Name of the Department: Physics

OEC: Space Missions

Course Title: Space Missions	**Course code: 21BSCOEPH**
Total Contact Hours: 42	**Course Credits:** 03
Internal Assessment Marks: 40 marks	**Duration of SEE:** 03 Hours
Semester End Examination Marks: 60 marks	
Note: This course shall be offered to students from all disciplines, except students who opt Physics DSC courses.	

Course Outcomes (COs):

At the end of the course, students will be able to:

1. Explain basic ideas of space missions.
2. Recognise major space centers and space scientists in the World.
3. Explain the contributions of NASA & ISRO for space missions.
4. Explain the applications of satellite.

OEC 4: Space Missions

Unit	Description	Hours
1	**Introduction to Space Missions:** Rockets, types and their applications, Orbits - 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.	08
2	**Space Centers and Space Scientists** 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 space Missions (Any Five). contributions of Scientists from Karnataka to Indian Space Program and use of space technology in the local district.	08
3	**National Aeronautics and Space Administration (NASA)** About NASA and its Goals, History of Creation. Foundational human spaceflight: X-15 program (1954–1968), Project Mercury (1958–1963), Project Gemini (1961–1966), Project Apollo (1960–1972), Skylab (1965–1979), Apollo-Soyuz (1972–1975). Modern human spaceflight programs: Space Shuttle program (1972–2011), International Space Station (1993–present), Constellation program (2005–	09

	2010), Commercial Crew Program (2011–present), Journey to Mars (2010–2017), Artemis program (2017–present).	
4	**Indian Space Research Organisation (ISRO)** About ISRO and its Goals, History of Creation. General Satellite Programmes: The IRS series, The INSAT series. Gagan Satellite Navigation System, Navigation with Indian Constellation (NavIC), Other satellites. Launch vehicles: Satellite Launch Vehicle (SLV), Augmented Satellite Launch Vehicle (ASLV), Polar Satellite Launch Vehicle (PSLV), Geosynchronous Satellite Launch Vehicle (GSLV). Experimental Satellites: Details and applications (Any Five)	09
5	**Applications of satellites and Success Stories of Space** Earth Observation Satellites: Details and applications (Any Five), Communication satellites: Details and applications (Any Five), Application of satellites in agriculture, communication, weather forecasting, exploration of natural resources and Global positioning system (GPS). Success stories: Apollo 11, Chandrayaan 1, Mars Orbiter Mission (MoM). Proposed space programmes of NASA and ISRO.	08
References: https://en.wikipedia.org/wiki/NASA https://www.isro.gov.in/		