DEPARTMENT OF PHYSICS
Content of Master's Degree in Physics with Thesis

COURSE CODE	COURSE NAME AND CONTENTS	T	A	C	ECTS
FIZ701	**Methods Of Mathematical Physics I**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the concepts of series and complex algebra and apply them to various problems. Infinite series, Complex variables and functions, Complex integrals, Sturm-Liouville theory, Calculus of Variation				
FIZ702	**Methods of Mathematical Physics II**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the mathematical concepts of physics with a comprehensive theoretical arguments and emphasize the relation between pure mathematical formalism and results of the theory. Special Functions of Mathematical Physics, Calculus of Variations, Laplace Transformations, Partial Differential Equations, Basic Linear Integral Equations, Group Theory Elements				
FIZ703	**Electromagnetic Theory I**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the fundamentals of electrostatics, special techniques of solving electrostatic problems, electrostatics in matter and basics of magnetostatics. Introduction to Electrostatics, Bound Value Problems in Electrostatics, Multipoles, Electrostatics of Macroscopic Media, Dielectrics, Magnetostatics				
FIZ704	**Electromagnetic Theory II**	**3**	**0**	**3**	**8**
Purpose and Content	To teach fundamental principles of electrodynamics and various applications Plane waves in nonconducting mediums, polarization, reflection and refraction in electromagnetic waves, Kramer-Kronig relations, Cylindirical cavities and wave guides, scattering and diffraction, Relativistic Electromagnetism				
FIZ709	**Theory Of Solid State I**	**3**	**0**	**3**	**8**
Purpose and Content	To gain knowledge about electron dynamics and related subjects, in view of classical theory of solids, which enable students to pursue research in solid state physics. Crystal symmetry,electron levels,conduction properties, electron dynamics, energy bands, optical properties.				
FIZ710	**Theory Of Solid State II**	**3**	**0**	**3**	**8**
Purpose and Content	To gain knowledge about lattice dynamics and related subjects, in view of quantum theory of solids, which enable students to pursue research in solid state physics. Phonons, electron-phonon interactions, interatomic forces and atomic properties, principles of many body techniques, semiconductor crystals, magnetic properties.				

FIZ713	**Classical Mechanics I**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the subjects given in the course content Fundamental concepts of classical mechanics and conservation laws, variational principle and Lagrange equations, two-body central force problem, kinematics of rigid body motion, Euler angles, equation of motion of rigid body.				
FIZ714	**Classical Mechanics II**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the subjects given in the course content Small oscillations, eigenvalue equation, free vibration frequencies and normal coordinates, free vibration of a linear molecule, damping oscillations, special relativity, Hamilton equation of motion, conservation laws and physical meaning of Hamilton, principle of least action, canonical transformations, Poisson's brackets, Hamilton-Jacobi theory and its applications.				
FIZ717	**Nuclear Physics I**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of this course is to provide the student with a clear and logical presentation of the basic concepts and principles of nuclear physics and to strengthen an understanding of the concepts and the principles through a broad range of interesting applications to the real world. Basic properties of nuclei and units Nuclear properties, The force between nucleons, Properties of the nuclear force, The nuclear shell model, Radioactive decay, Alpha, Beta and Gamma decays.				
FIZ718	**Nuclear Physics II**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the nuclear reactions, the neutron detectors, nuclear fission and nuclear fusion. Nuclear reactions, Reaction cross section, The optical model, Neutron physics, Neutron Reactions and Cross Sections, Nuclear fission, Nuclear fusion, Accelerators, Linear accelerators, Nuclear and spin moments.				
FIZ719	**Thin Film Devices**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the basic concepts of amorphous semiconductors and their applications in thin film devices. Basic concepts, production techniques of amorphous semiconductors; The electronic density of states in amorphous semiconductors; Doping in amorphous semiconductors; Fourier transform infrared spectroscopy; Raman spectroscopy; Ultraviolet-visible transmittance spectroscopy; Thin film transistor; Thin film light emitting p-i-n diode; Thin film solar cell.				

FIZ720	**Solid-Liquid Interfaces**	**3**	**0**	**3**	**8**
Purpose and Content	To teach the interactions of surface and interfaces, to give information about measurement methods of surface tensions, to teach measurement methods of contact angle of liquid drop on solids and wetting properties. Definition of a surface and an interface, Experimental determination of surface tension at pure liquid and solution surfaces/interfaces, Solid surfaces, Contact angle of liquid drop on solids, Dynamic contact angle measurement methods, Temperature dependence of contact angle, surface tension surface free energy and surface stress of solids, Adsorption in solid-liquid interfaces, Wetting properties of solid- liquid interfaces.				
FIZ721	**Quantum Mechanics**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of this course is to provide the student with a clear and logical presentation of the basic concepts and principles of quantum mechanics and to strengthen an understanding of the concepts and the principles through a broad range of interesting applications to the real world. The basic concepts of quantum mechanics, Energy and momentum, Schrödinger s equation, Angular momentum,Motion in a centrally symmetric field, Perturbation theory,The quasi-classical case				
FIZ723	**Plasma Physics and Applications**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of the course is to teach graduate students comprehensively what plasma means. Later, the training techniques and application areas of the plasma will be given to the students. Plasma is the 4th state of matter and is known as ionized gas. 99 percent of the universe is plasma. The definition of plasma will be made in the course of high energy and plasma physics. Later, production techniques and application areas will be explained comprehensively.				
FIZ797	**MSc Seminar**	**0**	**2**	**0**	**6**
Purpose and Content	To give the ability of the oral presentation and discussion. To decide on the objectives of the thesis work and the strategy. Presentation of the thesis work				
FIZ7098D	**Course Field of Specialization**	**4**	**0**	**0**	**4**
Purpose and Content	The aim of this course is to give students who are at the course stage the ability to follow, evaluate and discuss the literature on the subject. In addition, the development of students' knowledge and skills in terms of scientific ethics and scientific research methodology. Gathering information on current professional issues Literature research Science ethics Scientific research methodology				

FIZ7098T	**Thesis Field of Specialization**	**4**	**0**	**0**	**4**
Purpose and Content	The aim of this course is to provide students who are at the thesis stage with the ability to follow, evaluate and discuss the literature on the subject they will study. In addition, it is the development of students' knowledge and skills in terms of science ethics and scientific research methodology. Gathering information on current professional issues Literature research Science ethics Scientific research methodology				
FIZ799	**MSc Thesis Research**	**0**	**1**	**0**	**26**
Purpose and Content	To improve the ability of getting the scientific information, its evaluation and interpretation by conductive scientific research. M.S. thesis work				