Academic Calendar (2018-19)
of
Physics (PHSG)

Academic Calendar (2018-19) prepared and adhered to:

Department of physics							
Subject: PHSG							
Month: July 2018-May 2019					**Year-2018-2019**		
Sl No	**Hons/ Gen**	Paper	Group	Topic	No. of Lecture	Name of the Lecture	Class Taken
1.	**Gen**	PHSGCOR 01T	Mechanics	Mechanics			
	1st sem			**Mathematical Methods**	3	Vectors : vector algebra, Scalar and vector products.	3
					1	Derivatives of a vector with respect to a parameter.	1
					1	Class test	1
					2	Ordinary Differential Equations: 1st order homogeneous differential equations	2
					2	2nd order homogeneous and In homogeneous differential equations with constant coefficients.	2
					1	Class test	1
				Particle Dynamics	1	Laws of Motion: Frames of reference.	1
					2	Newton's Laws of motion. Dynamics of a system of particles	2
						Centre of Mass	
					1	Class Test	1
					4	Momentum and Energy: Conservation of momentum, Work and energy	3
					3	Conservation of energy. Motion of rockets.	3
					1	Class Test	1
					3	Rotational Motion: Angular velocity and angular momentum	3
					2	Torque. Conservation of angular momentum	2
					1	Class Test	1
				Gravitation	1	Gravitation: Newton's Law of Gravitation	1
					2	Motion of a particle in a central force field ,motion is in a plane, Angular momentum is conserved,	2

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						areal velocity is constant.	
					2	Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits.	2
					2	Weightlessness. Basic idea of global positioning system (GPS).	2
					1	Class Test	1
					2	Oscillations: Differential equation of SHM and its solutions	2
					2	Kinetic and Potential Energy, Total Energy and their time averages.	2
				oscillations	2	Damped oscillations. Forced harmonic oscillations, resonance	2
				Elasticity	2	Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants	2
					2	Poisson's Ratio- Expression for Poisson's ratio in terms of elastic constants	2
					2	Work done in stretching and work done intwisting a wire - Twisting couple on a cylinder	2
					2	Determination of Rigidity modulus by static torsion Torsional pendulum.- Bending of beam.	2
				Special theory of relativity	3	Special Theory of Relativity: Constancy of speed of light	3
					2	Postulates of Special Theory of Relativity. Length contraction. Time dilation.	2
					1	Relativistic addition of velocities	1
					1	Class Test	1
		PHSGCOR 01P	Mechanics Lab			General Topic Discussion on random errors in observations. Measurement principles of length (or diameter) using vernier caliper, screw gauge and travelling microscope. Discussion on the parts of Sextant.	

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				List of Practical	2	1. To study the random error in observations of time period of some oscillation using chronometer.	0
					2	2. To determine the Moment of Inertia of a regular body using another auxilary body and a cradle suspeded by a metalic wire	2
					2	3. To determine g and velocity for a freely falling body using Digital Timing Technique	0
					3	4. To determine the Young's Modulus by flexure method	3
			A	Modern Algebra	2	5. To determine the Modulus of Rigidity of a Wire by a torsional pendulum.	2
					2	6. To determine the height of a building using a Sextant.	0
			B	Geometry	2	7. To determine the elastic Constants of a wire by Searle's method	0
					1	8. To determine the value of g using Bar Pendulum	1
					2	9. To determine the value of g using Kater's Pendulum	0
					2	10. To study the Motion of Spring and calculate, (a) Spring constant, (b) g and (c) Modulus of rigidity	2
2.	**2nd sem**	PHSGCOR 02T	**Electricity and Magnetism**	**Vector Analysis**			
				A	4	Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance	2
				B	3	Vector Integration, Line, surface and volume integrals of Vector fields	3
					1	Class test	1
				C	4	Gauss-divergence theorem and Stoke's theorem of vectors (statement only)	2
				Electrostatics			
				A	3	Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem	3
				B	3	Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor	3
					1	Class test	1
				C	2	Electric potential due to an electric dipole. Calculation of electric field from potential	1
				D	3	Capacitance of an isolated spherical conductor. Parallel plate condenser. Energy per unit volume in electrostatic field	2
					1	Class test	1
				E	4	Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric	2
					1	Class test	1
				Magnetism			

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				A	3	Magnetostatics: Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current	3
				B	2	Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law	2
				C	2	Magnetic properties of materials: Magnetic intensity, magnetic induction	2
				D	2	permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials. Electromagnetic	2
					1	Class test	1
				Electromagnetic Induction			
				A	2	Faraday's laws of electromagnetic induction, Lenz's law	2
				B	2	self and mutual inductance, L of single coil	1
					2	M of two coils. Energy stored in magnetic field	2
				C			
				Linear Network			
					3	Impedance of L, C, R and their combinations. Thevenin & Norton's Theorem.	2
					2	Maximum power transfer theorem and superposition theorem. Anderson's bridge. Maxwell	2
				Maxwell`s Equations and Electromagnetic Wave Propagation			
				A	4	Equation of continuity of current, Displacement current, Maxwell's equations	4
				B	1	Poynting vector, energy density in electromagnetic field .	1
				C	4	electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization	4
		PHSGCOR 02P	**Electricity and Magnetism Lab**		**General topic**	Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances (e) Checking electrical fuses and (f) circuit continuity check. Demonstration on Carey Foster's bridge, potentiometer, resistance box, inductor coil, moving coil galvanometer (in dead beat and ballistic mode), etc.	
				List of Practicals			
					2	1.To determine an unknown Low Resistance using Carey Foster's Bridge	0
					3	2. To verify the Thevenin and Norton theorems	3
					2	3. To verify the Superposition and Maximum power transfer theorems	2
					3	4. To determine self-inductance of a coil by Anderson's bridge	3
					3	5. To study response curve of a Series LCR circuit and determine its (a) Resonant	2

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						frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width	
					3	6. To study the response curve of a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q.	2
					2	7. To study the characteristics of a series RC Circuit	0
					2	8. To determine an unknown Low Resistance using Potentiometer	0
					2	9. To determine the resistance of a galvanometer using Thomson's method	0
					2	10. Measurement of field strength B and its variation in a solenoid (determine dB/dx)	0

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3.	**Sem-III**	PHSGCOR03T				
	Gen		A	Laws of Thermodynamics	22	
			B	ThermodynamicPotentials	10	
			C	Kinetic Theory of Gases	10	
			D	Theory of Radiations	6	
			E	Statistical Mechanics	12	
		PHSGCOR03P	A			
			B			
			C			
			D			
			E			
			F			

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1.	**Gen**	II			10	Remedial Classes	8