# BISHOP SCOTT BOYS' SCHOOL

C = Qurriculum
D = Development &
L = Learning
D = Development







## **BISHOP SCOTT BOYS' SCHOOL**

#### STUDENT CURRICULUM MANUAL

## Subject : Physics

### Class: XII

Academic Plan : 2025 - 26

Month	Course Description	Learning Outcome	Activity	No. of	Portion for PT & TERM
1,1011011				Periods	Assessment
April	Electrostatics Chapter - 1 *Electric charge and field (Electric charge ,conservation of charge , coulomb's law, force between multiple charges, superposition principal and continuous charge distribution. Electric field , Electric field due to a point charge ,Electric field lines, Electric dipole , Electric field lines, Electric dipole , Electric field due to dipole ,Torque on a dipole in uniform electric field ,Electric flux , statement of Gauss theorem and its application to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell.	• a learning outcomes presentation on electrostatics good typically include the ability to define an explain basic concepts like electric charge coulomb's law electric field electric potential and Gauss's law calculate the electric field and potential due to various charge distribution understanding the concept of electric field lines and equipotential surface, apply the concept to solve problems related to static charge and their interactions and discuss real world applications of electrostatic like capacitors and photo copies	*To determine the resistance per cm. of a given wire by plotting a graph for potential difference versus current	10 periods	R



Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
May	Current electricity Chapter - 3 *Electric current flow of electric charge in a metallic conductor Drift velocity, mobility and relations with electric current. *Ohm's law V- I characteristic linear and non linear electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance internal resistance of a cell. *potential difference and EMF of a cell combination of cells in series and in parallel. Kirchhoff's rule wheat-stone bridge.	• After studying current electricity a learner should be able to define and understand the concept of electric current potential difference resistance and their relationship as described by ohm's law identify and analyse different type of electric circuit series and parallel. Calculate current, voltage and resistance in circuit using Ohm's law and explain the factor affecting resistance in conductor difference between direct current and alternating current and understand the basic principle of electrical power and energy uses	*To verify the laws of combination series and parallel of resistance using a meter- bridge.	12 periods	

Magnetic effects of current and Magnetism• When studying the magnetic effect of current learning outcomes are*To determine resistance of a galvanometer by half15	Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
June       *Concept of magnetic field Oersted experiment Biot-Savert law and its application to current carrying circular loop and Ampere's law and its application, To infinitely long straight wire , solenoid( only qualitative treatment)       understanding the electric current produces a magnetic field around a current carrying wire explain the concept of an electromagnet apply the right hand rule to determine magnetic field direction and recognizing practical application of ampere torque experienced by a circular loop in uniform magnetic field       understanding the electromagnet apply the right hand rule to determine magnetic field direction and recognizing practical application of electromagnet apply the right hand rule to determine magnetic field direction and recognizing practical application of application of an electromagnet apply the right hand rule to determine magnetic field direction and recognizing practical application of torque experienced by a circular loop in uniform magnetic field       mores and generators, while also being able to calculate the strength of the magnetic field using relevant formula like amperes law.       method and to ind its figure of merit.         * Moving coil galvanometer it's       * Moving coil galvanometer it's       method and to ind identifying the direction and the intervent of torque experiment direction and recognizing practical application of the magnetic field using relevant formula like amperes law.       is figure of merit.	June	Magnetic effects of current and Magnetism Chapter - 4 *Concept of magnetic field Oersted experiment Biot-Savert law and its application to current carrying circular loop and Ampere's law and its application, To infinitely long straight wire , solenoid( only qualitative treatment) *Force on a current carrying conductor in a uniform magnetic field, force between two parallel current carrying conductor definition of ampere torque experienced by a circular loop in uniform magnetic field current loop in uniform magnetic field *Current loop as a magnetic dipole. And it's magnetic dipole moment * Moving coil galvanometer it's	• When studying the magnetic effect of current learning outcomes are understanding the electric current produces a magnetic field identifying the direction of the magnetic field around a current carrying wire explain the concept of an electromagnet apply the right hand rule to determine magnetic field direction and recognizing practical application of electromagnetic light motors and generators, while also being able to calculate the strength of the magnetic field using relevant formula like amperes law.	*To determine resistance of a galvanometer by half deflection method and to find its figure of merit.	15 periods	

	conversion to ammeter and				
	voltmeter.				
Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
	Magnetism and Matter	• Understand what			
	Chapter - 5	magnetic is identify the properties of magnet		E	PT <b>-</b> 1
	*Bar magnet, bar magnet equivalent solenoid, magnetic	d <mark>ifferentia</mark> te between ma <mark>gnetic</mark> poles and		/ Periods	Electrostatic ( chapter – 1&2)
	field intensity due to a	expl <mark>ain ho</mark> w like pole			*Current electricity ( chapter 3)
	magnetic dipole (qualitative treatment only).	repels <mark>and unlike poles</mark> attract <mark>desc</mark> ribe what a			* Magnetic effect of current
July		magne <mark>tic f</mark> ield is visualize			(chapter 4)
	* l'orque on a magnetic dipole,	it during field lines and			
	magnetic field qualitative	analyze the earth			
	treatment only. Magnetic field	significance describe what			
	lines.	a magnetic field is			
	*Magnetic properties of materials para , dia and Ferro magnetic substance with examples.	Categorised material as ferromagnetic, paramagnetic or diamagnetic understanding how they are magnetic poles align	P SCOT		R
	*Magnetization of materials	within a magnetic field			
	magnetic properties	interior of magnetic field			
	magnetic properties				

Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
July	Electromagnetic induction Chapter - 6 *Electromagnetic inductions ,Faraday law, induced EMF and current, Lenz's law, self inductance and mutual inductance.	<ul> <li>Understanding the concept of changing magnetic field, induced electromotive force in a circuit, applying</li> <li>Faraday law to calculate the induced EMF. Lenz's law to determine the direction of the induced current</li> <li>recognising the application of electromagnetic induction in device like</li> <li>generator and transformer</li> <li>and being able to analyse</li> <li>the relationship between</li> <li>magnetic flux induces</li> <li>voltage in different</li> <li>scenarios.</li> </ul>	P Scon	10 periods	R

	Alternating Current	• Understanding the concept			
		of AC as a current that			
	Chapter 7	periodically reverses			
	*Alternating current peak and	direction differentiating it			
	RMS value of alternating	from direct current,		10	
	current /voltage reactance and	defining key AC		periods	
	impedance. **LCR	parameters like frequency,		-	
	series circuit, resonance ,	peak voltage, RMS value			
	power in AC circuit ,power	an <mark>d phase an</mark> gle explaining			
	factor, wattless current, AC	the behaviour of AC circuit		1	
	generator , transformer.	with resistor capacitors and			
	-	inductors calculating power			
		in AC circuits and			
		recognis <mark>ing</mark> the advantages			
		of AC fo <mark>r po</mark> wer			
		transmission due to the			
		ability to easy transform			
		voltag <mark>e leve</mark> ls using			
		Transfo <mark>rme</mark> rs			
Month	Course Description	Learning Outcome	Activity	No. of	Portion for PT & TERM Assessment
	1			Periods	
		• Understanding the			R
		fundamental concept of		7	
	Electromagnetic waves	electromagnetic wave as a			
	Chapter – 8	self propagating wave		4	
		generated by oscillating		periods	
August	*Basic idea of displacement	electric and magnetic field,			
	current, electromagnetic waves	identifying the different			
	their characteristic their	components of the			
	transverse nature qualitative	electromagnetic spectrum			
	Idea only, electromagnetic	based on wavelength and			

spectrum (radio wave	frequency explaining the		
microwave infrared visible	relationship between		
ultraviolet x-ray Gamma rays)	wavelength frequency and		
including elementary facts	energy applying knowledge		
about their uses	of electromagnetic waves to		
	real world applications like		
	radio communications light		
	microwave and medical		
	imaging etc		

Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
August	Ray optics and optical instruments Chapter – 9 *Reflection , spherical mirror formula, refraction of light ,total internal reflection ,and optical fibres refraction at a spherical surface ,lenses thin lens formula, lens maker formula, magnification power of lens, combination of thin lens in contact, refraction of	<ul> <li>Learning outcomes of optical includes the ability to explain the behaviour of light includes reflection, refraction, interference and diffraction. Apply these concept to analyse optical system like lenses mirrors and prism understanding the construction and function of common optical instruments such as microscope telescope due to the fractions and</li> </ul>	*To find the value of v for different value of u in case of a concave mirror and to find the focal length *2 to find the focal length of a convex mirror using a convex lens	15 periods	R

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Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
September	Wave optics Chapter – 10 Wave Front and Hygiene's principal reflection and refraction of plane wave at a plane surface using wave fronts proof of laws of reflection and refraction using Hygiene's , interference young double slit experiment and	• Able to explain the wave nature of light apply Hygiene's principle understanding the light behave as electromagnetic wave with property like wavelength, frequency , amplitude and uses this concept to explain the various optical phenomenon like interference and diffraction	*To find the focal length of a convex lens by plotting graph between u and v or between 1/u and 1/v	10 periods	Half yearly exam Chapter - 1 Chapter - 2 Chapter - 3 Chapter - 4 Chapter - 5 Chapter - 6

expression for fringe width		Chapter - 7
( no derivation find		
expression only)coherent		Chapter - 8
sources and sustained		
interference of light,		
diffraction due to a single		
slit, width of Central		
Maxima (treatment only)		

Month	Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
October	Dual nature of matter and Radiation Chapter11 *Dual nature of radiation, photoelectric effect heartz and Lenard observation Einstein photoelectric effect , particle nature of light ,experimental	<ul> <li>Understanding the concept of web particles to LED explain how both</li> <li>light and metal can exhibit</li> <li>characteristic of both wave and particles depending</li> <li>on the situation including</li> <li>the idea of quantum as a</li> <li>discrete packet of energy</li> <li>calculate the wavelength</li> <li>associated with a moving</li> </ul>	*To find the focal length of a concave lens using a convex lens	8 periods	R

study of photoelectric effect,	partly based on its			
matter waves nature of particle	momentum and			
De Broglie relation	understanding the			
	implication of this			
	wavelength for different			
	type of particles describe			
	in the photoelectric effect.			
Course Description	Learning Outcome	Activity	No. of Periods	Portion for PT & TERM Assessment
_	Course Description	Study of photocreteric circle;       party cases of not         matter waves nature of particle       momentum and         De Broglie relation       understanding the         implication of this       wavelength for different         type of particles describe       in the photoelectric effect.         Course Description       Learning Outcome	Matter waves nature of particle       momentum and         De Broglie relation       understanding the         implication of this       wavelength for different         type of particles describe       in the photoelectric effect.         Course Description       Learning Outcome       Activity	addy of photocetaric entrols         matter waves nature of particle         De Broglie relation         momentum and understanding the implication of this wavelength for different type of particles describe in the photoelectric effect.         Course Description       Learning Outcome       Activity       No. of Periods

October	Atoms Chapter – 12 Alpha particle scattering experiment Rutherford model of atom Bohr's model of hydrogen atom expression for radius of nth possible orbit ,velocity and energy of electron in nth orbit hydrogen like spectra qualitative treatment only	Understanding that atoms are the basic building blocks of matter identifying the three subatomic particles protons neutrons and electrons recognising how the number of protons determines and element explaining the structure of an atom with its nucleus containing protons and neutrons and being able to interpret information about 8 arms from the periodic table including atomic number.				

Month	Course Description	Learning Outcome	Activity	No. of	Portion for PT & TERM Assessment

				Periods	
November	Nuclei Chapter 13 *Composition and size of nucleus, nuclear forces ,mass energy relation, mass defect , binding energy per nucleon and its variation with mass number, Nuclear fission, nuclear fusion.	• Understanding the composition and structure of atomic nuclei explaining the forces holding them together identifying different types of nuclear reactions like fission and fusion calculating nuclear binding energy.		7 periods	PT - 2 Chapter - 9 Chapter - 10 Chapter - 11 Chapter - 12 Chapter - 13
November	<ul> <li>Semiconductor electronic materials devices and simple circuits</li> <li>Chapter - 14</li> <li>Energy band in conductor semiconductors and insulator, (qualitative Idea only) intrinsic and extrinsic , p and n type, P-N junction semi conductor diode.</li> <li>I - V characteristic in forward and reverse bias application of junction diode , diode as a rectifier.</li> </ul>	• Refers to study of how semiconductor material like silicon and germanium can be used to create electronic components like diodes and transistor which forms the basis for a building basic electrical circuit by manipulating their electrical property through doping and junction formations.	P SCON	10 Periods	R