,5
FIZ508	Advanced Nuclear Physics I	3	0	3	7,5
FIZ510	Physics of Semiconductors	3	0	3	7,5
FIZ512	Principles of Lasers	3	0	3	7,5
FIZ514	Particle Physics I	3	0	3	7,5
FIZ516	Group Theory for Physicists I	3	0	3	7,5
FIZ518	Introduction to Glass Science and Technology	3	0	3	7,5
FIZ520	Advanced Astrophysics I	3	0	3	7,5
FIZ522	Spectroscopic Methods In Physics	3	0	3	7,5
FIZ524	Molecular Modeling	3	0	3	7,5

*Compulsory courses (minimum 9 credits must be taken)
** A seminar is taken during Master studies.

2nd Semester Courses

		Weekly Teaching Hours			
Code	**Course Name**	**T**	**A**	**C**	**ECTS**
FIZ500	Master Thesis	0	0	0	30
FIZ502	**Seminar	0	0	0	7,5
	Students are given a specific subject related to their research areas.				
FIZ504	*Advanced Electromagnetic Theory I	3	0	3	7,5
	Maxwell Equations, Boundary value problems, Electrostatics, Boundary value problems in Electrostatics. Multipoles, Electrostatics of macroscopic matter, Dielectrics.				
FIZ506	Advanced Physics of Atoms and Molecules I	3	0	3	7,5
	Electron, Photon and Atoms, Fundamental of quantum mechanics. Atoms with one electron and Schrodinger equation, Fine structure, Hyperfine structure and interaction with external fields.				
FIZ508	Advanced Nuclear Physics I	3	0	3	7,5
	Microscopic models for low, intermediate and high energy nuclear systems by taking the quark-gluon and nucleon-meson freedom degrees as basis; nuclear structure, nuclear reactions, strong reactions, GCD, few-body and many-body quantum models, electroweak interactions and beta decays, relativistic models, nuclear symmetry, interacting-boson models, heavy-ion models and applications,				
FIZ510	Physics of Semiconductors	3	0	3	7,5
	Band structures. Impurity states. Statistic of semiconductors. Electrical conductivity. Cyclotron resonance and Hall effect. High electric field and hot electrons. Gunn effect. Optic properties. Absorption processes. Luminescence. Diffusion. p-n junction. Junction transistor. Tunnel diode. Gunn diode. Semiconductor laser. Integrated circuits and microelectronics.				
FIZ512	Principles of Lasers	3	0	3	7,5
	Monochromaticity and cavity stability, Coherence, Directionality, Time dependence of laser output, Amplificatores, Different Lasers.				

FIZ514	Particle Physics I	3	0	3	7,5
	Properties and Phenomenology of elementary particles. Quark-parton models, Quantum Chromodynamics. Electroweak theory.				
FIZ516	Group Theory for Physicists I	3	0	3	7,5
	Group theories used in physical applicatios, Representation, definitions and contents of finite and continuous groups :Lie groups and Lie algebra. Examples: SU(2), SL(2,C), SU(3). Applications chosen related to high energy, solid state, nuclear, and atomic physics.				
FIZ518	Introduction to Glass Science and Technology	3	0	3	7,5
	Definition of Glass, Enthalpy-Temperature Diagram, Principles of glass formation, Glass melting, Phase separation, Structure of glasses, Viscosity, Density and thermal expansion, Transport properties, Mechanical properties, Optic properties, Glass technology.				
FIZ520	Advanced Astrophysics I	3	0	3	7,5
	Black body radiation, Stars and their motions, Coordinate systems, Observational devices, Structure and flavors of stars, The colors of stars, Observation of the stars, Changing stars and flavors, Star Groups and Clusters, Radiation power of stars, Mass and Diameter of stars, Rotation and magnetic fields in stars, Atmospheres and spectra of stars, Dust and gas in the interstellar medium, Effects of interstellar medium on the observations, Thermal and hydrostatic equilibrium in stars, Structure equations of stars, Energy production in stars and energy transport.				
FIZ522	Spectroscopic Methods In Physics	3	0	3	7,5
	X-Ray, Photoelectron spectroscopy, X-Ray Absorption Spectroscopy, Mossbauer Spectroscopy, Raman, IR Spectroscopies, Nuclear Magnetic Resonance Spectroscopy.				
FIZ524	Molecular Modeling	3	0	3	7,5
	Basic concepts of Molecular modeling, Molecular modeling methods, Hartree-Fock Theory, Basic sets, Geometry optimization, Density function theory, Electron correlation methods. QM/MM mixed Models.				
