Course Type	Course Code	Name of Course	L	T	P	Credit
OE	PHO302	INTRODUCTION TO ASTROPHYSICS AND ASTRONOMY	3	0	0	9

Course Objective

The objective of the course is

- To provide a glimpse of the ever mysterious and stirring world of space and related phenomena to the beginners or to the curious students of any discipline other than physics;
- To motivate students to choose a career in related areas of physics;
- To prepare a base for an ambitious physics student who wants to go to advanced studies or research in relevant fields.

Learning Outcomes

Upon successful completion of this course, students will:

- Able to understand various astrophysical phenomenon.
- Eligible for higher studies in astronomy and astrophysics
- will be familiar with the basic ideas and Stellar formation and evolution, and be able to apply current basic models.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**Fundamentals:** Overview of major contents of universe, The scale of the universe: Mass, length and time scales in astrophysics, Celestial coordinates, Magnitude Scale, Sources of Astronomical information	7	This unit provides a broad knowledge of major celestial contents and basics of astronomical measurement.
2	**Basics of Astronomy**: Telescopes: Refracting and reflecting, Ground based and space based, Data handling, Astronomy in different bands of electromagnetic radiation: Optical, Radio, X-Ray Astronomy.	8	This unit gives a broad knowledge about different kinds of instruments used for astronomical observation.
3	**Stellar Astrophysics**: Properties of Ordinary stars: Stellar colors, Stellar distances, basic knowledge of stellar atmospheres, Spectral types, Hertzprung-Russel Diagram.	8	This unit will help students in understanding Stellar Properties and classification.
4	Binaries, variable stars. Stellar Evolution, White dwarfs, Supernovae, Neutron Stars, Blackholes, Pulsars. Clusters of stars, open and globular clusters	8	Helps students in understanding Stellar formation and evolution, and be able to apply current basic models.
5	**Universe at large:** Galaxies, Types of galaxies. Normal and active galaxies, Shape, size and contents of Milky Way galaxy.	5	This unit is related to information regarding the major contents of the universe.
6	**Sun**: Basic Structure, Solar Corona, Chromosphere, Solar Activity, Solar wind.	6	Helps in the understanding of different solar phenomenon
	Total	**42**	

Textbooks:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge University Press
2. Astronomy: A Physical Perspective, Marc L. Kutner
3. An Introduction to Astronomy and Astrophysics, Pankaj Jain, Taylor & Francis, 2015

Reference Books:

1. The Physical Universe, F. Shu, University of California, 1982.
2. Astrophysical Concepts, M. Harwit, 3rd edition, Springer-Verlag, 2006.
3. Elements of Space Physics, R. P. Singhal, PHI Learning, 2009
4. BW Carroll & DA Ostlie, An Introduction to Modern Astrophysics, Latest Edition, Addison-Wesley.