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

Course Objective:

- To develop knowledge about theory of resonator and its application, ultrasonic waves, its production and application
- To develpoe 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) (*Related Examples & Problem)* **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) (*Related Examples & Problem)* **Basic Reference :** *Waves And Oscillations by N. Subhramanyam & Brijlal (Vikas Publshing House Pvt. Ltd, – 2nd Revised Edition.*	1	15

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), ***The Bridge Rectifier*** (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 :** *Hand book of Electronics by Gupta and Kumar*	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