



DPG DEGREE COLLEGE

(Affiliated to MDU Rohtak)

Sector-34, Near Marble Market, Gurugram 122001

MSC PROGRAMMS

Program Outcomes and Course Outcomes

M.Sc. Physics Program outcomes listed as follows:

Program Specific Outcomes

Students would be able to:

PSO1 To impart quality education and set high standards of comprehensive education by guiding students towards scientific excellence.

PSO2 Provide the students with vast range of Physics courses.

PSO3 Enhancing the ability of students to deal with mathematical formulas, fundamental concepts and practical.

	Course Objectives	Course Outcomes
1.	PHYSICS : M.SC FIRST YEAR(1ST SEMESTER)	
	18PHY21C1:Mathematical Physics	
	<ol style="list-style-type: none">1. To apply various mathematical theoretical models for the basic physics concepts.2. To analyze, classify, distinguish and simplify the problems of theoretical physics to be examine a practical problem.3. To maximize the student's ability to interpret, formulate and find solution for the general physics.	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none">1. By the end of this course students will be able to understand the various existing functions and theorems.2. Students of the course will be able to solve different theoretical problems of physics.3. Students will be able to understand the various applications of Mathematical Physics for other fields of physics.
	18PHY21C2: Classical Mechanics	

	<ol style="list-style-type: none"> 1. Students will have proficiency in the fundamental concepts of classical mechanics. 2. To develop the understanding of the complex physical phenomena related to motion of Complicated mechanical system. 3. To consolidate the deep understanding of the theory of kinematics and dynamics of system of particles. 4. To formulate the skills to solve problems quantitatively. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1 Students will be able to define and describe basic mechanical concepts related to discrete and continuous mechanical systems. 2 To justify variational principle to real physical problems. 3 To enable student to interpret Lagrangian and Hamiltonian approaches in both internal and rotating frames. 4 To get to know how to elaborate the methodologies and techniques appropriate to classical mechanics.
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	18PHY21C3: Quantum Mechanics I	
	<ol style="list-style-type: none"> 1. Use analytical thinking skills to evaluate information critically 2. Explain the necessity of quantum mechanics to explore behavior of sub atomic particles 3. Summarize the importance of all types of angular momentum along with eigen values calculations. 4. Explanation of Perturbation theory and explanation of first excited state of Hydrogen atom. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Develop mathematical background important for Quantum Mechanics descriptions. 2. Understanding of basic concepts of Quantum Mechanics which serve to formalize rules of Q.M. 3. Understanding of significance of Schrodinger equation, hydrogen atom and Harmonic oscillator 4. Ability to use analytical thinking skills to evaluate the content of course as it applies to modern technology
	18PHY21C4: Physics of Electronic Devices	
	<ol style="list-style-type: none"> 1. To understand the basic concepts of electronics with the introduction of semiconductors, energy band gap formation. 2. To analyze the charge carrier transport including diffusion and drift phenomenon for a Semiconductor to be use as a device formation. 3. To have an insight of various electronic devices such as LEDs, Solar cells, ICs by knowing their sunderlying physics. 	<p>After the completion of the course, students will be able to</p> <ul style="list-style-type: none"> • By the end of this course students will be acquainted with basics of band gap formation and role of charge carriers. • Students of the course will be able to understand different electronic devices. • Students will be able to understand various device working and mechanisms. • sBy the end of this course students will be able to understand the basic theory of electronic devices.

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	Course Objectives	Course Outcomes
1.	PHYSICS : M.SC FIRST YEAR(2nd SEMESTER)	
	18PHY22C1:Statistical Mechanics	
	1. To understand the macroscopic systems and their properties. 2. To understand the microscopic systems and their properties. 3. To understand Bose- Einstein and Fermi Dirac statistics.	After the completion of the course, students will be able to 1.define and describe ensemble theories. 2.differntiate between different ensemble theories. 3.explain the statistical behavior of Bose and Fermi statistics.
	18PHY22C2: Quantum Mechanics- II	
	1. Students will have proficiency in the fundamental concepts of quantum mechanics. 2. To develop the understanding of the complex physical phenomena related to perturbation. 3. To consolidate the deep understanding of the different kind of potentials	After the completion of the course, students will be able to 1 solve the Schrodinger equation of different kind of potentials. 2. statistics of identical particles. 3 have deep knowledge of perturbation methods
	18PHY22C3: Nuclear and Particle Physics	
	1.to understand the background of nuclear forces 2. Summarize different kind of models 3. Explanation of various kinds of decays 4. basics of particle physics	After the completion of the course, students will be able to 5. Develop understanding of nuclear forces and two nucleon system. 6. Understanding of basic concepts of nuclear models. 7. Understanding of significance of different kind of decays 8. Describe particle and elementary physics
	18PHY22D1: Solid State Physics	

	<p>1.To understand the basic concepts of solid state physics.</p> <p>2.To give fundamental insight of phonon and its properties.</p> <p>3. to understand physics of magnetic particles and concepts of superconductivity.</p>	<p>After the completion of the course, students will be able to</p> <ul style="list-style-type: none"> • By the end of this course students will be acquainted with basics of band gap formation and role of charge carriers. • Students of the course will be able to understand different models based on band theory. • Explain various types of magnetic behavior and physics behind them. • Explain superconductivity and its properties
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M.Sc Physics Program (2nd year) outcomes listed as follows:

Program Specific Outcomes

Students would be able to:

1. Have a clear vision of basics of physics and various principles along their applications.
2. Have knowledge of physics in various fields theoretical as well as practical.
3. Have a development of Research interests.
4. Critical thinking and problem solving ability.

M.SC IIIrd SEMESTER		
1.	Paper :19PHY23C1: Atomic & Molecular Physics	
	<p>1.To explain the atomic spectra of one and two electron atoms.</p> <p>2.To make understanding towards the behavior of atoms in external applied electric and magnetic field.</p> <p>3.To introduce the diatomic molecules and their rotational, vibrational and electronic Spectra</p>	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. The student will be able to explain Atomic and Molecular spectra of one and two electrons and find the eigen values and eigen vectors of a matrix. 2. Students would differentiate the Zeeman effect and different types of spectra. 3. Students would suggest the appreciate utilization of different spectroscopy and related applications in the field of spectroscopy/material science/ lasers.
2.	Paper : 19PHY23C2: Electrodynamics and Wave Propagation	

	<ol style="list-style-type: none"> 1. To review relativistic electrodynamics 2. Application of relativistic electrodynamics to various transformations 3. To understand the Radiative systems and energy distribution 4. To understand the propagation of waves in different media 	<p>After the completion of the course, Students will be able to</p> <ol style="list-style-type: none"> 1. Using the relativistic effect in different electrodynamics laws such as Maxwell's equations. 2. To solve various transformations. 3. To estimate energy distribution for different radiative systems. 4. Understanding of propagation and transmission of em waves.
3.	Paper: 19PHY23DA2 Electronics – I	
	<ol style="list-style-type: none"> 1. To explain basic physics and application of different types of electronic devices. 2. To introduce the concept of ICs, fabrication technology and also designing of switching circuits. 3. To express the function, characteristics and applications of op-amp 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. The students would be able to explain basic physics and application of different types of electronic devices. 2. Students familiar with integrated circuit fabrication technology, design of switching circuits. 3. Students would be able to express the function, characteristics and applications of Op-amp.
4.	Paper: 19PHY23DB1 Computational Physics –I	
	<ol style="list-style-type: none"> 1. Identify programming methods. 2. Identify and describe characteristics of various numerical methods. 3. Computationally sound students to solve a selection of problems in Physics. 4. Developing basic programming skills of FORTRAN. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. Demonstrate basic knowledge of numerical methods and programming skills. 2. Demonstrate basic skills to write and develop simple programs in FORTRAN. 3. Students learn to communicate effectively methods and results

M.SC IV SEMESTER

1.	Paper: 19PHY24C1 Physics of Laser and Laser Applications	
	<ol style="list-style-type: none"> 1. To introduce the concept of laser and its properties 2. To learn the difference type of lasers 3. To make students learn about the different mechanisms about laser emission 4. To understand the more about non linear optics mechanism for different emission. 	<p>After the completion of the course, Students will be able to</p> <ol style="list-style-type: none"> 1. To learn various type of emissions. 2. To have an insight of various lasers. 3. To learn about nonlinear effects and their applications in emission. 4. To learn applications of lasers inn various fields.
2.	Paper: 19PHY24C2 Physics of Nanomaterials	
	<ol style="list-style-type: none"> 1.To study basic concepts of nanomaterials 2.To study nanomaterials in one, two and three dimensions 3.To study various synthesis methods of nanomaterials 4.To study about characterization as various structural and spectroscopic methods. 	<p>After the completion of the course, Students will be able to</p> <p>Learn about the basic fundamentals of nanomaterials</p> <p>Have knowledge of nanomaterials in different confinement zone.</p> <p>Learn about applications of nanomaterials in various fields.</p> <p>Learn about fabrication methods for device applications</p>
3.	Paper : 19PHY24DA2 Electronics – II	
	<ol style="list-style-type: none"> 1.To understand various number systems and their application to Boolean algebra. 2.To learn various digital circuits 3.To understand gates as an application of digital electronics 4.To understand the modulation process. 	<p>After the completion of the course,students will be able to</p> <ol style="list-style-type: none"> 1. Learn about basic laws for digital input and output calculations 2. Learn digital circuit applications 3. Learn Gates mechanism for semiconductor devices 4. Learn modulation techniques for data transmission.
4.	Paper: 19PHY24DB1Computational Physics –II	
	<ol style="list-style-type: none"> 1. To understand the various computational methods as Monte Carlo. 2. To understand the numerical methods and their application to circuits 3. 3.To learn the programming language MATLAB 	<p>After the completion of the course,students will be able to</p> <ol style="list-style-type: none"> 1. To solve physical proceses as radioactive decay, motion of harmonic oscillator.

	4. To learn the applications of MATLAB in various calculations	2. To solve numerical solutions to various physical processes. 3. To apply MATLAB programming for statistical analysis
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