KU2MDCPHY102 : Wonders of The Cosmos

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
II	MDC	100	KU2MDCPHY102	3	45

Learning Approach (Hours/ Week)		Marks Distribution			Duration of ESE (Hours)
Lecture+ Tutorial	Practical	CE	ESE	Total	
3	0	25	50	75	1.5

Course description:

This course offers an introduction to astronomy and provides students a foundational understanding of observational astronomy, celestial objects and basic techniques for amateur stargazing. Students will gain practical skills and theoretical knowledge to explore the wonders of the cosmos through a combination of lectures, demonstrations, and observations

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the historical development of astronomy from ancient models to modern theories	*U*
2	Analyse the contributions of Ptolemy, Copernicus, Galileo, and Kepler in astronomy	*An*
3	Understand the fundamental concepts of celestial sphere, celestial coordinates, and motion of celestial bodies	*U*

4	Apply scientific reasoning to interpret astronomical observations and phenomena	*A*
5	Interpret the causes and effects of celestial phenomena such as eclipses, apply observational techniques to locate and identify celestial objects in night sky	*U,A*

Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)

Mapping of Course Outcomes to PSOs/POs

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**
CO1	3	2	1	2	2	3	2
CO2	3	2	1	3	3	3	2
CO3	3	3	2	3	3	2	1
CO4	3	3	2	3	3	3	2
CO5	3	3	2	3	3	3	1

Correlation level 0-None, 1-Slight, 2-Medium, 3-High

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	**UNIT**	**DESCRIPTION**	**HOURS**
1	**Introduction to Astronomy**		**10**

	1	The Nature of Astronomy, The Nature of Science, The Laws of Nature, Numbers in Astronomy, A Tour of the Universe, The Universe on the Large Scale, The Universe of the Very Small, A Conclusion and a Beginning	3
	2	Ancient Astronomy- Astronomy around the World, Early Greek and Roman Cosmology, Ptolemy's Model of the Solar System, Astrology and Astronomy, the beginnings of Astrology, the Horoscope, Astrology Today	3
	3	The Birth of Modern Astronomy-Copernicus, The Heliocentric Model, Galileo and the Beginning of Modern Science, Galileo's Astronomical Observations, Kepler's Laws of Planetary Motion, Orbits in the Solar System	3
		Sections 1.1-1.4,1.6-1.9, 2.1-2.4, 3.1, 3.4, 6.1 Book 1	
2	**Night sky & Moon**		**6**
	1	Darkness and Light, Finding Your Way around the Sky, Cosmic Protractor, Special Effects, Night Vision, The Milky Way	2
	2	Moon: Phases of Moon, Characteristics, Moonrise, Moonset, Moon Illusion	2
	3	Sightseeing on the moon, Lunar topography, Formation, Lunar Eclipse	2
	Chapter 1 & 2 of Book 2		
3	**Sun and Planets**		**10**
	1	Sun, how seasons happen, Sun paths, Telling time by the Sun, A visit to the sun, Power house, Storms on Sun, How the Sun formed, Our sun is born	2
	2	Solar Eclipse, How Are Eclipse of the Sun and Moon the Same-and Different? Why Can't We Look at the Sun? What to take eclipse-watching	2
	3	Planets: Earth's siblings in the sky, Star or Planet? Sky Wanderer, Roaming around Solar system	2
	4	Terrestrial & Jovian Planets, Small solar system Bodies, Meet the eight planets	2

	5	How the Solar System Formed, Comets, Other suns and their Solar Systems	2
	Chapter 3 and 4 of Book 2		
4	**Stars & Constellations**		**10**
	1	Stars and Constellations: How stars move during the night, North star	2
	2	North & South Using the Stars, The Zodiac, and the Ecliptic, Rasis & Nakshatras	2
	3	Seasonal Sky gazing Northern Hemisphere - November, December & January Stars. (Constellations Orion, Canis Major, Lepus, Taurus, Gemini, Auriga)	3
	4	How Stars Are Born, Live, and Die, Meteor Shower. Deep Sky Objects.	3
	Chapter 5 of Book 2 and Chapter 3 & 10 of Book 3		
5	**Teacher Specific Module**		**9**
	Directions		
	Demonstrations using Stellarium or any other sky guide apps – constellations, eclipses, planetary alignment etc.		

Essential Readings:

1. Astronomy 2e by Andrew Fraknoi, David Morrison, and Sidney C. Wolff, OpenStax CNX , 2022. Web version 2024. https://open.umn.edu/opentextbooks/textbooks/390
2. Sky Gazing- A Guide to the Moon, Sun, Planets, Stars, Eclipses, and Constellations by MegThacher, Storey Publishing, 2020.
3. The Joy of Star watching 3rd Edn by Biman Basu, National Book Trust, India, 2022.

Assessment Rubrics:

Evaluation Type		Marks
ESE		**50**
CCA		**25**
a)	*Test Paper	10
c)	**Assignment/ Book- Article Review	5
d)	Seminar/ Viva -Voce	10
Total		**75**

*Best out of two test papers

** or any other activities like quiz, open book exam, group activity