DEPARTMENT OF PHYSICS
S.D.Women's College, Rajgangpur
PHYSICS (B.Sc)

1. PROGRAMME OUTCOMES (PO):-

PO1: Demonstrate a thorough conceptual understanding in the core areas of physics (Classical mechanics, electrodynamics, statistical mechanics, quantum mechanics and the supporting mathematics including the range of validity of key concepts

PO2: Identify the most relevant physics concepts in approaching a messy problem that might arise in everyday life, and devise a strategy in order to arrive at the solution

PO3: Function effectively as an individual, and as a member or leader in diverse teams and in multi- disciplinary settings.

PO4: Locate existing scientific research relevant to a given topic and evaluate its accuracy

PO5: Students will participate and succeed in competitive examinations for PG programs& Govt. services.

PO6: Communicate the results of scientific work effectively making use of clear and well organized writing and presentation skills and employ equations and visualizations tools as needed.

2. PROGRAMME SPECIFIC OUTCOMES (PSO):-

PSO1: To understand the basic laws and explore the fundamental concepts of Physics

PSO2: To carry out experiments to understand the laws and concepts of Physics

PSO3: To apply the theories learnt and the skills acquire to solve the real time problems

PSO4: To produce graduates who excel in the competences and values required for leadership to serve global community

PSO5:.To apply and verify the theoretical concepts and facts by laboratory experiments.

3. COURSE OUTCOMES (CO'S):-

I SEMESTER:

Core 1: MATHEMATICAL PHYSICS-I: Calculus, Vector Algebra, Orthogonal Coordinates, Dirac delta function, Vector Differentiation and Integration.

Core 2: MECHANICS: Rotational dynamics, Non-inertial systems, Elasticity, Fluid Motion, Gravitation and Central Force Motion, Oscillation, Special Theory of Relativity.

II SEMESTER:

Core 3: ELECTRICITY AND MAGNETISM: Electric field and potential, Magnetic field, Dielectric properties, Electromagnetic induction, Electrical circuit and Network Theorem.

Core 4: WAVES AND OPTICS: Geometrical Optics, Wave motion, Interference, Fraunhofer Diffraction

III SEMESTER:

Core 5: MATHEMATICAL PHYSICS-II: Fourier Series, Frobenius method, Polynomials, Partial Differential

Core 6: THERMAL PHYSICS: Introduction to thermodynamics and law of Thermodynamics, Entropy, Thermodynamic Potentials, Maxwell's Thermodynamic relations, Kinetic Theory of Gases, Real Gases.

Core 7: DIGITAL SYSTEMS AND APPLICATION: Integrated circuits, Digital circuits, Boolean Algebra, Introduction to CRO, Data processing circuits, Arithmetic circuits, Timers, Shift Registers, Counters

IV SEMESTER:

Core 8: MATHEMATICAL PHYSICS-III: Complex Analysis, Integral Transforms, Application of Fourier transforms, Laplace transforms, Derivatives and integrals of Laplace Transforms.

Core 9: ELEMENTS OF MODERN PHYSICS: Atomic spectra and models, Bohr Theory, Wave-particle Duality, Heisenberg Uncertainty Principle, Nuclear Physics, Fission and Fusion.

Core 10: ANALOG SYSTEM AND APPLICATIONS: Semiconductor diodes, two-terminal devices, types of diodes, BJT, Amplifiers, Coupled amplifiers, Feedback in amplifiers, OP-AMPS and application.

V SEMESTER:

Core 11: QUANTUM MECHANICS AND APPLICATIONS: Schrodinger equation and operators, Time-independent Schrodinger equation, Bound states in arbitrary potential, one-dimensional rigid box, atoms in electric and magnetic fields and external magnetic fields.

Core 12: SOLID STATE PHYSICS: Crystal structure, Lattice dynamics, Magnetic properties of matter, dielectric properties of matter, band theory, LASERS, Superconductivity.

DSE 1: CLASSICAL DYNAMICS: Classical mechanics of point particles, Hamiltonian, Small oscillation and canonical transformation, Special Theory of relativity.

DSE 2: NUCLEAR AND PARTICLE PHYSICS: General properties of nuclei, Nuclear models, Radioactivity decay, Nuclear reactions, Detector of Nuclear radiations, Particle accelerator, Particle physics.

VI SEMESTER:

Core 13: ELECTROMAGNETIC THEORY: Maxwell's equation, EM waves in bounded and unbounded media, Optical fibers and polarization of EM waves.

Core 14: STATISTICAL MECHANICS: Classical Statistics and Thermodynamic functions, Radiation, Quantum statistics

DSE 3: NANO MATERIALS AND APPLICATIONS

In the nano systems and its implications in modifying the properties of materials at the nano scale. Concept of Quantum confinement 3D, 2D, 1D AND 0D nanostructure with examples. Optical properties of nano structured materials, modification of band gap, excitonic confinement

DSE 4: DISSERTION AND PROJECT