AC- 04/12/2024
Item No- 8.33 (N) (2)

As Per NEP 2020

UNIVERSITY OF MUMBAI

Syllabus for Basket of OE/Value-added Certificate course	
Ad Hoc Board of Studies in Centre for Extra - Mural Studies	
UG Programme	
Semester	**1**
Title of Paper	**Credits**
Basic Astronomy	**2**
From the Academic Year	**2025-26**

Sr. No.	Heading	Particulars
1	**Description the course:**	**Basic Astronomy** People of any skill level or age can start developing hobby in astronomy and gain a better understanding of the universe of which we are a part. The study of the astronomy cultivates nearly every faculty of the mind; the memory, the reasoning power, and the imagination all receive from it special exercise and development. Eligibility: H.S.C (12^{th} Standard) Pass
2	**Vertical :**	Open Elective
3	**Type :**	Theory
4	**Credit**:	2 credits
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Learning Objectives:** 1) Communicate scientific concepts and scientific thought processes. 2) Inculcate curiosity towards astronomical concepts. 3) Develop skills in map-reading and graphical understanding of data. 4) Develop critical thinking	
8	**Course Outcomes:** After completing the course, the learner will be able to 1) Enlist the different types of celestial bodies 2) Estimate basic orbital parameters of planets and satellites 3) Use star maps to correlate the sky with different seasons. 4) Apply classification based on stellar properties 5) Comprehend astronomical articles in magazines 6) Critically evaluate various media articles on astronomical events 7) Use authentic astronomy online resources to enhance understanding	

9	**Modules**:- Per credit One module can be created
	Module 1: Planetary motions and Constellations (15 hours)
	1) Introduction to sky: Constellations, introduction to sky, diurnal motion, equatorial coordinates, celestial Sphere, time calculations, rising-setting formulae, various celestial objects, reading of star maps 2) Solar system: Planets, Minor Bodies, Kepler's laws, Titius-Bode law, Synodic-Sidereal period, Elongation, Magnitude 3) Laws of Physics: Newton's laws of motion, Gravitational law, Tidal forces, Roche limit, tides due to Sun and Moon 4) Orbits of planets, Lagrange points, satellites, space probes, Eclipses, Transits and Occultations
	Module 2: Stars and galaxies (15 hours)
	1) Stellar studies: visual properties of stars: magnitude, spectral class, colour index, HR diagram, Electromagnetic spectrum, emission/absorption spectrum, Doppler shift, Black body radiation, Stephan's law, Wien's displacement law 2) Structure of star: nuclear fusion cycles, Evolution of star: nebula, protostar, main sequence, white dwarf, neutron star, pulsar, black hole 3) Formation of solar systems, exoplanets and detection methods 4) Deep sky objects: open cluster, globular cluster, types of nebulae, structure of galaxy and Cosmology: Hubble's law, standard candle, evolution of universe: big bang model
10	Text books

11	**Reference Books:** 1) Cosmic Adventures – Narlikar J. V. 2) Exploring the Universe – Brian Clegg 3) The Universe - Kauffman	
12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination 60% Individual Passing in Internal and External Examination**
13	**Continuous Evaluation through:** Quizzes/ Class Tests/ presentation/ project / creative writing / assignment etc. (at least 4)	Written Exam
14	**Format of Question Paper:** for the final examination 15 marks objectives (MCQ, match the pair, odd-man out, fill in the blanks) 15 marks short descriptive questions/problems 20-25% extra options in the question paper (i.e. solve 4 out of 5 or 10 out of 12 etc)	

Sign of the BOS Chairman
Dr. Madhavi Narsalay
Centre for Extra-Mural Studies

Sign of the
Offg. Associate Dean
Name of the Associate Dean
Faculty of

Sign of the
Offg. Dean
Name of the Dean
Faculty of