COURSE-I

CBCS/SEMESTERSYSTEM B.Sc.PHYSICS

MECHANICS, WAVES AND OSCILLATIONS

Course Outcomes (Theory)

CO 1: Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering crosssection.

CO 2: Apply the rotational kinematic relations, the principle and working of gyroscope andits applicationsand the precessional motion of a freely rotating symmetric top.

CO 3: Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

CO 4: Understand postulates of Special theory of relativity and its Consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

CO 5: Examine phenomena of simple harmonic motionand the distinction between un damped, damped and forced oscillations and the concepts of resonance and quality factor withreference to damped harmonic oscillator.

CO 6: Appreciate the formulation of the problem of coupled oscillations and solve them to btain normal modes of oscillation and their frequencies in simple mechanical
systems.

CO 7: Figure out the formation of harmonics and overtones in a stretched string and

Acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.

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Practical Course 1: Mechanics, Waves and Oscillations

Course outcomes (Practicals):

CO1: Perform experiments on Properties of matter such as the determination of moduli of elasticity viz., Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.

CO2: Know how to determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum.

CO3: Notice the difference between flat resonance and sharp resonance in case of volume resonator and sonometer experiments respectively.

CO4: Verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration.

CO5: Demonstrate the formation of stationary waves on a string in Melde's string experiment.

CO7: Observe the motion of coupled oscillators and normal modes.

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COURSE-II

CBCS/SEMESTERSYST B.Sc. PHYSICS

WAVE OPTICS

CourseOutcomes (Theory)

CO1: Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.

CO2: Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe thediffraction patterns in the case of single slit and the diffraction grating.

CO3: Describe the construction and working of zone plate and make the comparison of zoneplate with convex lens.

CO4: Explain the various methods of production of plane, circularly and polarized light andtheir detection and the concept of optical activity.

CO5: Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasersand their applications in different fields.

CO6: Explain about the different aberrations in lenses and discuss the methods of minimizing them.

CO7: Understand the basic principles of fibreoptic communication and explore the field of Holography and Nonlinear optics and their applications.

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Practical Course II: Wave Optics

Course outcomes (Practicals):

CO1: Gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc.

CO2: Understand the principle of working of polarimeter and the measurement of specific rotatory power of sugar solution.

CO3: Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism.

CO4: Be familiar with the determination of refractive index of liquid by Boy's method and the determination of thickness of a thin wire by wedge method.

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COURSE-III

CBCS/SEMESTERSYSTEM B.Sc. PHYSICS

HEAT AND THERMODYNAMICS

CourseOutcomes (Theory)

CO1: Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions

And the transport phenomenon in ideal gases.

CO2: Gain knowledge on the basic concepts of thermodynamics, the first and the second lawof thermodynamics, the basic principles of refrigeration,the concept of entropy,thethermodynamic potentials and their physical interpretations.

CO3: Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency.

CO4: Develop critical understanding of concept of Thermodynamic potentials, the formulation of Maxwell's equations and its applications.

CO5: Differentiate between principles and methods to produce low temperature and liquefyand also understand the practical applications of substances at low temperatures.

CO6: Examine the nature of black body radiations and the basic theories.

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Practical Course II: HEAT AND THERMODYNAMICS

Course outcomes (Practicals):

CO 1: Perform some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, variation of thermo-emf of athermocouple with temperature difference at its two junctions, calibration of a thermocouple and Specific heat of a liquid.

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COURSE-IV

CBCS/SEMESTERSYSTEM

B.Sc.PHYSICS
ELECTRICITY, MAGNETISM AND ELECTRONICS

CourseOutcomes (Theory)

CO1: Understand the Gauss law and its application to obtain electric field in different casesand formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant.

CO2: Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.

CO3: Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.

CO4: Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.

CO5: Phenomenon of resonance in LCR AC-circuits, sharpness of resonance,Q-factor,Power factor and the comparative study of series and parallel resonant circuits.

CO6: Describe the operation of p-n junction diodes, zener diodes, light emitting diodes andtransistors.

CO7: Understand the operation of basic logic gates and universal gates and their truth tables.

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Practical Course II: ELECTRICITY, MAGNETISM AND ELECTRONICS

Course outcomes (Practicals):

CO1: Measure the current sensitivity and figure of merit of a moving coil galvanometer.

CO2: Observe the resonance condition in LCR series and parallel circuit.

CO3: Learn how a sonometer can be used to determine the frequency of AC-supply.

CO4: Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus.

CO5: Understand the operation of PN junction diode, Zener diode and a transistor and theirV-I characteristics.

CO6: Construct the basic logic gates, half adder and full adder and verify their truth tables.Further, the student will understand how NAND and NOR gates can be used asuniversal building blocks.

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COURSE-V

CBCS/SEMESTERSYSTEM B.Sc.PHYSICS
MODERN PHYSICS

Course Outcomes (Theory)

CO1: Develop an understanding on the concepts of Atomic and Modern Physics, basicelementary quantum mechanics and nuclear physics.

CO2: Develop critical understanding of concept of Matter waves and Uncertainty principle.

CO3: Get familiarized with the principles of quantum mechanics and the formulation ofSchrodinger wave equation and its applications.

CO4: Examine the basic properties of nuclei, characteristics of Nuclear forces, salientfeatures of Nuclear models and different nuclear radiation detectors.

CO5: Classify Elementary particles based on their mass, charge, spin, half life andinteraction.

CO6: Get familiarized with the nano materials, their unique properties and applications.

CO7: Increase the awareness and appreciation of Super conductors and their practical applications

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Practical Course II: MODERN PHYSICS

Course outcomes (Practicals):

- Measure charge of an electron ande/m value of an electron by Thomson method.
- Understand how the Planck's constant can be determined using Photocell and LEDs.
- Study the absorption of α-rays and β-rays, Range of β-particles and the characteristicsof GM counter.
- Determine the Energy gap of a semiconductor using thermistor and junction diode
- Understand the operation of PN junction diode, Zener diode and a transistor and theirV-I characteristics.
- Construct the basic logic gates, half adder and full adder and verify their truth tables.
- Further, the student will understand how NAND and NOR gates can be used asuniversal building blocks.

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Course 6C: APPLICATIONS OF ELECTRICITY & ELECTRONICS
Skill Enhancement Course (Elective)

Course Outcomes (Theory)

1. Identify various components present in Electricity& Electronics Laboratory.
2. Acquire a critical knowledge of each component and its utility (like resistors, Capacitors, inductors, power sources etc.).
3. Demonstrate skills of constructing simple electronic circuits consisting of basic circuit elements.
4. Understand the need & Functionality of various DC & AC Powersources.
5. Comprehend the design, applications and practices of various electrical & Electronicdevices and also their trouble shooting.

Practical Course :APPLICATIONS OF ELECTRICITY & ELECTRONICS

Course outcomes (Practicals):

1.List out, identify and handle various equipment in Electrical & Electronics laboratory.

2. Learn the procedures of designing simple electrical circuits.

3. Demonstrate skills on the utility of different electrical components and devices.

4. Acquire the skills regarding the operation, maintenance and troubleshooting of various Devices in the lab.

5. Understand the different applications of Electromagnetic induction.

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Course 7C: ELECTRONIC INSTRUMENTATION
Skill Enhancement Course (Elective)

CourseOutcomes (Theory)

1.Identify various components present in Electricity& Electronics Laboratory.

2. Acquire a critical knowledge of each component and its utility (like resistors, Capacitors, inductors, power sources etc.).

3. Demonstrate skills of constructing simple electronic circuits consisting of basic circuit elements.

4. Understand the need & Functionality of various DC & AC Power sources.

5. Comprehend the design, applications and practices of various electrical & Electronicdevices and also their trouble shooting.

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Practical Course :: ELECTRONIC INSTRUMENTATION

Course outcomes (Practicals):

1. List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory.
2. Learn the construction, operational principles of various instruments.
3. Demonstrate skills on handling, Maintenance & trouble shooting of different instruments used in the Labs.
4. Acquire skills in observing and measuring various electrical and electronic quantities.
5. Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc

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