AC- 04/12/2024
Item No - 8.33 (N) (3)

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	**I**
Title of Paper	**Credits**
Astronomy and Astrophysics	**4**
From the Academic Year	**2025-26**

Sr. No.	Heading	Particulars
1	**Description the course:**	**Astronomy and Astrophysics** 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 :**	Skill Enhancement
3	**Type :**	Theory + Practical
4	**Credit**:	4 credits
5	**Hours Allotted :**	90 Hours (30 Hours theory + 60 Hours activities)
6	**Marks Allotted**:	100 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: Introduction to Astronomy (21 hours)	
	1) Introduction to sky: Constellations, introduction to sky, diurnal motion	

	2) Celestial Sphere and Coordinate Systems (Theory + Tutorials) 3) Time in Astronomy (Theory + Tutorials),Star map reading, Stellarium softwares 4) Panchanga system (IKS element), Astronomical models (Tutorial)	
	Module 2: Solar System and Planetary Science (24 hours)	
	1) Planets (Theory + Tutorial) ,Minor Bodies 2) Celestial kinematics (Theory + Tutorial) and Celestial dynamics (Theory + Tutorial) 3) Eclipses, Transits and Occultations (Theory + Tutorial) 4) Formation of solar systems, exoplanets and detection methods 5) Science Results from Space probes and Dynamics of Space probes	
	Module 3: Stellar Physics (24 hours)	
	1) Optics for Astronomers (Theory + Tutorial) 2) Spectral Physics (Theory + Tutorial) 3) Stellar studies and Variable and Binary stars 4) Evolution of stars (Theory + Tutorial) and Distance measurement in astronomy (Theory + Tutorial)	
	Module 4: Galaxies and Cosmology (21 hours)	
	1) Foundations of Quantum Physics and Relativity 2) Physics of Radio astronomy (Theory + Tutorial) 3) Stellar clusters and galaxies (Theory + Tutorial) 4) Cosmological models (Theory + Tutorial)	
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/	Written Exam

	project / creative writing / assignment etc. (at least 4)	
14	**Format of Question Paper:** for the final examination 30 marks objectives (MCQ, match the pair, odd-man out, fill in the blanks) 30 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