Course No: BS-PHY 111   **Title: Engineering Physics**
Semester: I (New)   **Credits: 2 (1+1)**

UNIT	Topics to be covered	Book No.	Chapter No.	Weightage
I	**Magnetism** Classification of magnetic material: Dia, Para and Ferromagnetism, Langevin's theory of dia and Para magnetism. Curie-Weiss law	1	13	30%
	Surface Tension and Viscosity: Molecular forces, Molecular theory, Surface energy & tension, Pressure difference across liquid surface, Capillary rise method, Jaeger's method, Viscosity & coefficient of viscosity, Streamline & Turbulent flow, Reynold's number, Poseuille's equation, Stoke's Law & Terminal velocity	2	8	
II	**Semiconductor Physics**: Distinction between metals, Insulators & Semiconductors. Intrinsic & Extrinsic semiconductor, Effect of temp. on semiconductor.	2	60	35%
	Superconductivity Superconductivity, critical current strength, Meissner effect, Isotope effect & electron-Photon interaction, Type-I, II superconductors, Applications.	3	11	
III	**Lasers** Spontaneous & stimulated emission, Einstein A & B coefficients, Population inversion, He-Ne & Ruby Lasers, Concept of MASER	2	31	35%
	Fiber Optics & Illumination Optical fiber, Physical structure, Basic theory, Types of modes, Input output characteristics of optical fiber, Numerical Aperture, Applications of fiber optics.	2	32	
	Laws of illumination, Luminous flux, Luminous intensity, Candle power, Brightness, transmission & reflection	2	24	

				100%
	coefficient.			

Practical Exercisec

1) To determine wavelength of Laser beam
2) To determine divergence of HE-Ne Laser
3) To find Numerical aperture of optical fiber
4) To set up the fiber optic analog and digital link
5) To find the frequency of AC supply using an electrical vibrator
6) To study induced emf as a function of velocity of magnet
7) To study phase relationship in LR circuit
8) To study LCR circuit
9) To determine Surface tension by capillary rise method
10) Determination of Surface tension by Jaeger's method
11) To determine Coefficient of Viscosity by Stokes method
12) Determination of Coefficient of Viscosity by Poiseuille's method
13) To study variation of thermo emf of Copper-Constantan thermo- couple with temp.
14) To determine energy band gap in semiconductor
15) To find wavelength of light by prism
16) To study the variation of magnetic field with distance along axis of a current carrying circular coil

Suggested readings

Text Books:

1) Solid state Physics – Saxena B.S. and Gupta R.C., Pragati Prakasah, 16th Edition
2) Engineering Physics- R.K.Gaur and S.L. Gupta, Dhanpat Rai Pub.New Delhi 8th Edition
3) Modern Physics for Engineers – S.P.Taneja, S.Chand Co. New Delhi , 10th Edition 2014

Reference Books:

1) Atomic Physics- J.B. Rajam, R.Chand New Delhi , 7th Edition 1999
2) Fundamentals of Molecular Spectroscopy – Colin Banwell, Mc Cash, Tata Mc Graw Hill, New Delhi,4th Edition

3) Elements of properties of matter – D.S.Mathur
4) Optical state Physics and Fiber optics- Sarkar Sabir Kumar,S.Chand New Delhi
5) Elements of Spectroscopy- Gupta S.L. Sharma R.C., Pragati Prakashan, Meeruth
6) Fundamentals of Magnetism and Electricity – Vasudeva D.N., S.Chand New Delhi
7) A Text Book of optics – Brijlal Subramaniyam, S.Chand Co. New Delhi , 24th Edition

➢ **Electronics New Syllabus**

    Course No: BS-PHY-242   **Title:** Applied Electronics &
Instrumentation

Semester: IV (New)   **Credits:** 2 (1+1)

UNIT	Topics to be covered	Book No.	Chapter No.	Weight age
I	**Semiconductor Physics** PN Junction, V-I characteristics of PN junction, Breakdown voltage, Knee voltage, Peak inverse voltage.	1	5	25%
	Semiconductor Diode: Semiconductor Diode, Rectifiers, Efficiency of HWR, Full wave rectifier & it's types, Ripple Factor, Filter circuits, Types of filter circuits. Clipper and clamper.	1	6	
II	**Transistors**: Transistor, Transistor action, Symbols, Transistor connections: Common Base, Common Emitter, Common Collector connection, Transistor as an amplifier in CE mode, Faithful amplification. Transistor biasing, stabilization.	1	8,9, 11,12	25%
	Transistor amplifier Single stage transistor amplifier, Practical circuit of transistor amplifier, Multistage transistor amplifier & it's important terms.	1	13, 14,15	
III	**Operational Amplifiers** Operational amplifier, Schematic symbol of op-amp, Electrical parameters of Op-Amp, Ideal Op-Amp Characteristics, Inverting and, non-inverting amplifier, Equivalent circuit of Op-Amp.	**1**	25	25%

	Digital Electronics Decimal to Binary Conversion, Binary to Decimal Conversion, Logic gates (AND, OR, NOT, NAND, NOR), NAND gate as universal gate, Boolean Algebra, Boolean Theorems.	1	26	
IV	**Instrumentation** Measurement and it's aim, Functional element of instrument, performance characteristics, static characteristics (Calibration, Accuracy, Precision, Repeatability, Reproducibility, Resolution, hysteresis, Sensitivity, dead zone, backlash, true value), static error, sources of error ,dynamic characteristics (speed of response, fidelity, lag, dynamic error) Measurement of displacement (LVDT, LDR, Capacitive and Inductive pick up), Temperature (Thermocouple, Thermistor, RTD).	2	1,7	25%

Practical Exercise:

1) To study V-I characteristics of PN junction diode
2) To study Half wave rectifier
3) Study of Centre tap Full wave and Bridge rectifier
4) To study transistor characteristics in CE configuration
5) To study Diode as Clipper
6) Study of working of diode as clamper
7) To Study frequency response of Single stage transistor amplifier
8) To study Op-Amp IC741 as Inverting amplifier
9) Study of Op-Amp as Non inverting amplifier
10) To study the function and implementation of logic gates i.e. AND, OR, NOT, NAND,NOR, EX-OR gates
11) Study of LVDT/ LDR.
12) Study of Thermocouple
13) Study of RTD
14) Study of Thermistor
15) Study of Capacitive pick up
16) Study of Inductive pick up.

Suggested readings

Text Books:

1) Principles of Electronics (11th edition) – V.K. Mehta, Rohit Mehta, S.Chand Co. New Delhi.
2) Industrial instrumentation and control (Third edition) -by S.K.Singh, Tata Mc-Graw Hill Pub.

Reference Books:

1) Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad, PHI Pvt.Ltd. New Delhi, 4th Edition.
2) Linear Integrated Circuits – D.Roy Choudhary, Shail B. jain, New age Internatioal pub., 2nd Edition.
3) Electronic Instrumentation – S.K. Khedkar, Pune VidyarthiGriha Pub. 3rd Edition.
4) Electronic fundamentals and applications- John D. Ryder, PHI Pvt.Ltd. New Delhi
5) Electronic Devices and circuits – Sanjeev Gupta, Sontosh Gupta, DhanpatRai Pub.
6) Digital Principles and applications – Albert Malvino, Donald leach
7) Measurement of electronics and electronics Instrumentation – Sawhney A.K. Dhanpat Rai Pub. New Delhi.
8) Modern Digital Electronics – R.P.Jain, Tata Mc-Graw Hill Pub., IVth Edition