

**Government College, Chhachhrauli**

**Summary of Lesson Plan**

Name of Teacher: **Dr. Shruti Bhardwaj**

Academic Session : **2025-26**

Class : **B.Sc.**

Semester : **6<sup>th</sup>**

Subject :

<b>Unit</b>	<b>Topic/Chapters to be covered</b>	<b>Duration</b>	<b>Assignment and Tests</b>
1.	<b>SEMI-CONDUCTOR DIODES:</b> Serniconductors: Intrinsic and Extrinsic Semiconductor.	<b>12-01-26</b> <b>20-01-26</b>	
1.	P-N Junction diode and its V-I characteristics, Ideal Diode, Zener and Avalanche Breakdown.	<b>21-01-26</b> <b>31-01-26</b>	
1.	Zener Diode and its application as Voltage regulator. Photo-Diode. Light Emitting Diode, Solar Cell.	<b>01-02-26</b> <b>08-02-26</b>	
1.	P-N Junction as Half Wave and Full Wave Rectifiers: Efficiency and Ripple Factor, Comparison of Rectifiers,	<b>09-02-26</b> <b>15-02-26</b>	
1.	Clipping and Clamping circuits, Voltage Multiplier Circuits; Doubler and Tripler.	<b>16-02-26</b> <b>22-02-26</b>	
2.	<b>THE BIPOLAR TRANSISTOR:</b> The Bipolar Junction Transistor, Transistor Action and Working (PNP and NPN transistor), Transistor Circuit configurations: Common Base (CB),	<b>23-02-26</b> <b>28-02-26</b>	Test
	<b>HOLI Break</b>	<b>01-03-26</b> <b>08-03-26</b>	

2.	Common Emitter (CE) and Common Collector (CC) configurations, Current Amplification Factors ( $\alpha$ , $\beta$ and $y$ ) and Relationship between them, Comparison of characteristics of Transistor in different configurations.	<b>09-03-26</b> <b>15-03-26</b>	
2.	<b>Amplifiers:</b> CB, CC and CE amplifiers, Transistor Biasing: selection of operating point, Load line analysis and operating point. Methods of Transistor biasing and stabilization (Fixed Base Bias, Bias with emitter resistor and voltage divider circuit).	<b>16-03-26</b> <b>22-03-26</b>	
3.	<b>MULTISTAGE TRANSISTOR AMPLIFIERS:</b> RC Coupled amplifier (two-stage, concept of bandwidth, no derivation), Classification of amplifiers Class A, B, AB and C amplifiers.	<b>23-02-26</b> <b>29-03-26</b>	Assignment
3.	<b>Feedback in Amplifiers:</b> Principle, Types of feedback, voltage gain, Advantages of negative feedback: Stabilization of gain, reduction in frequency distortion, reduction in non-linear distortion.	<b>30-03-26</b> <b>05-04-26</b>	
3.	reduction in noise. Effect of negative feedback on Input impedance, output impedance and bandwidth Emitter follower circuit.	<b>06-04-26</b> <b>12-04-26</b>	
4.	<b>OSCILLATORS:</b> Oscillations, Damped and Undamped Oscillations, Oscillatory circuit. Principle of Oscillation.	<b>13-04-26</b> <b>19-04-26</b>	
4.	Condition for self-sustained oscillation: Barkhausen Criteria for sustained oscillations. Essentials of Transistor oscillator.	<b>20-04-26</b> <b>26-04-26</b>	
4.	Selection of an Oscillator, Classification of oscillators, LC oscillators; Tuned collector, Tuned Base, Hartley Oscillator, Colpitt's Oscillator, RC oscillators: Phase Shift and Wein Bridge Oscillator.	<b>27-04-26</b> <b>05-05-26</b>	

**Government College, Chhachhrauli**

**Summary of Lesson Plan**

**Name of Teacher: Dr. Shruti Bhardwaj**

**Academic Session : 2025-26**

**Class : B.Sc.**

**Semester : 2<sup>nd</sup>**

**Subject : Electricity, Magnetism and EM Theory**

<b>Unit</b>	<b>Topic/Chapters to be covered</b>	<b>Duration</b>	<b>Assignment and Tests</b>
4.	<b>Alternating Current Circuits and Network Theorems:</b> Electric current and current density, Electrical-conductivity and Ohm's law (Review).	<b>12-01-26 20-01-26</b>	
4.	<b>Alternating Current Circuits:</b> A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit: Resonance, Power Dissipation, Quality Factor and Band Width, Parallel LCR Circuit.	<b>21-01-26 31-01-26</b>	
4.	Kirchhof's laws for D.C. networks Network Theorems: Thevenin's Theorem, Norton theorem. Superposition Theorem.	<b>01-02-26 08-02-26</b>	
3.	<b>Time Varying Electromagnetic Fields:</b> Electromagnetic induction Faraday's laws of induction and Lenz's Law, Self-inductance, Mutual inductance, Energy stored in a Magnetic field, Derivation of Maxwell's equations, Displacement current, Maxwell's equations in differential and integral form and their physical significance.	<b>09-02-26 15-02-26</b>	
3.	<b>Electromagnetic Waves:</b> Electromagnetic waves, Transverse nature of electromagnetic wave, energy transported by electromagnetic waves.	<b>16-02-26 22-02-26</b>	

3.	Poynting vector, Poynting's theorem. Propagation of Plane electromagnetic waves in free space & Dielectrics.	<b>23-02-26</b> <b>28-02-26</b>	Test
	<b>HOLI Break</b>	<b>01-03-26</b> <b>08-03-26</b>	
2.	<b>Magnetic Field:</b> Biot-Savart law and its simple applications: straight wire and circular loop, Current Loop as a Magnetic Dipole and its Dipole Moment, Ampere's Circuital Law and its applications to (1) Solenoid and (2) Toroid. properties of B: curl and divergence.	<b>09-03-26</b> <b>15-03-26</b>	
2.	<b>Magnetic Properties of Matter:</b> Force on a dipole in an external field, Electric currents in Atoms, Electron spin and Magnetic moment, types of magnetic materials, Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability,	<b>16-03-26</b> <b>22-03-26</b>	
2.	Relation between B, H and M, Electronic theory of dia and paramagnetism. Domain theory of ferromagnetism (Langevin's theory), Cycle of Magnetization-B-H curve and hysteresis loop: Energy dissipation. Hysteresis loss and importance of Hysteresis Curve	<b>23-02-26</b> <b>29-03-26</b>	Assignment
1.	<b>Vector Background and Electric Field:</b> Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field.	<b>30-03-26</b> <b>05-04-26</b>	
1.	Divergence and curl of a vector and their physical significance, Gauss's divergence theorem.	<b>06-04-26</b> <b>12-04-26</b>	
1.	Stoke's theorem. Conservative nature of Electrostatic Field, Electrostatic Potential, Potential as line integral of field.	<b>13-04-26</b> <b>19-04-26</b>	

1.	potential difference Derivation of electric field E from potential as gradient. Derivation of Laplace and Poisson equations.	<b>20-04-26</b> <b>26-04-26</b>	
1.	Electric flux, Gauss's Law. Differential form of Gauss's law and applications of Gauss's law. Mechanical force of charged surface. Energy per unit volume.	<b>27-04-26</b> <b>05-05-26</b>	

**Government College, Chhachhrauli**

**Summary of Lesson Plan**

**Name of Teacher: Dr. Sandeep Kumar**

**Academic Session : 2025-26**

**Class : B.Sc.**

**Semester : 4<sup>th</sup>**

**Subject : Wave And Optics**

<b>Unit</b>	<b>Topic/Chapters to be covered</b>	<b>Duration</b>	<b>Assignment and Tests</b>
1.	<b>Interference by Division of wavefront:</b> Young's experiment, phase difference.	<b>12-01-26 20-01-26</b>	
1.	Fresnel's biprism and its applications to determine the wavelength of sodium light and thickness of a mica sheet. phase change on reflection.	<b>21-01-26 31-01-26</b>	
1.	<b>Interference by Division of Amplitude:</b> Plane parallel thin film, production of colors in thin films, classification of fringes in films.	<b>01-02-26 08-02-26</b>	
1.	Interference due to transmitted light and reflected light, wedge shaped film, Newton's rings.	<b>09-02-26 15-02-26</b>	
2.	<b>Fresnel's diffraction:</b> Huygen-Fresnel's theory, Fresnel's assumptions, rectilinear propagation of light, diffraction at a straight edge, rectangular slit and diffractions circular aperture Diffraction due to a narrow slit, diffraction due to a narrow wire.	<b>16-02-26 22-02-26</b>	
2.	<b>Fraunhofer diffraction:</b> Single slit diffraction, double slit diffraction, plane transmission grating spectrum,	<b>23-02-26 28-02-26</b>	Test
	HOLI Break	<b>01-03-26 08-03-26</b>	

2.	dispersive power of grating, limit of resolution, resolving power of telescope and a grating Rayleigh's criterion,	<b>09-03-26</b> <b>15-03-26</b>	
3.	<b>Polarization:</b> Polarization by reflection refraction and scattering, Malus Law, Phenome of double refraction, Huygen's wave theory of double refraction (Normal and lig incidence), Analysis of polarized Light. Nicol prism,	<b>16-03-26</b> <b>22-03-26</b>	
3.	Quarter wave plate and half plate, production and detection of (i) Plane polarized light (ii) Circularly polarized and (iii) Elliptically polarized light.	<b>23-02-26</b> <b>29-03-26</b>	Assignment
4.	Optical activity, Fresnel's theory of optical m Specific rotation. Polarimeters (half shade and Biquartz).	<b>30-03-26</b> <b>05-04-26</b>	
4.	<b>Lasers:</b> Basic concept of absorption and emission of radiations, amplificati population inversion, Main components of lasers: (i) Active Medium (ii) P (iii) Optical Resonator, Properties of laser beam; Monochromaticity, Directionality, Intensity.	<b>06-04-26</b> <b>12-04-26</b>	
4.	Coherence (Spatial & Temporal coherence); Metastable state, Excitation mechanism and Types of Lasers (He-Ne Laser & Ruby Laser), Applications of Laser.	<b>13-04-26</b> <b>19-04-26</b>	
4.	<b>Fibre Optics:</b> Optical fibres and their properties, Principal of light propagation through a optical fibre, Acceptance angle and numerical aperture.	<b>20-04-26</b> <b>26-04-26</b>	
4.	Types of optical fibles: single mode and multimode fibres, Advantages and Disadvantages of optical fibres,Application of optical fibres, Fibre optic sensors, Fibre Bragg Grating..	<b>27-04-26</b> <b>05-05-26</b>	