Ref No………………   Date……………………

Physics- Course Outcome

B.Sc. 1st Semester

Subject: Mechanics (Subject Code: PHY-101)
➢ **After studying this student would be able to:**
   ❖ specify an appropriate frame of reference for a given physical situation
   ❖ express one-dimensional. two-dimensional and three-dimensional vectors using unit
   ❖ vectors
   ❖ compute the sum, difference, scalar and vector products of two vectors
   ❖ determine the displacement, velocity and acceleration of a particle in a given frame of
   ❖ reference
   ❖ distinguish between average and instantaneous velocity, and average and instantaneous
   ❖ acceleration
   ❖ determine relative velocity and acbeleration of one particle with respect to another
   ❖ solve problems concerning relative motion and uniform circular motion.
   ❖ Torsional pendulum and time period calculation
   ❖ Moment of Inertia and calculation MI of an irregular body

Subject: Electricity and Magnetism (Subject Code: PHY-102)
➢ **After studying this student would be able to:**
   ❖ carry out simple calculations involving the motion of charged particles in a uniform electric field,
   ❖ describe the main features of the motion of charge in a magnetic field, and define the term cyclotron frequency,
   ❖ explain the helical trajectory of a, charged particle moving in a uniform magnetic
   ❖ explain the working principle of Cathode Ray Oscilloscope,
   ❖ Appreciate the applications of the combined electric and magnetic fields acting perpendicular to each other.
   ❖ understand and explain the terms: ferromagnetism, amperian current, magnetisation, magnetic intensity HI magnetic susceptibility, magnetic permeability, relative permeability,
   ❖ relate Magnetisation and the atomic currents within the material,
   ❖ derive and understand the differential and integral equations for M and H and apply these to calculate fields for simple situation,
   ❖ explain the concept of electric current and obtain the expression for current density in terms of the drift velocity,

- ❖ explain the mechanism microscopically, distinguish between ohmic and non-ohmic behaviour,
- ❖ use the continuity equation to discuss the behaviour of current in a diode.
- ❖ understand what is meant by the magnetic field, the right hand rule, Biot-Savart law, right hand method, Ampere's law,
- ❖ define the magnetic field at a point in terms of the force on a steady current element and also on a moving charged particle,
- ❖ use the formula for the force on a steady current element-or on charged particle due to a magnetic field to calculate the force on a certain simple current carrying circuits, and solve simple problems

B.Sc. 2nd Semester

Subject: Properties of Matter, Kinetic Theory and Relativity (Subject code: PHY-201)
> ➢ **After studying this student would be able to:**
>> - ❖ Basic definitions (stress, strain, Hooke's law and Poisson's ratio) of elasticity
>> - ❖ Stress – Strain Diagram
>> - ❖ Three types of modulus
>> - ❖ Torsional Pendulum - determination of rigidity modulus and time period.
>> - ❖ Moment of Inertia and calculating MI of an irregular body
>> - ❖ Definitions of elasticity
>> - ❖ Three types of modulus
>> - ❖ Bending of beams and expression for bending moment
>> - ❖ Definition of Cantilever and expression for depression and elevation
>> - ❖ Expression for Young's Modulus by Uniform and Non-Uniform bending
>> - ❖ Students will be able to identify the type of force, type of supports and the reactions on beams and plane frames.
>> - ❖ 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 establish the non-existence of the hypothesized stationary aether through the null result of Michelson-Morley experiments with interferometer.
>> - ❖ This subject explains the true nature of Newtonian mechanics and Lorentz Transformation equations. Also, students understand the concept of constant relative motion of different bodies in different frames of references.

Subject: Electromagnetic Induction & Electronic Devices (Subject Code: PHY-202)
> ➢ **After the completion of the course, Students will be able to:**
>> - ❖ Learn about the significance of electric components.
>> - ❖ Know significance of various devices and how they will operate.
>> - ❖ Understand the circuit connection.
>> - ❖ Define the graphical relationship of resistance, capacitor and inductor.

B.Sc. 3rd Semester

Subject: Computer Programming & Thermodynamics (Subject Code: PHY-301)
> ➢ **After studying this student would be able to:**
>> - ❖ Students understand the FORTRAN programming language.

- ❖ They become capable of specifying the simplified syntax of programming languages (FORTRAN).
- ❖ They understand the concept of thermodynamics and their laws.
- ❖ They learn the Heat Engine and they are able to describe the thermodynamic function and their relations.
- ❖ Laws (Zeroth, First and Second) of Thermodynamics
- ❖ Transport Phenomena and Maxwell's expression of Velocity determination
- ❖ Carnot's theorem and Reversible and Irreversible processes
- ❖ Entropy - Reversible and Irreversible processes, Temp-Entropy diagram

Subject: Optics I (Subject Code: PHY-302)
  ➢ **After studying this student would be able to:**
- ❖ Students are able to understand the physics behind various phenomenon in wave and optics.
- ❖ Students are able to understand the various phenomenon and the cause or origin of them.
- ❖ Understand the relationship in between various optical phenomenon with the Fourier series and matrix.

B.Sc. 4th Semester

Subject: Statistical Mechanics (Subject Code: PHY 401)
- ❖ Students are able to interpret the probability and able to solve mathematical and daily life problems/ numericals related to it.
- ❖ Students can understand the concept of phase space and its volume.
- ❖ They can easily distinguish between different types of particles and statistics and can easily distribute bosons, fermions and classical particles among energy levels.
- ❖ After studying Fermi Dirac statistics, students have to deal with electron system in real life.

Subject: Optics II (Subject Code: PHY-402)
After the completion of the course, Students will be able to:
- ❖ Understand the physics behind various optical phenomenons like interference, diffraction etc.
- ❖ Understand various natural phenomenon are which is happening in their surroundings.
- ❖ Explain the relationship in between various optical phenomenon. Understand the basic concept of probability and applications involving probability.

B.Sc. 5th Semester

Subject: Solid State Physics (Subject code: PHY-501)
  ➢ **After the completion of the course, Students will be able to:**
- ❖ Demonstrate an understanding of the crystal lattice and how the main lattice types are described.
- ❖ 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 that are able to perform structure determination of simple structures.
- ❖ Learn that Dulong-Petit Law is valid only at high temperature.
- ❖ Learn that lattice specific heat of solid vary $T3$ at very low temperature.

Subject: Quantum mechanics (Subject Code: PHY-502)
  ➢ **After the completion of the course, Students will be able to:**
- ❖ Understand historical aspects of development or origin of quantum mechanics.
- ❖ Explain the differences between classical and quantum mechanics.

- ❖ Understand the idea of wave function and its physical significance.
- ❖ Understand the uncertainty principal and solved the various problem based on it.
- ❖ Solve Schrodinger equations for simple potentials barrier, particle in infinite potential box and harmonic oscillator.

B.Sc. 6th Semester

Subject: Atomic, Molecular and Laser Physics (Subject Code: PHY-601)
- ➢ **After the completion of the course, Students will be able to:**
- ❖ Describe theories explaining the structure of atoms and the origin of the observed spectra.
- ❖ Identify atomic effect such as Zeeman Effect and Stark effect.
- ❖ List different types of atomic spectra.
- ❖ Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields.
- ❖ Use the different type of Laser used in various applications and comparative study of different type of laser.

Subject: Nuclear Physics (Subject Code: PHY 602)
- ➢ **After studying this student would be able to:**
- ❖ After taking this course, students are able to determine the charge, mass of any nucleus by using various spectrographs and explain the ground state properties of the nucleus for study of the nuclear structure behavior.
- ❖ They are able to understand the size of nucleus and all its properties.
- ❖ This course has led the students to understand interaction of various types of radiation with matter which they observe in their daily life. It is easy for them now to relate the theory to practical.
- ❖ Students now know various methods of accelerating various types of particles to perform scattering experiments.
- ❖ Students are able to understand the detecting methods and instruments for different types of charged and neutral particles.