

Value Added Course 1

Title: Astrophysics and Cosmology

Unit:1 Early Universe and Cosmological models

15 hours

Thermal history of the universe – time line of important dates, big bang nucleosynthesis, structural formation, cosmic microwave background, inflation, Friedman-Robertson-Walker metric for a homogeneous, isotropic universe, Friedman equation from Newton's and Hubble's laws, Scale-dependence of different energy forms Cosmological models with one energy component, The Λ CDM model

Unit:2 Astronomical distances

15 hours

The electromagnetic spectrum, Measuring the telescope characteristics, Panchromatic observations, Spectroscopic observations, a brief overview of emission processes, Trigonometric parallax, other geometric methods and parallaxes, Doppler Effect and redshift, Hubble's law, the cosmic distance ladder

Total Lecture hours

30 hours

Text Book(s)

- 1 Introduction to Astronomy & Cosmology by I. Morrison (Wiley, 2008)
- 2 Telescopes and Techniques by C.R.Kitchin (Springer, 1995)
- 3 A Concise Introduction to Astrophysics, Lecture notes by Michael. Kachelriess
- 4 Basics of Astrophysics: Veronique Buat

Reference Books

- 1 An Introduction to Astronomy and Astrophysics, Pankaj Jain, CRC Press,2015.
- 2 An Introduction to Cosmology.V.Narlikar, Cambridge university press, 2002.

Scheme of Assessment

1. First Internal Assessment tests (for C1) will be conducted after 8th week of the semester comprising 50% of the syllabus.
2. Second Internal Assessment tests (for C2) will be conducted in the 16th week of the semester comprising remaining 50% of the syllabus.
3. The C1 and C2 Internal Assessment tests evaluation will be an aggregate of written test, assignments, seminar by the corresponding Course teacher/teachers.
4. A student will be eligible for C3 final examination, if he/she has scored a minimum of 30% which is the sum total of C1test and C2 test.
6. C3 final examination will be conducted in 18th week of the Semester. .

The pattern of evaluation is provided below

Examination	Unit 1	Unit 2	Average score	Assignment	Seminar	Total Marks
C1	5	5	5	5	--	10
C2	5	5	5	--	5	10
C3	15	15				30