

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B. Sc. PHYSICS - SEMESTER – I (PRACTICAL COURSE)

PROGRAMME CODE: SCIUG101

(Effective from June 2023 Under NEP – 2020)

TYPE OF COURSE	CREDIT	COURSE CODE
Major Discipline Core Course (MJDCP)	2 (Group A)	SC23MJDC P PHY101(A)
Major Discipline Core Course (MJDCP)	2 (Group B)	SC23MJDC P PHY101(B)
Minor Discipline Core Course (MIDSCP)	2	SC23MIDSC P PHY102
Inter-Discipline Core Course (MDCP)	2	SC23MDSC P PHY103

Teaching Hours

Teaching Hours per Week : 08 Hours for 4 Credit practical (120 Hours per Semester)
Teaching Hours per Week : 04 Hours for 2 Credit practical (60 Hours per Semester)

Course Objectives:

- To gain practical knowledge by applying the experimental method to correlate with the Physics theory.
- To provide hands on experience with equipment such as, spectrometer, Pendulum, Flywheel and electronic circuits.
- To learn the usage of electrical and optical systems of various measurements.
- To impart practical knowledge by performing experiments based on the principles of theory courses.
- To provide training how to analyze the experimental data and graphical analysis.
- To develop intellectual communication skills and discuss the basic principles of scientific concepts in the group.

EXPERIMENTS

FOR MAJOR COURSE 2 Credit for Group A

COURSE CODE: SC23MJDC P PHY101(A)

- Determine a Damping coefficient, Relaxation and quality factor in the damped motion of a simple Pendulum.
- Study of Resonator: Verification of relation $n^2 (V + kv) = \text{constant}$ and determine the frequency of unknown for k.
- Determination of angular acceleration (α) and find MI of a Fly wheel using plot α verses Torque.
- Arrangement of Spectrometer for parallel rays using Schuster method and to find Angle of Prism.
- Calibration of the Spectrometer and determines the wavelength of unknown line of Hg-spectrum.
- To Find Refractive index of liquid using convex lens.
- Analysis of error.
- Verification of Stefan Boltzmann's fourth power law using A.C./D.C. Source
- Melde's Experiment: (i) To prove P/L constant and (ii) P²T constant
- Least square Method
- Study of Travelling Microscope, To determine Gauz element, Diameter of tube, width of auxiliary slit
- To find the Young's Modulus of the material of a Rectangular Bar by Bending. (Y by cantilever)

LABORATORY EXPERIMENTS
For MAJOR COURSE 2 Credit for Group B
COURSE CODE: SC23MJDS P PHY101(B)

1. V-I characteristics of Zener diode
2. Study of Zener Diode as a voltage Regulator.
3. Study of the Series Resonance with Frequency Variation. (**C** constant)
4. Determination of the capacitance 'C' of a condenser.
5. P-N Junction diode as Half Wave Rectifier Without filter. Calculation of Percentage of Regulation.
6. P-N Junction diode as Half Wave Rectifier (i) With Series Inductor Filter
(ii) With Shunt Capacitor Filter. Calculation of Percentage of Regulation.
7. Verification of Thevenin's Theorem.
8. Study of Logic Gates: AND, OR and NOT. Verification of Truth table and giving understanding of voltage level for "0" and "1" level.
9. Experimental Measurements of Power Supply, Resistor, Diode, Transistor by Multimeter
10. Study of Step Up Transformer. To determine Turn Ratio, % of Efficiency, Energy loss due to copper loss for a given transformer.
11. Study of Bridge Rectifier (i) Without filter (ii) With Series Inductor Filter
(iii) With Shunt Capacitor Filter. Calculation of Percentage of Regulation.
12. Study of Maximum Power transfer Theorem

Course Outcome: Learning Outcomes

By the end of the course, the students will be able to understand.

- The basic principles of Physics related to their courses in the practical way.
- The operational details of spectrometer, electronic circuits etc.
- The experimental design aspects to determine various properties of like gravity, qualifactor, Refractive index, determination of Cauchy's Constants, analysis of spectra, Analysis of error, determine value of unknown frequency etc.
- The process to analyze the observations and infer the outcome of the experiments.
- How to analyze the experimental data and graphical analysis.