2nd and 4th Semester Courses

		Weekly Teaching Hours			
Code	**Code Name**	**T**	**A**	**C**	**ECTS**
FIZ600	Ph.D. Thesis	0	0	0	30
FIZ602	**Seminar I	0	0	0	15
FIZ604	**Seminar II	0	0	0	15
FIZ606	*Advanced Electromagnetic Theory II	3	0	3	7,5
FIZ608	Advanced Physics of Atoms and Molecules II	3	0	3	7,5
FIZ610	Advanced Nuclear Physics II	3	0	3	7,5
FIZ612	The Band Theory of Solids	3	0	3	7,5
FIZ614	X-rays and Their Applications	3	0	3	7,5
FIZ616	Particle Physics II	3	0	3	7,5
FIZ618	Group Theory for Physicists II	3	0	3	7,5
FIZ620	Semiconductor Devices	3	0	3	7,5
FIZ622	Advanced Astrophysics II	3	0	3	7,5
FIZ624	Semiconductor Surface Physics	3	0	3	7,5
FIZ626	Data Analysis in the High Energy Physics	3	0	3	7,5

*Compulsory courses (minimum 9 credits must be taken)
** Two seminars are taken during Ph.D. studies.

2nd and 4th Semester Courses

		Weekly Teaching Hours			
Code	**Code Name**	**T**	**A**	**C**	**ECTS**
FIZ600	Tez	0	0	0	30
FIZ602	**Seminer II	0	0	0	15
FIZ604	**Seminer II	0	0	0	15
FIZ606	*Advanced Electromagnetic theory	3	0	3	7,5
	Magnetostatics, Time-Varying Fields, Maxwell equations, Conservation Laws, Wave Guides and Resonant Cavities, Simple Radiating Systems, Scattering and Diffraction, Special relativity theory				
FIZ608	Advanced Physics of Atoms and Molecules II	3	0	3	7,5
	Multi-Electron Atoms, Terms, Selection rules for the electric dipole transition, X-ray spectrums, Addition of the angular momentums. Molecules, Molecular energy, Hartree-Fock Method.				
FIZ610	Advanced Nuclear Physics II	3	0	3	7,5
	Classical collision and scattering problems, Quantum scattering theory. Elastic and inelastic scattering, α, β and γ decays, fission and fusion reactions, reactors and nuclear energy				
FIZ612	The Band Theory of Solids	3	0	3	7,5
	Approximate free electron model, Bloch Functions, electron wave equations in periodic potentials, band structure in the semiconductor, experimental methods for Fermi surface studies.				
FIZ614	X-rays and Their Applications	3	0	3	7,5
	Properties of X rays, Geometry of Crystals, directions and intensity of X-Ray diffraction peaks, experimental methods, diffractometer and spectrometer measurements, crystal structure determination, chemical analysis with the X-Ray Diffraction				
FIZ616	Particle Physics II	3	0	3	7,5
	Local Gauge invariance, symmetry breaking, Higgs mechanism, Salam-Weinberg model, Grand unified theory, accelerators and accelerator experiments, definition of particles, research on Higgs boson, LHC physics, CP violation, neutrino oscillation				
FIZ618	Group Theory for Physicists II	3	0	3	7,5

	Intensive study of those aspects of group theory which are of greatest importance in physical applications. Definitions and introductory concepts, representations, finite groups, continuous groups: lie groups and Lie algebras. Examples: SU (2), SL (2,C), SU (3). Lie algebras and root spaces, Cartan's classifications, Dynkin diagrams, real forms, contractions and expansions. Selected applications to high-energy, nuclear, solid-state, molecular and atomic physics.				
FIZ620	Semiconductor Devices	3	0	3	7,5
	Technologic Tendency in semiconductors, transport mechanism in semiconductors, Mobility and factors affecting mobility, Semiconductor diodes and capacitors, Current mechanism in semiconductors.				
FIZ622	Advanced Astrophysics II	3	0	3	7,5
	Observable entries of astrophysics, atomic and molecular spectra, absorptions and emissions events in the star atmospheres, star opacity, internal structure of stars, equilibrium and thermodynamics of gas structure, star structure equations, state equations, energy production in the center of star, thermonuclear reactions.				
FIZ624	Semiconductor Surface Physics	3	0	3	7,5
	Crystalline structure, clean surface preparation, surface structure, interaction of surface with gases, technics of surface study, electronic surface structure, chemical bonds.				
FIZ626	Data Analysis in the High Energy Physics	3	0	3	7,5
	Root Programing, Linux operating system, Data analysis, Montecarlo and Simulation studies				