PH-9251 Physics Lab-III (Materials Science and Digital Electronics)

L	T	P	C
0	0	8	4

Course Outcomes:
After successful completion of the course, the students should be able to

CO1: verify the theoretical formulations/ concepts of physics.

CO2: know the art of recording the observations of an experiment scientifically.

CO3: learn by doing.

CO4: handle and operate the various elements/parts of an experiment.

CO5: understand the importance of physics experiments in engineering & technology.

CO/PO Mapping
S-strong, M-medium and W-weak indicate the strength of correlation

COs	Programme outcomes (POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	W	W	W		W		M	S	S	S	S
CO2	S	S	S	M	S	W	M	W	M	W		M
CO3	S	W	M	W	W	S	S	S	S	M	S	S
CO4	S	S	W		W	M	M		M	S	W	W
CO5	M	W	S	W	S		S	M			M	W

w.e.f. July,

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Condensed Matter Physics:

1. To trace hysteresis loop and calculate the retentivity, coercivity and saturation magnetization.
2. To determine the dielectric constant of ferroelectric ceramics and also to determine the Curie temperature of ferroelectric ceramics as well as ferrite material.
3. To determine the band gap of a semiconductor using:
   a) PN junction diode.
   b) four probe method
4. To study Hall effect in a semiconductor and to determine (i) Hall voltage and Hall coefficient (ii) the number of charge carriers per unit volume (iii) mobility of charge carriers.
5. To study Hall effect in given metal and to determine (i) Hall voltage and Hall coefficient (ii) the number of charge carriers per unit volume (iii) mobility of charge carriers.
6. To determine the velocity of ultrasonic waves in a given liquid using ultrasonic interferometer.
7. To determine the transition temperature of a high temperature superconductor.
8. To prepare a metallic sample and measure the grain size using metallurgical microscope.
9. To find the capacitance and permittivity of the given material.
10. Dispersion relation of monoatomic and diatomic lattice.

Digital Electronics:

11. (a) To study logic gates: OR, AND, NOT, NOR, NAND, XNOR and XOR.
    (b) To verify De-Morgan's theorems.
11. To study: encoder, decoder and ALU
12. To study shift registers; and half and full adder/subtractor circuits
14. To study:
    a) ADC and DAC
    b) pulse width and pulse position modulation/demodulation