

Semester 2
Minor Course-123T
(2 Credits)

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:

- 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.
- Electromagnetics, Chapter 1 articles 1.7 to 1.15 , B B Laud , 3rd edition , 2011 , New Age International, Publishers,

Reference books:

- Digital electronics by G. K Kharate, 2nd edition, 2010, Oxford university press.
- 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.