Semester 2
Multidisciplinary Course-124T
(Elective Course – 2 Credits)

Semester: 2	**Course No.: 124 (T)**	**Course Code: :** PHMDC 124(T) **Course Title: :** Sound , Ultrasonic and Indian Astronomy
Credits: 2		**Course Category: Multidisciplinary**

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Overview of some basic theories related to sound , ultra sonic and Indian astronomy
CO111 T-2	UNDERSTANDING	Understanding in fundamentals in sound , ultra sonic and Indian astronomy will be developed .
CO111 T-3	APPLYING	Ability to apply concepts of physics in science engineering and technology will be developed that will strengthen student's analytical abilities .
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	**Sound waves and Ultrasonic** Introduction, Intensity & intensity level, Loudness & pitch radiation from a piston, diffraction, radiation efficiency of a sound source. Magnetostriction method, Piezo-electric oscillator, Piezo-electric detectors, Measurement of velocity of ultrasonic waves, diffraction effect & its application to determine the velocity of the waves, the ultrasonic waves & its use. Architectural Acoustics, Sabine's formula, Reverberation time-theoretical treatment, Reverberation time of a live room, Reverberation time of a dead room, optimum reverberation time.	15
2	**Indian Astronomy** Historical Introduction : Introduction, Ancient Indian Astronomy, The Vedic Period and Vedangajyotisa, Siddhanta, Aryabhata I, Astronomers after Aryabhata, Contents of the Siddhantas, Continuity in Astronomical Tradition. Celestial Sphere Introduction, Diurnal Motion of Celestial Bodies, Motion of Celestial Bodies Relative to Stars, Celestial Horizon, Meridian, Polar Star and Directions, Zodiac and Constellations, Equator and Poles, Latitude of a place and Altitude of Polar Star, Ecliptic and the Equinoxes. Co-ordinate Systems Introduction, Ecliptic System, Equatorial System, Horizontal System, Meridian System, Phenomenon of Precession of Equinoxes, Ancient Indian References to the Precession, Effects of Precession on Celestial Longitude, Tropical and Sidereal Longitudes. Rasi and Naksatra Systems .	15

Suggested text Books:

1. A textbook on oscillations, waves & acoustics by M. Ghosh, D. Bhattacharya, Chpter 23 , articles 23.1 to 23.7 , Chapter 24 , articles 24.1 to 24.6 , 3rd edition , 2006 , S. Chand and Company Ltd.
2. Indian astronomy: An introduction , S. Balachandra Rao,.
   Chapter 1 , articles: 1.1 to 1.8, Chapter 2 ,articles : 2.1 to 2.9,Chapter 3 , articles , 3.1 to 3.9, Chapter 4 , article 4.1. Distributed by Orient Longman Ltd, 1st edition, 2000.

Reference Books:

1. The Story of Astronomy in India by Chander Mohan, 2015.
2. Indian Astronomy a source book by B.V Subbaray Appa and K. V. Sharma , Nehru centre Bombay, 1985.