



**PREM CHAND MARKANDA COLLEGE FOR WOMEN,  
JALANDHAR CITY**

**Re-accredited 'A+' grade (2<sup>nd</sup> Cycle) by NAAC Bangalore**

**A unique prestigious Post Graduate Institution of Northern India**

**COURSE OUTCOME**

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 1<sup>st</sup>**

**Course/Paper name- Mechanics**

**After completing this course, the student will be able to –**

<b>CO1</b>	<b>Demonstrate the simple phenomenon concerning motion in our daily life.</b>
<b>CO2A</b>	<b>Apply the conservation laws in many physical phenomenon.</b>
<b>CO3F</b>	<b>Formulate the mathematical relations based on physical phenomenon.</b>
<b>CO4D</b>	<b>Demonstrate the ability to justify and explain their thinking and approach.</b>
<b>CO.5</b>	<b>Elaborate and explain the concept of relativity with applications.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 1<sup>st</sup>**

**Course/Paper name- Electricity and Magnetism**

**After completing this course, the student will be able to -**

<b>CO1D</b>	Students will be able to understand the concept of the electric force, electric field and electric potential for stationary charges
<b>CO2A</b>	They are able to calculate electric potential and electric field by using Gauss's law.
<b>CO3F</b>	Student will understand the dielectric phenomenon and effect of electric field on dielectric.
<b>CO4D</b>	Study the concept of magnetic field, magnetic field for steady currents using Biot-Savart's and Ampere's Circuital laws.
<b>CO.5</b>	Student will learn magnetic materials and its properties.

#### DEPARTMENT- PHYSICS

Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)

Semester- 2<sup>nd</sup>

Course/Paper name- Relativity and Electromagnetism After completing this course, the student will be able to -

<b>CO.1</b>	Describe and understand the basic concepts underpinning electricity and magnetism such as potential and field.
<b>CO.2</b>	Understand the relationship between electric and magnetic fields.
<b>CO.3</b>	Calculate the electrostatic and magnetic fields produced by static and moving charges in a variety of simple configurations.
<b>CO.4</b>	Identify and apply appropriate theoretical techniques to solve a range of different problems in electromagnetism.
<b>CO.5</b>	Elaborate and explain the concept of relativity with applications.

#### DEPARTMENT- PHYSICS

Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)

**Semester- 2<sup>nd</sup>**

**Course/Paper name- Vibration and Waves**

**After completing this course, the student will be able to -**

<b>CO.1</b>	<b>Learn how a body oscillates without damping amplitude and what the necessary conditions are for it.</b>
<b>CO.2</b>	<b>Learn how we can set any object in the forced oscillations that is in continuous motion</b>
<b>CO.3</b>	<b>Doppler effect and its use in day-to-day life. Using these concept students can get ideas of expanding the universe.</b>
<b>CO.4</b>	<b>Studying sound concept we can understand why the sound of male and female are different and the reason behind it.</b>
<b>CO.5</b>	<b>Elaborate and explain the concept of waves with applications.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 3<sup>rd</sup>**

**Course/Paper name- Thermodynamics and Statistical Physics After completing this course, the student will be able to -**

<b>CO.1</b>	<b>Understand important topics of thermodynamics and statistical physics.</b>
<b>CO.2</b>	<b>Develop critical thinking and appropriate problem solving skills.</b>
<b>CO.3</b>	<b>Solve quantitative problems pertaining to the course.</b>
<b>CO.4</b>	<b>Apply concepts learned in lecture to real-life problems and situations.</b>
<b>CO.5</b>	<b>Student learns the different laws of thermodynamics.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 3<sup>rd</sup>**

**Course/Paper name- Optics and Laser**

**After completing this course, the student will be able to -**

<b>CO.1</b>	<b>Image formation related to geometrical optics, Deviation, Magnification.</b>
<b>CO.2</b>	<b>Different types of monochromatic and chromatic aberrations and Achromatic in lenses.</b>
<b>CO.3</b>	<b>Construction and working of Simple Microscope, Compound Microscope, Huygen's Eyepiece.</b>
<b>CO.4</b>	<b>Interference and diffraction of light, Formation of fringes, Resolution</b>
<b>CO.5</b>	<b>Concept of Polarization, Double refraction, Construction and working of Nicol Prism.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 4<sup>th</sup>**

**Course/Paper name- Atomic and Molecular Spectra**

**After completing this course, the student will be able to -**

<b>CO.1 D</b>	<b>Describe theories explaining the structure of atoms and the origin of the observed spectra.</b>
<b>CO.2</b>	<b>Identify atomic effect such as Zeeman effect and Stark effect.</b>
<b>CO.3 L</b>	<b>List different types of atomic spectra.</b>
<b>CO.4 E</b>	<b>Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields.</b>
<b>CO.5 E</b>	<b>Explain different Laser used and make a comparison between them.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 4<sup>th</sup>**

**Course/Paper name- Quantum Mechanics**

**After completing this course, the student will be able to -**

<b>CO.1 D</b>	<b>Introduction to Quantum Mechanics, Historical background, Matter Waves, Wave particle duality.</b>
<b>CO.2</b>	<b>Able to understand concepts of Phase and Group Velocity, Heisenberg's Uncertainty Principle.</b>
<b>CO.3 L</b>	<b>Physical Interpretation of Wave function, Schrödinger's Wave Equation, Eigen Function and Eigen values.</b>
<b>CO.4 E</b>	<b>Free Particle, One Dimensional and Three Dimensional Rigid Box, Potential Barrier.</b>
<b>CO.5 E</b>	<b>Hermitian and other operators in Quantum Mechanics, Commutator brackets and concept of parity.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc.**

**Semester- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Course/Paper name- Electronics**

**After completing this course, the student will be able to -**

<b>CCO1</b>	<b>Apply mathematical problems and solutions in aspect of science and technology.</b>
<b>CCO2</b>	<b>Understand the value of mathematical proof.</b>
<b>CCO3</b>	<b>Assist, Assemble, Modify and Test electronic circuit in accordance with job requirements.</b>
<b>CCO4</b>	<b>Develop the advance experimental techniques based on electronics.</b>
<b>CCO5</b>	<b>Apply the mathematical tools to explain the electronics and allied phenomenon.</b>

**DEPARTMENT- PHYSICS**

**Name of the class- B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester- 5th**

**Course/Paper name- Condensed Matter Physics**

**After completing this course, the student will be able to -**

<b>CO11 s</b>	Students will be able to study the difference between crystalline and amorphous material, crystal structures, Miller indices, interplanar distances, interatomic forces and bonds. From this study students get to learn the basics of solid state physics.
<b>CO22 U chara</b>	Students will understand Bragg's diffraction, Bragg's law. X-ray diffraction and characterization techniques. With the help of this knowledge students know the principles of structure determination by X-ray diffraction method. This would be helpful in performing experiments in nanotechnology.
<b>CO33 1. E Bloch</b>	Students can understand electrical and thermal conductivity of free electron in metals, Energy levels of free electrons in one and three dimensions. They will learn the significance of Pauli's exclusion principle, theorem, Fermi energy, and Hall Effect and energy bands in materials.
<b>CO34 D</b>	Students can describe and explain the behavior of permanent magnet including induced magnetism, behavior of paramagnetic, diamagnetic, ferromagnetic materials in terms of magnetic domain.
<b>CO45 1.</b>	Students can understand superconducting materials, their properties and technological applications of superconductivity.

**DEPARTMENT- PHYSICS**

**Name of the Class – B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester – 6th**

**Course/Paper name- Nuclear Physics**

**After completing the course, the student will be able to -**

<b>CO1</b>	<b>Understand about the powerful nuclear apparatus and applications.</b>
<b>CO2</b>	<b>Explain about the structure of atom and the relevant theories.</b>
<b>CO3</b>	<b>Formulate the simple equations regarding nuclear reactions.</b>
<b>CO4</b>	<b>Study the hazards of radioactive radiation.</b>
<b>CO5</b>	<b>Use nuclear energy in useful purpose.</b>

**DEPARTMENT- PHYSICS**

**Name of the Class – B.Sc. (Non Med), B.Sc.(C.Sc.)**

**Semester – 6th**

**Course/Paper name- Radiation and Particle Physics**

**After completing the course, the student will be able to -**

<b>CO1</b>	<b>Knowledge about Interaction of Radiation and Charged Particles With Matter.</b>
<b>CO2</b>	<b>Student learnt by using accelerators we can produce high energy particle which can be used for research purpose</b>
<b>CO3</b>	<b>Use of nuclear reactors to produce a huge amount of heat energy.</b>