

Multidisciplinary Course

(Credits: 03)

UPHYMDC 10001/10002 (Theory): Introduction to Astronomy

45 Lectures

Unit 1: Astronomical Scales [7 hours]

Astronomical Distance, Mass and time scales. Parallax, Distance measurement. Distance between Earth and Sun (Astronomical unit), Light year, Parsec, Pinhole camera for measurement of radius of the sun. Celestial Spheres. Astronomical Coordinate Systems. Construction of Galilean Telescope, other optical Telescopes and magnification power. Celestial objects visible with them.

Unit 2: Eclipse [6 hours]

Solar eclipse, Lunar eclipse, Total, annular and partial eclipses.

Unit 3: Sun [6 hours]

Transient phenomenon : Sun spot, Solar storm, Diamond ring in the Sun and the source of energy in the Sun, Tides

Unit 4: Night sky [9 hours]

Name of constellations, Nebula, Comets, Kuiper belt, Solar system, Planets with habitable conditions, Search for Extra Terrestrial Intelligence (S.E.T.I.).

Unit 5: Stars and its classifications [5 hours]

HR diagram, Normal Stars, White dwarf, Neutron star, Black hole

Unit 6: The Milky way [7 hours]

Basic structure and properties of the Milky Way.

Unit 7: Galaxies [5 hours]

Elliptical, Spiral and Lenticular galaxies, Galactic halo.

Reference Books:

- Modern Astrophysics, B. W. Carroll & D. A. Ostlie, Addison-Wesley Publishing Co.
- Introductory Astronomy and Astrophysics, M. Zeilik and S. A. Gregory, Saunders College Publishing.
- The physical universe: An introduction to astronomy, F. Shu, Mill Valley: University Science Books.
- Fundamentals of Astronomy (Fourth Edition), H. Karttunen *et al.* Springer.
- Astro Physics a modern perspective-K. S. Krishnasamy, (New Age International (P) Ltd, 2002)
- An introduction to Astrophysics - Baidyanath Basu, (Prentice-Hall of India Private limited, 2001).
- Textbook of Astronomy and Astrophysics with elements of cosmology, V. B. Bhatia, Narosa Publication.