Semester 5
Skill Enhancement course
SEC-356
Course – 2Credits

Semester: 5	**Course No.: 356**	**Course Code: PHSEC 356** **Course Title- BASICS OF SOLAR PHYSICS AND ASTROPHYSICS**
Credits: 2	1 Session = 1 hour	**Course Category: Skill Enhancement Course**

Course Objectives:

The objectives of this course are to:

1.Understand the structure, composition, and behaviour of the Sun, including its atmospheric layers and solar activity.

2.Analyze solar phenomena such as sunspots, solar radiation, and the temperature structure of the corona.

3. Introduce the nature and origin of cosmic rays and understand their interaction with Earth's atmosphere.

4. Examine the characteristics and energy distribution of primary and secondary cosmic rays.

5. Explore the astrophysical significance of high-energy phenomena and cosmic particle confinement.

Course Outcomes:

By the end of this course, students will be able to:

CO	Course Outcome	Bloom's Verb
CO-1	Describe the basic structure, composition, and visible features of the Sun. Explain the layers of the solar atmosphere and analyse phenomena like the solar corona and solar temperature distribution.	**Understand Apply Analyze**
Co-2	Interpret the causes and effects of solar activity, including sunspot formation and the solar cycle. Identify the components of cosmic rays and explain the origin, energy spectrum, and nature of primary and secondary cosmic rays. Discuss the astrophysical significance of cosmic rays and describe mechanisms of their confinement and propagation	**Apply Analyze**

Unit No.	Unit Contents	Hours
1	**Sun and Solar Radiation** Introduction, Astronomical, background, General description of the sun, Solar structure, Sun's outer layers, Composition, Visible feature on the sun, More about sun's outer atmosphere, Temperature of the corona, Solar Activity and Sunspot cycles.	**15**
2	**Cosmic Rays and High Energy Astrophysics** An Introduction to cosmic rays and high energy astrophysics: primary cosmic radiation, energy spectrum of primary cosmic rays, secondary cosmic rays, photons in primary cosmic rays, origin of cosmic rays, basic facts about cosmic rays, region of confinement.	**15**

Reference:

1. An Introductory course on Space Science and Earth's Environment,S. S. Degaonker (Gujrat University Publication, Ahmedabad).

2. Astrophysics: Stars and Galaxies,K. D. Abhyankar, Universities Press(India).

3. A Textbook of Astronomy and Astrophysics with Elements of Cosmology,V. B. Bhatia, Narosa Publishing House.

4. Astrophysics and Stellar Astronomy,S. K. Basu, New Central Book Agency.

5. Introduction to Astrophysics: The Stars, Baidyanath Basu, PHI Learning. Elements of Astrophysics, Arnab Rai Choudhuri, Universities Press (India).