



DPG DEGREE COLLEGE
(Affiliated to MDU Rohtak)

Sector-34, Near Marble Market, Gurugram 122001

B.Sc.: Physics

B.Sc. Program outcomes listed as follows:

1. Understanding of basic concepts, fundamental principles related to various scientific phenomena and their relevance in day to day life.
2. Development of Research Aptitude.
3. Development of Scientific Temper.
4. Critical thinking and creative ability.

COURSE OBJECTIVES & COURSE OUTCOMES

S. No.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	PHYSICS : B.Sc. 1st SEMESTER	
	Paper: Mechanics	
	<p>The students will be introduced about the forces, angular momentum and about the Constraint.</p> <p>The course will give knowledge about the general parameter like velocity, acceleration.</p> <p>The course will provide the knowledge of Moment of Inertia.</p> <p>The course will provide the students knowledge of hollow cylinder and solid cylinder.</p>	<p>After the completion of the course, students will be able to</p> <p>Understand the motion of objects</p> <p>Understand laws of motion and its applications</p> <p>Understand the idea of conservation of angular momentum, central forces</p> <p>Understand the dynamics of rotating objects i.e. rigid bodies, angular velocity, the moment of inertia, parallel axis theorem, the inertia tensor, the motion of rigid bodies. Non-inertial frames: pseudo forces, examples involving the centrifugal force and coriolis force.</p>
	Paper: Electricity and Magnetism	
	<p>To understand the study of Electric field, Magnetic field, and Electromagnetic theory.</p> <p>The first unit gives the information of mathematical idea behind the electrostatic field.</p> <p>The second unit deals with the physics behind the Magneto statistics.</p> <p>To introduce the electromagnetic theory to students and the use of Maxwell's Equations.</p>	<p>After the completion of the course, Students will be able to</p> <p>Understand the basic concepts of electric and magnetic fields.</p> <p>Gain knowledge on electromagnetic induction and its applications</p> <p>Gain knowledge on EM waves, propagation and their properties.</p> <p>Understand fundamental interactions of electricity and magnetism, both as separate phenomena and as a singular electromagnetic force.</p> <p>The course contains vector analysis, electrostatics, magnetism, electromagnetic induction and Maxwell's equations. The course is very useful for the students in almost every branch of science and engineering.</p>

S.No	COURSE OBJECTIVES	COURSE OUTCOMES
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2.	PHYSICS: B.Sc. III SEMESTER	
	Paper: Optics-I	
	<p>To understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.</p> <p>To know about the effect of translation and refraction. Moreover, chromatic and spherical aberration and distortions are dealt which helps them to understand about the lenses as well as the defects which can occur.</p> <p>To understand the division of wave front in interference. Further Fresnel's Biprism and its application to determine the wavelength of sodium light is dealt which helps the student to find the thickness of very thin objects like Mica practically.</p>	<p>After the completion of the course, Students will be able to</p> <p>Understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.</p> <p>Understand phenomenon based on light and related theories</p> <p>Get skills to identify and apply formulas of optics and wave physics</p> <p>Understand the event like reflection, refraction, interference, diffraction etc.</p>
	Paper: Computer programming, Thermodynamics	
	<p>To understand the basics of FORTRAN programming along with the algorithms used to build the program.</p> <p>To get to know about the basic laws of Thermodynamics, their corollaries, and comprehension of how they can be applied to explain specific natural phenomena.</p> <p>To understand the working of Carnot Engine and various causes of pollutions which internal combustion engine causes.</p> <p>Furthermore, to get the knowledge of various thermodynamic functions which will help them to build the concept of thermodynamics stronger.</p>	<p>After the completion of the course, Students will be able to</p> <p>Understand the basics of FORTRAN programming along with the algorithms used to build the program</p> <p>Use thermodynamic terminology correctly.</p> <p>Explain fundamental thermodynamic properties.</p> <p>Derive and discuss the first and second laws of thermodynamics.</p> <p>Solve problems using the properties and relationships of thermodynamic fluids.</p> <p>Analyze basic thermodynamic cycles.</p> <p>To understanding of thermodynamic fundamentals before studying their application in applied thermodynamics.</p> <p>To understanding of thermodynamic properties and processes will assist students in other related coursework.</p>

1.	PHYSICS: B.Sc. IV SEMESTER	
	Paper: Statistical Mechanics	

	<p>To introduce the concept of Probability, distribution of molecule in two boxes, state thermodynamics probability and phase space.</p> <p>To acquaint the students with the application of probability.</p> <p>To let the students, know about the Boltzman's Distribution law, Bose Einstein statistics and different methods of solving same related problem.</p> <p>To derive the expression for FD statistics, MB Statistics and also specific heat of metals and its solution.</p>	<p>After the completion of the course, students will be able to</p> <p>Apply the thermodynamics probability to find the energy density of the molecular system.</p> <p>Find the relation between microstate and microstate for thermodynamical relation.</p> <p>Use FD, MB statistics for different particles and molecules of systems.</p> <p>Apply FD statistics for derive expression for specific heat of metals.</p> <p>Understand the concept of thermodynamical probabilistic behavior of gaseous, and liquid state.</p>
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Paper: Optics – II

	<p>To Study the interference by division of amplitude and also Newton's Ring interference.</p> <p>To find the applications of Interference phenomenon for calculation of related parameter.</p> <p>Understanding and derivation of Fresnel Diffraction</p> <p>To introduce the Fraunhofer diffraction for more than one slits.</p> <p>To get the formula for resolving power of telescope and grating.</p> <p>To introduce the concept and applications of polarization and to define the Nicol Prism and its applications.</p>	<p>After the completion of the course, Students will be able to</p> <p>Explain the term of interference and elaborate the Newtons Ring methods.</p> <p>Determine the interference parameters with the help of different Interference methods.</p> <p>Construct the diagram and arrangement for Fresnel Diffraction patterns.</p> <p>Apply the knowledge of diffraction phenomenon to find the formula for the N-Slit diffraction patters.</p> <p>Classify the type of Diffraction, Interference and polarizations.</p> <p>Effectively suggest the utilization of optical phenomenon in daily life.</p>
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S.No.	COURSE OBJECTIVES	COURSE OUTCOMES
2.	PHYSICS: B.Sc. V SEMESTER	
	Paper: SOLID STATE PHYSICS	
	<p>To understand the basics of Crystalline and glassy forms, liquid crystals. Crystal structure, periodicity, lattice and basis, crystal translational vectors and axes.</p> <p>To know about the effect of Interplanar spacing, Crystal structures of Zinc sulphide, Sodium Chloride and diamond,.</p> <p>To understand Specific heat of solids, Einstein's theory of specific heat, Debye model of specific heat of solids..</p>	<p>After the completion of the course, Students will be able to</p> <p>Understand the basics of Crystalline and glassy forms, liquid crystals.</p> <p>Understand phenomenon based on light and related theories</p> <p>Get skills to Crystal structures of Zinc sulphide, Sodium Chloride and diamond,.</p> <p>Understand the event like , Debye model of specific heat of solids.</p>
	Paper: QUANTUM MECHANICS	

	<p>To understand the basics of de-Broglie hypothesis. Davisson and Germer experiment. G.P. Thomson experiment. Phase velocity group velocity.</p> <p>To get to know about the basic laws of Gamma Ray Microscope, Electron diffraction from a slit</p> <p>To understand the Normalization of wave function, concept of observable and operator.</p> <p>Furthermore, to get the knowledge of Application of Schrodinger equation in the solution of the following one-dimensional problems : Free particle in one dimensional box.</p>	<p>After the completion of the course, Students will be able to-</p> <p>Understand the basics of de-Broglie hypothesis. Davisson and Germer experiment. G.P. Thomson experiment. Phase velocity group velocity.</p> <p>Use thermodynamic terminology correctly.</p> <p>Explain understand the Normalization of wave function, concept of observable and operator. the knowledge of Application of Schrodinger equation in the solution of the following one-dimensional problems : Free particle in one dimensional box.</p>
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1.	PHYSICS: B.Sc. VI SEMESTER	
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	Paper: ATOMIC, MOLECULAR AND LASER PHYSICS	
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	<p>To introduce the concept of Vector atom model, quantum numbers associated with vector atom model, penetrating and non-penetrating orbits (qualitative description), To acquaint the students with the Zeeman effect (normal and Anomalous) Zeeman pattern of D 1 and D2 lines of Na-atom, Paschen .</p> <p>To let the students, know about the Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence,</p> <p>To derive the expression for Threshold condition for laser emission</p>	<p>After the completion of the course, students will be able to</p> <p>introduce the concept of Vector atom model, quantum numbers associated with vector atom model, penetrating and non- penetrating orbits (qualitative description),</p> <p>TO know about the Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence,</p>
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	Paper: NUCLEAR PHYSICS	
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	<p>To Study the Nuclear mass and binding energy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept), To find the applications of Energetics of alpha -decay, Range and straggling of alpha particles. Geiger-Nuttal law. Introduction of light charged particle (Beta-particle). Understanding and derivation of Interaction of Gamma Ray, Nature of gamma rays, Energetics of gamma rays</p> <p>To get the formula for Nuclear reactions, Elastic scattering, Inelastic scattering,</p>	<p>After the completion of the course, Students will be able to</p> <p>Explain the term of Nuclear mass and binding energy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept)</p> <p>Determine the applications of Energetics of alpha -decay, Range and straggling of alpha particles. Geiger-Nuttal law. Introduction of light charged particle (Beta-particle).</p> <p>Apply the knowledge the formula for Nuclear reactions, Elastic scattering, Inelastic scattering,</p>
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