



HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B. Sc. PHYSICS - SEMESTER – II

TYPE OF COURSE: INTER/ MULTI DISCIPLINE SPECIFIC COURSE

PROGRAMME CODE: SCIUG101 COURSE CODE: SC23MDSCPHY203

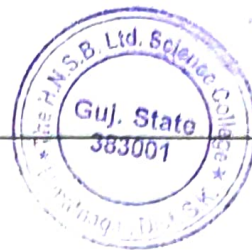
COURSE NAME: ELECTRICITY AND OPTICS

Effective from June 2023 Under NEP – 2020

Total Credits: 02	Theory	External Marks - 25
Teaching Hours per Week: 02		Internal Marks - 25
Teaching Hours per Semester: 30		

:: Syllabus ::

Unit No.	Content	Credit	Lect. Hrs 30
Unit-1	Electricity: D.C. Circuits: Simple R-L Circuit-Growth and decay of current Helmholtz equitation (11.24), R-C Circuit (11.25), Measurement of High Resistance by method of leakage (11.26), Comparison of capacities by De- Sauty 's Method (11.27), Ideal L-C. Circuit (11.28), Series L-C-R Circuit (change case only) (11.29) (<i>Related Examples & Problems</i>) Network Theorems: Thevenin's Theorem (18.6), Maximum Power Theorem (18.8) A.C. Bridges.: AC Bridges (17.5) A.C. Bridges for the measurement of inductances (17.6) (1) Maxwell Bridge (2) Anderson Bridge A.C. Bridge for the measurement of <i>capacitance</i> (17.7) (1) De Sauty's A.C Bridge (2) Schering Bridge (<i>Related Examples & Problems</i>) Basic Reference: <i>Electricity and Magnetism</i> by 'K.K. Tewari (S. Chand & Company Ltd)	1	15
Unit-2	Optics: Refraction Through Lenses: Introduction of various shape of Lenses, Lenses(4.2), Lens equation(4.9), Smallest separation of object and real image in a Convex Lens(4.13), Deviation by a thin Lenses(4.15), Power of Lens(4.15), Equivalent Focal Length of two thin lenses Separated by a finite distance (4.17), Focal Length(4.17.1), Cardinal points(5.2) Aberrations: Introduction (5.1), The Achromatic Doublet (5.2.1), Monochromatic aberration (5.3), Spherical aberration (5.3.1) (<i>Related Examples & Problems</i>) Interference: Interference in Thin Films (8.15), Interference due to Reflected light (8.16), Interference due to Transmitted light (8.17), Newton's Rings (8.23), Determination of the Wavelength of Sodium Light using Newton's Rings (8.24), Refractive index of a liquid using Newton's Rings, Refractive index using Graph (8.25) (<i>Related Examples & Problems</i>) Basic Reference: 1) <i>A Textbook of OPTICS</i> By N.Subhramanyam & Brijlal (S.Chand Co. Ltd.) 2) <i>Optics</i> by Ajay Ghatak (THM Edition) (For Aberration)	1	15



Other References – Further Readings

- Electrical Circuit Analysis by Sony and Gupta
- Network Analysis by G.K. Mittal. (Khanna Publications)
- Electricity and Magnetism by D. C. Tayal
- Principal of Optics by B.K Mathur (S. Chand & Company Ltd)
- Optics and Atomics Physics by D.P. Khandelval (Himalaya Publishing house)
- A Text book of Optics by N Subhramanyan and Brijalal

Principal
The H.S.N.B. Ltd. Science College
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B. Sc. PHYSICS - SEMESTER – II (PRACTICAL COURSE)

PROGRAMME CODE: SCIUG101

(Effective from June 2023 Under NEP – 2020)

TYPE OF COURSE	CREDIT	COURSE CODE
Multi Discipline Core Course (MDSCP)	2	SC23MDSC P PHY203

Teaching Hours per Week: 04 Hours for 2 Credit practical and Teaching Hours per Semester: 60 Hours

LABORATORY EXPERIMENTS

Multi Discipline Core Course (MDSCP) Practical

1. Numerical Analysis: Jacobi interaction Method.
2. Plotting of a Graph and Error estimation on graphical plot. Linear and nonlinear graph, Logarithmic Graph, Polar Graph
3. To Find the vertical distance between two points using Sextant.
4. Determine Modulus of Rigidity (Moment of Inertia) of Disk using Torsional pendulum
5. Numerical: Gauss Backward Interpolation Formula
6. Determination of angular acceleration (α) and find MI of a Fly wheel using Formula
7. To Determine the value of Cauchy's Constants of material of Prism
8. Study of Parallel Resonance with variable capacitor and Fix Frequency
9. Decay of Potential across Condenser
10. Measurement of Boltzmann constant using Diode.
11. PN Junction IV characteristics and Load Line analysis.
12. Study of Step Down Transformer. To determine Turn Ratio, % of Efficiency, Energy loss due to copper loss for a given transformer


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