Semester: 2	Course No.: 123 (T)	Course Code: : PHE 123(T) Course Title Digital electronics and Electrostatics
Credits: 2		Course Category: Minor paper

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Overview of some basic theories related to the subject and study of fundamental concepts in physics
CO111 T-2	UNDERSTANDING	Understanding essential to study various different fields in Physics will be developed.
CO111 T-3	APPLYING	Ability to apply concepts of physics in science engineering and technology will be developed that will strengthen student's analytical abilities.
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	DC Circuits: RL circuits (Growth and decay of current), RC circuit (Charging and discharging of capacitor) L-C-R circuit in series with DC source only the case if $R^2/(4L^2) = 1/LC$ (i.e. up to the differential equation only). **Digital Electronics** Binary system, Binary to decimal and decimal to binary conversion, Binary arithmetic –addition and subtraction, unsigned numbers, signed numbers, 1's complement, arithmetic sums and subtraction using 2's complement, Logic gates: OR, AND, NOT gates, universal gates NOR and NAND gates Boolean laws and theorem, De Morgan's theorem, Duality theorem.	15

2	**Electrostatics:**
	1. Force, Field and Energy in Electrostatics:
	  Gauss' Law (Differential form), Some Applications of Gauss' Law, A Useful Theorem in Electrostatics, Electrostatic Potential, Relation between the Field and the Potential, Two Important Relations, Equipotential Surfaces, Electrostatic Energy, Electric Dipole, Dipole in Uniform Electric Field, Electric Dipole in a Non-uniform Electric Field.
	Text Book: Electromagnetics by B. B. Laud, New Age International Publishers (2nd Edition)
	        Articles: 1.7 to 1.17.
		15

Suggested Text Books:
 1.   Digital principles and applications by A P Malvino and D P Leach ,

   Chapter 1, articles 1.3 to 1.7 , Chapter 4, articles 4.1 to 4.3 , Chapter 5,5.1
    to 5.6, 4th edition,1986, Mc-Graw Hill Publication.
 2.   Electromagnetics, Chapter 1 articles 1.7 to 1.15 , B B Laud , 3rd edition ,2011 , New Age
International, Publishers,

Reference books:
   1.   Digital electronics by G. K Kharate, 2nd edition, 2010, Oxford university press.
   2.   Introduction to electrodynamics by David J.   Griffiths;
        Cambridge University Press, 4th edition, 2013.
   3.   Classical electromagnetism by H. C. Verma; 1st edition -   Bharati Bhavan Publishers & Distributors.
   4.   Electrodynamics by Gupta, Kumar and Singh, 22nd edition, 2014 Pragati
        Prakashan.

Semester: 2	Course No.: 123 (P)	Course Code: PHE 123(P) Course Title: : Physics lab
Credits: 2		Course Category: Minor paper

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Get acquainted and learn the use of different laboratory instruments
CO111 T-2	UNDERSTANDING	Understanding of the principles involved in general physics , optics and electronics will become clear .
CO111 T-3	APPLYING	Using experimentally measured data different physical quantities related to general physics , optics and electronics will be obtained .
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	**GROUP: A** 1. Stefan's law. To verify the Stefan Boltzmann's fourth power law by using dc power source. 2. Diagonalization of matrix. 3. Newton's rings To find the wave length of light of given monochromatic source To find the radius of curvature of given lens. 4. Deflection Magnetometer To determine the magnetic moment (M) of given bar magnet using deflection magnetometer in Gauss A and B position. 5. Spectrometer Calibration of spectrometer and find the wavelength of unknown line of a mercury spectrum 6. To find the moment of inertia of a rolling body about an axis passing through the centre of the body on an inclined plane.	30
2	**GROUP: B** 1. Activation energy of a diode. 2. Decay Constant. 3. Projection Method To find the value of low resistance by the method of projection of potential. 4. Absorption coefficient of liquid using photocell. 5. LDR Characteristics Obtain IV characteristics of given LDR and calculate its resistance (for at least three different light levels). 6. Full-wave Rectifier	30

	Obtain load characteristic and % of regulation of Full-wave rectifier without filter and with capacitor filter. Determine ripple factor also.	

Reference books:

1.B. Sc. Practical Physics by C. L. Arora , 20th Edition , 2020 S. Chand and

   Company

2. Practical Physics by G. L. Squires. 4th edition , Cambridge , 2001.

3. Practical Physics with viva – voce Dr.S.L. Gupta and Dr.V.Kumar , 27th
   edition , 20210 Pragati Prakashan .