

PHY305A: Physics of Universe

Academic Year: 2023-2024; Semester I, 3-0-0-0 (9)

Instructor: Gopal Hazra, Department of Physics, IIT Kanpur

Lectures: 17:00-18:00 hours on Monday, Wednesday and Friday

(For any extra discussion-time or any queries, feel free to email at hazra@iitk.ac.in)

Prerequisite: None

Objective: This course is intended towards undergraduate students to introduce the world of astrophysics. The course will emphasize on fundamentals of astrophysics starting from basic celestial mechanics to the interaction of radiation with matter, stellar structure, star formation, stellar evolution and extragalactic astronomy. A brief introduction to cosmology will also be covered.

Course-Content (from OARS Course Master Database):

Astronomical observations and instruments, photometry, stellar spectra and stellar structure, stellar evolution, nucleosynthesis and formation of elements, variable stars, compact stars, star clusters and binary stars, galaxies, their evolution and origin, active galaxies and quasars, Big Bang model, early Universe and Cosmic Microwave Background Radiation

Selected Reference Books:

1. Astrophysics in a Nutshell, Dan Maoz, Princeton university press (2007)
2. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge University Press (2010)
3. An Introduction to Modern Astrophysics, B. W. Carroll and D. A. Ostlie, Cambridge University Press
4. An Introduction to Astronomy and Astrophysics, Pankaj Jain, CRC press

Evaluation Scheme:

Quiz-1 (15%), Mid-Sem Examination (25%), Quiz-2 (15%), End-Sem Examination (45%). Taking End-Sem examination is mandatory.