Shri Guru Teg bahadur Ji Government College, Taraori(Karnal)

Department: PHYSICS **Class:** 2nd SEM

Subject: PHYSICS **Lesson Plan**

Month		
Feb	Week 1	
	Week 2	Gradient & its physical Significance, Line, Surface & Volume integrals, Divergence & Curl & their physical significance.
	Week 3	Gauss's divergence Thm, Stoke's Thm, Conservative nature of electrostatic field. Electrostatic potential.
	Week 4	Derivation of electric field from potential, Electric flux, Gauss's law, Differential form of Gauss law & applications.
March	Week 1	Biot-Savrat law and its applications – Straight wire, circular loop, current loop as magnetic dipole, Ampere's circuital law & applications.
	Week 2	Solenoid & Toroid, Properties of B: Curl & divergence. Force on a dipole in external field, Electric currents in atoms, Electron spin and magnetic moment.
	Week 3	Types of magnetic materials, Magnetization vector, Magnetic intensity, Susceptibility, permeability.
	Week 4	Relation between B, H and M. Theory of dia, para and ferromagnetism, B-H Curve, Hysteresis loss.
April	Week 1	Electromagnetic Induction, Faraday's laws and Lenz's law, Self Inductance, mutual Inductance, Energy stored in magnetic field, Maxwell's equations
	Week 2	Displacement current, Maxwell's equations in differential and integral form and their physical significance.
	Week 3	EM waves, Transverse nature of EM waves, Poynting Vector, Poynting Thm, propagation of EM waves in free space, dielectrics
	Week 4	Electric current & current density, Electrical Conductivity & ohm's law, Kirchoff's law for DC,
May	Week 1	Thevenin's Thm, Norton Thm, superposition Thm
	Week 2	Resonance circuit, Analysis of RL, RC and LC circuits, Series & parallel resonance circuits:
	Week 3	I) Resonance II) Power dissipation III) Quality factor IV) Band width
	Week 4	

Rajvir

(Dr Rajvir)

Shri Guru Teg bahadur Ji Government College, Taraori(Karnal)

Department: PHYSICS **Class:** 4th SEM

Subject: PHYSICS **Lesson Plan**

Month		
Feb	Week 1	
	Week 2	Young's double Slit experiment, Coherent Sources, Conditions of interference, Fresnel's biprism.
	Week 3	Application of biprism to determine Wavelength and thickness of mica sheet, Phase change on reflection. Parallel thin films.
	Week 4	Production of Colors in thin films, Classification of fringes, Interference due to transmitted light and reflected light, wedge shaped film and Newton's rings.
March	Week 1	Huygen-Fresnel's theory, rectilinear propagation of light, Diffraction at a Straight edge, rectangular slit and circular aperature.
	Week 2	Diffraction due to narrow wire, Simple Slit diffraction
	Week 3	double Slit diffraction, plane transmission grating
	Week 4	limit of resolution, Rayleigh's criterion, resolving power of telescope, dispersive power of grating
April	Week 1	Polarization by reflection, refraction and scattering, Malus law
	Week 2	Double refraction, Huygen's wave theory of double refraction
	Week 3	Analysis of polarized light, Nicol prism, QWP & HWP
	Week 4	Production and detection of plane polarized, circularly polarized, elliptically polarized light, optical activity.
May	Week 1	Specific rotation & Polarimeters - half Shade & biquartz
	Week 2	Basic Concept of absorption, emission, amplification of radiation, Population inversion, Main Components of laser
	Week 3	Characteristics of laser, He-Ne and Ruby laser, optical fiber, light propagation through fiber, acceptance angle, NA
	Week 4	Single mode & multimode fibers, Advantage & disadvantage, Application of fiber, fiber optic sensors

(Dr Rajni Kaur)

Shri Guru Teg bahadur Ji Government College, Taraori(Karnal)

Department: PHYSICS **Class: BSc 6th SEM**

Subject: Solid State and Nano Physics **Lesson Plan**

Month		
JANUARY	Week 1	Crystalline and glassy forms, liquid crystals, crystal structure, periodicity, lattice and basis
	Week 2	crystal translational vectors. Unit cell and Primitive Cell, symmetry operations for a two andf three dimensional crystal
	Week 3	Bravais lattices in two and three dimensions. Crystal planes and Miller indices, Interplaner spacing
	Week 4	Crystal structures of Zinc Sulphide, Sodium Chloride and Diamond, Class Test
FEBRUARY	Week 1	X-ray diffraction, Bragg's Law and experimental X-ray diffraction methods,
	Week 2	K-space and reciprocal lattice and its requirement and physical significance
	Week 3	reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, b.c.c. and f.c.c., Class Test
	Week 4	Experimental survey of superconductivity, Super conducting systems
MARCH	Week 1	High Tc Super conductors, Isotopic Effect, Critical Magnetic Field, Meissner Effect,
	Week 2	London equations and explanation of superconductivity, Type I and Type II Superconductors
	Week 3	BCS Theory of Superconductivity, Flux quantization,
	Week 4	AC and DC Josephson Effect, Practical Applications of superconductivity, Class Test
APRIL	Week 1	Length scale, Importance of Nano-scale and technology, History of Nano-technology
	Week 2	Benefits and challenges in molecular manufacturing. Molecular assembler concept, Understanding advanced capabilities
	Week 3	Vision and objective of Nano-technology, Nanotechnology in different fields
	Week 4	Automobile, Electronics, Nano-biotechnology, Materials, Medicine, Class Test

(Dr Ranjan Kaur)

Shri Guru Teg bahadur Ji Government College, Taraori(Karnal)

Department: PHYSICS **Class: BSc 6th SEM**

Subject: Atomic and Molecular Spectroscopy **Lesson Plan**

Month		
JANUARY	Week 1	Early observations, emission and absorption spectra, spectrum of Hydrogen, Bohr atomic model, spectra of Hydrogen atom
	Week 2	explanation of spectral series in Hydrogen atom, spectral series in absorption spectra, correction of finite nuclear mass, variation in Rydberg constant due to finite mass
	Week 3	short comings of Bohr's theory, Wilson sommerfeld quantization rule, de-Broglie interpretation of Bohr quantization law, Bohr's correspondence principle, Sommerfeld's extension of Bohr's model, Sommerfeld model
	Week 4	Short comings of Bohr-Sommerfeld theory, Vector atom model; space quantization, electron spin, coupling of orbital and spin angular momentum, spectroscopic terms and their notation, quantum numbers associated with vector atom model,transition probability and selection rules, Class Test
FEBRUARY	Week 1	Orbital magnetic dipole moment, behavior of magnetic dipole in external magnetic field; Larmors' precession and theorem,
	Week 2	Penetrating and Non-penetrating orbits, Quantum defect, spin orbit interaction energy of the single valance electron, spin orbit interaction for penetrating and non-penetrating orbits. quantum mechanical relativity correction,
	Week 3	Hydrogen fine spectra, Main features of Alkali Spectra and their theoretical interpretation, term series and limits, Rydeburg-Ritz combination principle,
	Week 4	Absorption spectra of Alkali atoms, Intensity rules for doublets, comparison of Alkali spectra and Hydrogen spectrum, Class Test
MARCH	Week 1	Application of spectra. Coupling Schemes-LS or Russell – Saunders Coupling Scheme and JJ coupling scheme, Interaction energy in L-S coupling
	Week 2	Lande interval rule, Pauli principal and periodic classification of the elements. Interaction energy in JJ Coupling
	Week 3	equivalent and non-equivalent electrons, Two valance electron system-spectral terms of non-equivalent and equivalent electrons
	Week 4	comparison of spectral terms in L-S And J-J coupling. Hyperfine structure of spectral lines and its origin; isotope effect, nuclear spin, Class Test
APRIL	Week 1	Normal and anomalous Zeeman Effect, Experimental set-up for studying Zeeman effect
	Week 2	Classical and Quantum mechanical explanation of normal Zeeman effect, Explanation of anomalous Zeeman effect(Lande g-factor),
	Week 3	Zeeman pattern of D1 and D2 lines of Na-atom, Paschen-Back effect of a single valence electron system
	Week 4	Weak field Stark effect of Hydrogen atom, Class Test