

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE Vertical 3

Faculty of Science

Board of Studies in Physics

Second Year Programme

Semester

III

Title of Paper

Credits

Astronomy and Space Missions – II

2

From the Academic Year

2025-26

Title of Paper - Astronomy and Space Missions – II

Sr. No.	Heading	Particulars
1	Description of the course : Including but Not limited to :	Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc.
2	Vertical :	Open Elective
3	Type :	Theory / Practical
4	Credit:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted :	30 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives: (List some of the course objectives) After successful completion of this course students will be able to: 1) Study the principles behind rocket launching and space vehicles, insights into space exploration technologies. 2) Familiarize yourself with India's space program, its significant contributions to national development and scientific advancement.	
8	Course Outcomes: (List some of the course outcomes) After the end of this course student will be able to, 1) Explain the principle of Rocket launching and other space machines. 2) Gain the knowledge of space missions worldwide. 3) Know the Indian Space program and its contribution for the nation building.	
9	Modules:- Per credit One module can be created	
	Module 1: Unit-I: Space Missions	(15 Lectures)
	1. Introduction to Space Missions: Rockets, types and their applications, Different types of orbits, Artificial satellites – basic idea and their applications, Introduction to Space Missions, Beginning of Space Missions - World and India, Applications of Space Research, Space crafts, Launching Vehicles. 2. Topics for Self-study: Major Space Centres in the World (at least 10) – brief idea about their location, establishment, capabilities and achievements. People behind space programs – at least 2 from India. Successful Missions (Any Five).	
	Module 2: Unit-II: Indian Space Research Organisation (ISRO)	(15 Lectures)

1. About ISRO and its Goals, History of Creation.
2. **General Satellite Programmes:** The IRS series, The INSAT series. Gagan Satellite Navigation System, Navigation with Indian Constellation (NavIC), Other satellites.
3. **Launch vehicles:** Satellite Launch Vehicle (SLV), Augmented Satellite Launch Vehicle (ASLV), Polar Satellite Launch Vehicle (PSLV), Geosynchronous Satellite Launch Vehicle (GSLV).
4. **Experimental Satellites:** Details and applications (Any Five) Earth Observation Satellites: Details and applications (Any Five) Communication satellites: Details and applications (Any Five)
5. **Topics for Self-study:** Chandrayaan 1: Details and applications. Mars Orbiter Mission: Details and applications.

10	Reference Books: 1. The story of Astronomy In India-Chander mohan-Research Gate (2015) 2. Stargazing for Dummies-Steve Owens-John Wiley & Sons (2013) 3. A Skywatcher's Year-Jeff Kanipe-Cambridge University Press (1999) 4. The Casual Sky Observer's Guide-Rony De Laet-Springer (2012) 5. https://www.isro.gov.in/		
11	Internal Continuous Assessment: 40%	External, Semester End Examination 60% Individual Passing in Internal and External Examination	
12	Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)		
13	Format of Question Paper: for the final examination		
	Format of Question Paper for OE:		(2 Credits)
	External – 30 Marks Internal – 20 Marks		
	Question Paper Format for 30 Marks		
	Duration: One Hour		
	Unit -I (15Marks)	Q:1 A) Attempt any TWO i) Theory ii) Theory iii) Theory iv) Theory B) Attempt any One i) Problem ii) Problem	10Marks 05 Marks

	Unit -II (15Marks)	Q:2 A) Attempt any TWO	10Marks
		i) Theory ii) Theory iii) Theory iv) Theory B) Attempt any One i) Problem ii) Problem	05 Marks

Sd/-

**Sign of the BOS Chairman
Dr. T.N. Ghorude
Board of Studies in
Physics**

Sd/-

**Sign of the
Offg. Associate Dean
Dr. Madhav R. Rajwade
Faculty of Science &
Technology**

Sd/-

**Sign of the
Offg. Dean
Prof. Shivram S. Garje
Faculty of Science &
Technology**