

B.L.D.E.ASSOCIATION'S
S. B. ARTS AND K. C. P. SCIENCE COLLEGE VIJAYAPUR
DEPARTMENT OF PHYSICS & ELECTRONICS

Academic year: 2022-23

Subject: Physics

Program Outcomes

	Descriptions
PO1	Discipline knowledge: Knowledge of basics of science and ability to apply the understanding of fundamentals of major discipline in solving complex problems.
PO2	Communication Skills: Communicate effectively with the stake holders, write and comprehend project reports and documentation, deliver effective presentations, and give and receive clear instructions.
PO3	Critical Thinking, Reflective thinking, Analytical reasoning, Scientific reasoning
PO4	Problem Solving: Implement a solution process using first principles of science to solve problems related to respective discipline
PO5	Research related skills: Conduct Investigations of issues using research methods and research based discipline knowledge including design of experiments, data collection, interpretation and analysis to arrive at valid conclusions.
PO6	Team work/ Leadership readiness/ Qualities: Work effectively as an individual as a team member and as a leader in a multidisciplinary team.
PO7	Information/ Digital literacy/Modern Tool Usage: Identify, select and use a modern scientific, engineering and IT tool or technique for modeling, prediction, data analysis and solving problems in the areas of their discipline.
PO8	Environment and Society: Evaluate the impact of scientific solutions on society and environment and the need for sustainable solutions.
PO9	Ethical Awareness/Reasoning: Demonstrate professional ethics, responsibilities and norms in respective profession
PO10	Lifelong Learning: Engage in lifelong learning in the context of changing trends in respective discipline.
PO11	Multidisciplinary/Project Management and Finance: Apply the knowledge of scientific and technological principles to one's own work to manage projects in multidisciplinary settings
PO12	Design and Development of solutions: Design solutions for complex scientific problems and execute them by considering the environmental, societal and public safety aspects appropriately.

Course Outcomes

CLASS	PAPER	COURSE OUTCOMES	DESCREPTIONS
B. SC.I SEM (NEP DSC)	Mechanics and properties of matter	CO1	Estimate the possible error in measurement of a physical quantity , using its dimensional equations, the least counts of instruments used and by actual measurements in the appropriate system of units.
		CO2	Students will be able to explain gradient, divergence and curl in a physical phenomenon and write mathematical formula for the same.
		CO3	Students must identify and explain three examples for Divergence and three examples for Curls in real-world applications.
		CO4	Apply laws of conservation of momentum and associated energy along with laws to motion to the systems of linear/rotational motion to determine different parameters associated with physically rigid bodies.
		CO5	Students will describe how fictitious forces arise in a non-inertial frame, using this explain why a person sitting in a merry-go-round experiences an outward pull.
		CO6	Determine theoretically and experimentally the relation between three elastic constants.
		CO7	Apply the concept of surface tension and viscosity of liquid. Classify fluids based on the law of viscosity
		CO8	Students will be able draw Stress and Strain Curve for Steel, Rubber and Wood.
		CO9	Measure surface tension of water and other common liquids
		CO1	Students will learn, how to use Vernier caliper & screw gauge to calculate dimensional values of different solid materials.
		CO2	Practically learn & get the knowledge about S.I.M.
		CO3	Experimentally students will calculate the value of ' g ' at different places in the laboratory & discover that the value of ' g ' changes at each place by performing Bar pendulum & Flat spiral spring experiment.
		CO4	By performing the experiment on Stoke's law students will be able to find out the coefficient of viscosity of various liquids.

B. SC.I SEM (NEP DSC)	Theory based Practical's on Mechanics & properties of matter	CO5	Determine theoretically & experimentally the relation between three elastic constants
		CO1	Understand the need of energy conversion and the various methods of energy storage.
	Energy sources (OEC)	CO2	Explain the field applications of solar energy .
		CO3	Identify wind energy as alternate form of energy and to know how it can be tapped.
		CO4	Explain bio gas generation and its impact on environment.
		CO5	Understand the Geothermal and Tidal energy , its mechanism of production and its applications.
		CO6	Illustrate the concepts of Direct Energy Conversion Systems and their applications.

CLASS	PAPER	COURSE OUTCOMES	DESCREPTIONS
	Electricity & Magnetism	CO1	Give the applications of charge distribution and energy associated with a charge for various shapes of electrical conductors, using the principles of the different laws of Electrostatic field and potential.
		CO2	Explain the impact of polarization due to an electrical field on a dielectric material, and the different terms related to dielectrics and the relation between them.
		CO3	To obtain the impact of the electrical field in producing a magnetic field with resulting laws and applications.
		CO4	Define various terms associated with a magnetic material and the relation between them, and demonstrate the types of the magnetic material in terms of their respective BH curves.

B.SC.II SEM (NEP DSC)		CO5	Obtain Maxwell's equations in differential and integral forms of transverse electromagnetic waves based on Faraday's and Lenz's laws, along with their production.
		CO6	Obtain different quantities of resonance, power dissipation, quality factor and bandwidth for RL, RC, LCR series and parallel circuits, using basic laws of electrical circuits.
		CO7	Use Ballistic Galvanometer to obtain charge sensitivity and electromagnetic damping.
B.SC.II SEM (NEP DSC)	Theory based Practical's on Electricity & Magnetism	CO1	To understand the importance of Thevenin's theorem and Draw the Complex Network into a Thevenin's equivalent circuit.
		CO2	To understand the importance of Norton's theorem and Draw the Complex Network into a Norton's equivalent circuit.
		CO3	To study the charging and discharging of the capacitor through the given resistance
		CO4	To calibrate the Ammeters for the study of Helmholtz Galvanometer and study the deflections of the Galvanometer under the magnetic field.
		CO5	To study the noise reduction produced into De Sauty's AC Bridge and compare the capacitance of the given capacitors.
		CO6	Using Cathode Ray Oscilloscope, students will study the measurement of voltage, frequency and phase shift of different waves.
	Optical Instruments (OEC)	CO1	To learn about different telescopes used to see galaxies and their ranges.
		CO2	To observe the dispersion of light through prism.
		CO3	To observe rainbows and understand optics.
		CO4	To study the reflection and refraction of light, students can use various lenses and different medium.
		CO5	To study the age of the materials or heavenly bodies, carbon dating is very helpful for the students to know the age any of the heavenly bodies.

CLASS	PAPER	COURSE OUTCOMES	DESCREPTIONS
B. SC. III SEM DSC (NEP)	Wavemotion and Optics	CO1	Identify different types of waves by looking into their characteristics .
		CO2	Formulate a wave equation and obtain the expression for different parameters associated with waves.
		CO3	Give an analytical treatment of resonance in case of open and closed pipes in general and Helmholtz resonators in particular.
		CO4	Describe the different parameters affect the acoustics in a building, measure it and control it .
		CO5	Explain the polarization of light and obtain how the polarization occurs due to quarter wave plate, half wave plate and through the optical activity of a medium.
B. SC. III SEM DSC (NEP)	Theory based Practical's on Wavemotion and Optics	CO1	Explain how Newton's rings are obtained and discuss how the wavelength of light is determined using this experiment.
		CO2	Discuss the formation of different lissajous figures under different conditions of amplitude and frequency when they superimposed perpendicularly.
		CO3	Obtain experimentally frequency of AC using Sonometer.
		CO4	How diffraction due to grating.
		CO5	Determination of frequency of tuning fork by transverse vibration using Melde's experiment.
B. SC. III SEM DSC (NEP)	Climate Science (OEC)	CO1	Understand the physical basics of the natural greenhouse effect, including the meaning of the term radiative forcing.
		CO2	Know the impacts that climate change is having on the natural environment.
		CO3	Learn to determine atmospheric humidity using wet bulb and dry bulb thermometers.

		CO4	To understand the process of cloud seeding.
		CO5	Know some of the global impacts of sea level rise.

CLASS	PAPER	COURSE OUTCOMES	DESCREPTIONS
B.SC IV SEM DSC (NEP)	Thermal physics and Electronics.	CO1	Apply the laws of thermodynamics and analyze the thermal system.
		CO2	Apply the laws of kinetic theory and Radiation laws to the ideal and practical thermodynamic systems through derived thermodynamic relations.
		CO3	Use the concepts of semiconductors to describe different semiconductor devices such as diode, transistors, bjt, fet etc. and explain their functioning.
		CO4	Explain the functioning of Op-amps and use them as the building blocks of logic gates.
		CO5	Give the use of logic gates using different theorems of Boolean algebra followed by logic circuits.
		CO6	Explain the polarization of light and how the polarization occurs due to quarter wave plates, half wave plates and the optical activity of a medium.
		CO2	To draw the characteristics of zener diode and study and its use as a voltage regulator.
		CO3	Realization of basic gates using NAND gate and using IC7400.
		CO4	Verification of Boolean algebra using NAND gate and IC7400.

		CO5	Study the frequency response of CE amplifier.
B. SC. V SEM (CBCS)	WITH EFFECT FROM (2019-20) ONWARDS Paper-I Physics 5.1: Mathematical Physics I, Nuclear and particle Physics and classical mechanics	CO1	Apply Mathematical ideas and models to problems.
		CO2	Apply Mathematic problems and solution in aspects of science and technology.
		CO3	Understand about the power full nuclear apparatus applications.
		CO4	Formulate the simple equations regarding nuclear reactions.
		CO5	Use of nuclear energy is useful purpose.
		CO6	Apply the conservation laws in many physical phenomenons.
B. SC. V SEM (CBCS)	PHYSICS 5.1: Lab V Theory based Practical's on Mathematical Physics I, Nuclear and particle Physics and classical mechanics PHYDSCP5.1	CO1	To determine the plate and operating voltage of GM counter.
		CO2	To determine the efficiency of GM counter.
		CO3	TO determine the threshold voltage of GM counter
		CO4	Study the astable multivibrator.

B. SC. VI SEM (CBCS)	WITH EFFECT FROM 2019-20 ONWARDS Paper-I Physics 6.1 Mathematical Physics-II, Atomic Molecular and Optical Physics and Atmospheric Physics PHYDECT6.1	CO1	To study the second order linear differential equations and their importance.
		CO2	To understand the concept of Bohr's theory of hydrogen atom.
		CO3	To learn about pure rotational spectrum of diatomic molecule.
		CO4	To study the earth atmosphere system.
		CO5	To understand the green house effect.
B. SC. VI SEM (CBCS)	Physics 6.1 Lab - VII Theory based Practical's on Mathematical Physics-II, Atomic Molecular and Optical Physics and Atmospheric Physics PHYDSCP6.1	CO1	To verify the Beer's law.
		CO2	Setup the photovoltaic cell characteristics.
		CO3	To study the photoconductive cell characteristics.
		CO4	To understand how to calculate unknown wavelength using grating element.
		CO1	To Study quantum mechanics.

B. SC. VI SEM (CBCS)	(WITH EFFECT FROM 2019-20 ONWARDS)	Paper-II Quantum Mechanics-II, Condensed Matter Physics- I and nanomaterials	CO2	To Discuss about crystal structures.
			CO3	Explain about free electron theory of metals.
			CO4	Study the dielectric materials.
			CO5	Discuss about Nanomaterials.
B. SC. VI SEM (CBCS)	Physics 6.2 Lab - VIII Theory based Practical's on Quantum Mechanics-II, Condensed Matter Physics I and nanomaterials PHYDSCP6.2 A		CO1	Study the Fermi energy of Copper wire.
			CO2	Explain the energy gap of thermistor.
			CO3	Study the LED characteristics.
			CO4	Study the Dielectric constant of solids.
			CO5	Discuss the Planks constant using LED.



HOD

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