

GDC Memorial College, Bahal (Bhiwani)

**Department of PHYSICS**

2017-18(Even)

**Learning Objective & Outcomes**

**B.Sc.1<sup>st</sup> Semester**

**Subject : MECHANICS**

**Subject Code : PHY:101**

**Learning Objective**

1. The students will introduce about the forces, angular momentum and knowledge about the Constraint .
2. The course will give knowledge about the general parameter like velocity, acceleration.
3. The course provide the students about the knowledge of M.I.
4. The course provide the students about the knowledge of hollow cylinder and solid cylinder.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Get the knowledge about forces help the students in their daily life.
2. The velocity and acceleration parameter give the knowledge about how the vehicles Move.
3. The information will teach the students about the rolling concept.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18(Odd)

**Learning Objective & Outcomes**

**B.Sc. 1st Semester**

**Subject : Electricity and Magnetism**

**Subject Code : PHY102**

**Learning Objective**

1. This paper deals with the study of Electric field, Magnetic field, and Electromagnetic theory.
2. The first unit gives the mathematical idea behind the electrostatic field.
3. The second unit deals with the physics behind the Magnetostatics.
4. Last unit deals with the electromagnetic theory.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Explain various phenomenon like Ferromagnetism, ant ferromagnetism etc.
2. Understand the relation in between Electromagnetic theory.
3. Explain various phenomenon in light of maxwell equations.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18 (Even)

**Learning Objective & Outcomes**

**B.Sc. 2<sup>nd</sup> Sem.**

**Subject: Properties of Matter, Kinetic Theory and Relativity      Subject code: PHY-201**

**Learning Objective**

This Course Enables the Student

1. To describe the concept of stress/strain and in its relation to force/displacement
2. To know the effect of forces during static conditions.
3. To determine axial forces, shear forces and bending moments
4. To express the relationship between the pressure and the average kinetic energy of gas molecules in the form of equation
5. To express the five basic assumptions of the Kinetic Molecular Theory of Gases.
6. To introduce students to the concept of special relativity and its applications to Physical Sciences

**Learning Outcomes**

Upon successful completion of this course it is intended that a student will be able to:

1. Students will be able to identify the type of force, type of supports and the reactions on beams and plane frames.
2. The students shall be familiar with the fundamental principles of the general theory of relativity. They shall know the meaning of basic concepts like the equivalence principles, inertial frames and time dilation
3. Establish the non-existence of the hypothesized stationary aether through the null result of Michelson-Morley experiments with interferometer.
4. Explain the true nature of Newtonian mechanics and Lorentz Transformation equations.
5. Understand the concept of constant relative motion of different bodies in different frames of references

GDC Memorial College, Bahal (BHiwani)

**Department of PHYSICS**

2017-18(Even)

**Learning Objective & Outcomes**

**B.Sc. 2<sup>nd</sup> Semester**

**Subject : Electromagnetic Induction & Electronic Devices**

**Subject Code : PHY-202**

**Learning Objective**

1. The objective of the course is to appraise the students about the electronics industry.
2. To learn about the electronic component like Diode, transistor etc.
3. Structural analysis about the e component.
4. Knowledge about resistance inductor and capacitor.

**Learning Outcomes**

After the completion of the course, Students will be able to :

1. Students shall learn about the significance of electric components.
2. Significance of various devices and how they will operate.
3. It will teach the students about the circuit connection.
4. About the graphical relationship of resistance, capacitor and inductor.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18(Odd)

**Learning Objective & Outcomes**

**B.Sc. 3<sup>rd</sup> Semester**

**Subject : Computer Programming & Thermodynamics**

**Subject Code : PHY-301**

**Learning Objective**

1. Develop a greater understanding of the issues involved in programming language design and implementation.
2. Develop an in-depth understanding of functional, logic, array etc.
3. Students learn about the concepts of heat, work, and energy.
4. Student learns the different laws of thermodynamics.
5. To learn thermo-dynamical functions and there relations.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Understand the FORTRAN programming language.
2. Be capable of specifying the simplified syntax of programming languages (Fortran).
3. Understand the concept of thermodynamics and there laws.
4. Understand the Heat Engine and there uses.
5. Describe the thermodynamic function and there relations.

GDC Memorial College, Bahal (BHiwani)

**Department of Physics**

2017-18(Odd)

**Learning Objective & Outcomes**

**B.Sc. 3<sup>rd</sup> Semester**

**Subject : Optics I**

**Subject Code : PHY-302**

**Learning Objective**

1. The main objective of this subject is to aware the students about various phenomenon of waves and optics.
2. First unit of deals with the Fourier analysis and Fourier transformation.
3. The second deals with the matrix method in order to explain various phenomenon.
4. The third unit describe the Phenomenon like interference phenomenon.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Understand the physics behind various phenomenon in wave and optics.
2. Understand various phenomenon and the cause or origin of them.
3. Explain the relationship in between various optical phenomenon with the Fourier series and matrix.

GDC Memorial College, Bahal (BHiwani)

**Department of Physics**

2017-18(Even)

**Learning Objective & Outcomes**

**B.Sc. 4<sup>th</sup> Semester**

**Subject : Statistical Mechanics**

**Subject Code : PHY 401**

**Learning objectives**

1. This course in statistical mechanics provides the basic idea of probability to the students. There are ways of calculating probability for various statistical system of particles.
2. Students will study basic ideology of phase space, microstate, macrostate.
3. The objective is to apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability.
4. The course gives the insight of postulates of statistical physics.
5. Students will learn the different types of statistics distribution and particles. They will learn which particles follow which statistics and why.
6. The aim is to apply these statistical distribution in real life problems and understand their problems.
7. Many real system of particles will be dealt throughout the course to relate the theoretical knowledge to practical one.

**Learning outcomes**

1. After taking this course students are able to determine the probability of any type of events. They are able to interpret different types of events.
2. Students have understood the concept of phase space and its volume.
3. They can easily distinguish between different types of particles and statistics and can easily distribute bosons, fermions and classical particles among energy levels.
4. After studying Fermi dirac statistics, students have learnt to deal with many electron system in real life.

GDC Memorial College, Bahal (BHiwani)

**Department of Physics**

2017-18(Even)

**Learning Objective & Outcomes**

**B.Sc. 4<sup>th</sup> Semester**

**Subject : Optics II**

**Subject Code : PHY-402**

**Learning Objective**

1. The main objective of this subject is to aware the students about various phenomenon of optics.
2. The study of the paper describe the phenomenon like Interference, Diffraction and Polarization.
3. The study describe the principals behind various phenomenon as described earlier.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Understand the physics behind various optical phenomenon.
2. Understand various natural phenomenon which is happening in their surroundings.
3. Explain the relationship in between various optical phenomenon.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18 (Odd)

**Learning Objective & Outcomes**

**B.Sc. 5<sup>th</sup> Semester**

**Subject: Solid State Physics**

**Subject code: PHY-501**

**Learning Objective**

This Course Enables the Student to

1. Describe the difference between crystalline and amorphous materials.
2. Describe the arrangement of atoms and ions in crystalline structures
3. Schematically diagram face-centered cubic, body-centered cubic and hexagonal close-packed unit cells.
4. Recognize and also give the lattice parameter relationships for all seven crystal systems--i.e., cubic, hexagonal, tetragonal, rhombohedral, orthorhombic, monoclinic, and triclinic.
5. Given a unit cell and the Miller indices for a plane, draw the plane represented by these indices referenced to this unit cell.
6. Given the unit cell for some crystal structure, be able to draw the atomic packing arrangement for a specific crystallographic plane.
7. Explain the use of X-ray diffraction measurements in determining crystalline structures

**Learning Outcomes**

Upon successful completion of this course it is intended that a student will be able to:

1. Demonstrate an understanding of the crystal lattice and how the main lattice types are described
2. formulate the theory of X-ray diffraction in the reciprocal lattice (k-space) formalism and apply this knowledge to generalize the formulation for matter waves
3. be able to perform structure determination of simple structures
4. Learn that Dulong-Petit Law is valid only at high temperature.
5. Learn that lattice specific heat of solid vary  $T^3$  at very low temperature.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18(Odd)

**Learning Objective & Outcomes**

**B.Sc. 5<sup>th</sup> Semester**

**Subject : Quantum mechanics**

**Subject Code : PHY-502**

**Learning Objective**

1. To study the basic principles of quantum mechanics.
2. Explain the operator formulation of quantum mechanics.
3. Student learn the concept of wave function.
4. Student will learn Schrodinger equation and their applications.
5. To study role of uncertainty in quantum physics.

**Learning Outcomes**

After the completion of the course, Students will be able to

1. Pinpoint the historical aspects of development of quantum mechanics.
2. Understand and explain the differences between classical and quantum mechanics.
3. Understand the idea of wave function.
4. Understand the uncertainty relations.
5. Solve Schrodinger equation for simple potentials.

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18(Even)

**Learning Objective & Outcomes**

**B.Sc.(Physics) 6<sup>th</sup> Semester**

**Subject : Atomic, Molecular and Laser Physics**

**Subject Code : PHY-601**

**Learning Objective**

1. Describe the atomic spectra of one and two valance electron atoms.
2. Explain the change in behaviour of atoms in external applied electric and magnetic field.
3. Explain rotational, vibrational, electronic and Raman spectra of molecules.
4. Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.
5. Basic Laser principles, Laser behaviour, Properties of laser radiations, Different types of Lasers and Laser applications

**Learning Outcomes**

After the completion of the course, Students will be able to

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

GDC Memorial College, Bahal (Bhiwani)

**Department of Physics**

2017-18(Even)

**Learning Objective & Outcomes**

**B. Sc. 6<sup>th</sup> Semester**

**Subject : Nuclear Physics**

**Subject Code : PHY 602**

**Learning objectives**

1. This is a basic course in Physics which deals with the phenomena taking place in the nuclear domain. Students will be given an insight into the dimensions of a nucleus.
2. The aim is to tell them about the stability of nucleus and various other properties.
3. The students will learn about various types of radiations and their interaction with matter.
4. The course is such designed to teach students about various types of nuclear reactions and their energetics.
5. Students will learn the methods to find the mass and charge of any nucleus by using some instruments.
6. Various ways will be taught to extract energy from nuclei in real life.

**Learning outcomes**

1. After taking this course, students are able to determine the charge, mass of any nucleus by using various spectrograph.
2. They are able to understand the size of nucleus and all its properties.
3. This course has led the students to understand interaction of various types of radiation with matter which they observe in their daily life. It's easy for them now to relate the theory to practical.
4. Students now know various methods of accelerating various types of particles to perform scattering experiments.
5. Students are able to understand the detecting methods and instruments for different types of charged and neutral particles.