



HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B. Sc. PHYSICS - SEMESTER – I

TYPE OF COURSE: INTER/MULTI DISCIPLINE SPECIFIC COURSE

PROGRAMME CODE: SCIUG101

COURSE CODE: SC23MDSCPHY103

COURSE NAME: Waves-Sound and Electronics

(Effective from June 2023 Under NEP – 2020)

Total Credits: 02	Theory	External Marks -25
Teaching Hours per Week:2		Internal Marks - 25
Teaching Hours per Semester: 30		

Course Objective:

- To develop knowledge about theory of resonator and its application, ultrasonic waves, its production and application
- To develop knowledge about basic concepts, working of various rectifier and Filter circuits.

Course Outcome:

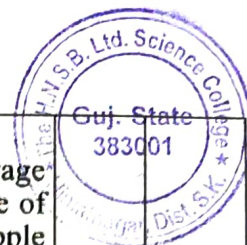
After the successful completion of the course students will be able to

- Learns about Ultrasonics, production and its applications.
- Will Get sufficient knowledge of sound and theory of resonator.
- Learns sufficient knowledge of various rectifier, Filter circuits and applications of them

Unit-1	Waves and Sound: Wave: Theory of Resonator (6.16), Dependence of the Frequency of resonator on the size and shape of the mouth (6.17), Velocity of Transverse waves along a stretched string (7.1), law's of Transverse Vibration of Strings (7.3), Melde's Experiment (7.5), Kundt's Tube (7.13) (<i>Related Examples & Problem</i>)	1	15
	Ultrasonic waves: Ultrasonics (11.23), Production of Ultrasonics (11.24), Magneto-Striction Effect (11.24.2), Piezo-Electric Effect Method-Oscillator(11.24.3), Detection of Ultrasonic Waves(11.25), Applications of Ultrasonic waves (11.27) (<i>Related Examples & Problem</i>) Basic Reference : <i>Waves And Oscillations</i> by N. Subhramanyam & Brijlal (Vikas Publishing House Pvt. Ltd, – 2 nd Revised Edition.		


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Unit-2	Electronics: Rectifier and Power Supply: The Half Wave Rectifier (4.1) - [Average or D.C. output Voltage, Average or D.C. output current, RMS value of output current, Rectifier efficiency(Ratio of Rectification), Ripple factor, Voltage Regulation, Peak inverse voltage(PIV), Transformer Utilization Factor (TUF)], The Full Wave Rectifier (4.2) - [Average or D.C. output current, RMS value of output current, Average or D.C. output Voltage, Rectifier efficiency(Ratio of Rectification), Ripple factor, Voltage Regulation, Peak Inverse Voltage(PIV), Transformer Utilization Factor(TUF)], Comparison of Half and Full Wave Rectifiers Circuit (4.3), <i>The Bridge Rectifier</i> (4.4), Filter Circuits: The Half Wave Rectifier with Series Inductor Filter(4.7.1) and with capacitor filter(4.7.2), The Full Wave Rectifier with Series Inductor Filter(4.7.3), Choke Input Filter or L-section Filter(L-C Filter)(4.7.4), Capacitor Input Filter(C-L-C Filter or π-Filter), [Comparison of L and π-section filter circuits] Basic Reference : <i>Hand book of Electronics by Gupta and Kumar</i>	1	15
: Further Reading – Other References : • University Physics by Sears, Zeemansky and Young (Norosa Publishing House) • A Text Book On Oscillations, Wave and Acoustics by M. Ghosh & D. Bhattacharya (S.Chand Co) • Vibration, Waves & Heat by Sears and Zeemansky • Electronic Device & Circuits by Allen Mottershead , (PHI Pvt. LTD) • Electronics and Radio Engineering by M.L.Gupta. • Basic Electronis and Linear circuits by Bhargva Kulshreshth & Gupta TMH Edition • Elements of Electronics by Bagde & Singh			




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

PROGRAMME CODE: SCIUG101
(Effective from June 2023 Under NEP – 2020)

TYPE OF COURSE	CREDIT	COURSE CODE
Multidisciplinary Core Course (MDSCP)	2	SC23MIDSC P PHY103

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

Multi Discipline Core Course (MIDSCP) Practical

1. Determine a Damping coefficient, Relaxation and quality factor in the damped motion of a simple Pendulum.
2. Study of Resonator: Verification of relation $n^2 (V + kv) = \text{constant}$ and determine the frequency of unknown for k.
3. Determination of angular acceleration (α) and find MI of a Fly wheel using plot α verses Torque
4. To Find Refractive index of liquid using convex lens.
5. Verification of Stefan Boltzmann's fourth power law using A.C. /D.C. Source
6. Study of Travelling Microscope, To determine Gauz eliment, Diameter of tube, width of auxiliary slit
7. V-I Characteristics of Zener diode and Determine Breakdown voltage
8. Study of Zener Diode as a voltage Regulator.
9. P-N Junction diode as Half Wave Rectifier (i) Without filter. Calculation of Percentage of Regulation.
10. P-N Junction diode as Full Wave Rectifier (i) With Series Inductor Filter
(ii) With Shunt Capacitor Filter. Calculation of Percentage of Regulation
11. Study of Logic Gates: AND, OR and NOT. Verification of Truth table and giving understanding of voltage level for "0" and "1" level.
12. Study of Bridge Rectifier Without filter. Calculation of Percentage of Regulation.


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