

| COURSE CODE | COURSE TITLE | L | T | P | C |
|--------------------|--------------------------|----------|----------|----------|----------|
| 1154AE111 | SPACE EXPLORATION | 1 | 0 | 0 | 1 |

Course Category:

University Elective

a. Preamble:

The course aims at providing an understanding of the history and developments in space related technology.

b. Prerequisite Courses:

- Nil

c. Related Courses:

- Nil

d. Course Educational Objectives :

- To discuss in general about the history of space exploration

e. Course Outcomes :

Upon the successful completion of the course, students will be able to:

| CO Nos. | Course Outcomes | Knowledge Level (Based on revised Bloom's Taxonomy) |
|----------------|--|--|
| CO1 | CO 1: The history of space exploration and its cultural. | K2 |
| CO2 | CO 2: Fundamentals of aerospace engineering | K2 |
| CO3 | CO 3: The key aspects of space systems and the space environment | K3 |
| CO4 | CO 4: Current trends of Space Exploitation | K2 |
| CO5 | CO 5: Future projects in space exploration | K3 |

Correlation of COs with POs:

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | H | | | | | | | | | | | |
| CO2 | H | | | | | | | H | | | | |
| CO3 | H | | | | | M | | H | | | M | |
| CO4 | H | | | | | M | | H | | | M | |
| CO5 | H | | | | | | | | | M | | |

H- High; M-Medium; L-Low

Course Content

Unit 1: Visionaries and Basic Operation. L-3

Introduction to space travel-Promoting space travel - Pioneers and visionaries - The motion of celestial bodies - Principles of rocket operation - Chemical rockets - V-2. Rockets.

Unit 2: The dawn of the Space Age. L-3

Treaty of Rome and Sputnik - Intercontinental Ballistic Missiles - International Astronautical Federation - Rockets and Atmospheric exploration -The Space Environment -Sputnik and the birth of the space era - First Man in Orbit - Moon Race – Apollo.

Unit 3: Space Cooperation. L-3

Post-Moon-race cooperation -Soyuz-Apollo programme - Birth of ESA - The International Space Station (ISS) - Introduction to Space Systems - Accessing space.

Unit 4: The Exploitation of Space L-3

Life in space – Need for space -Telecommunications - Earth Observation – GNSS - Space Situational Awareness - Space technologies.

Unit 5: Future and Ambition L-3

Human Exploration of the Solar System - Robotic Exploration of the Solar System -Scientific Exploration of the Universe -Space Tourism - Getting farther and beyond limitations - Electric propulsion.

Total: 15 Hours