

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. SEMESTER : VIII**  
**AERONAUTICAL ENGINEERING**

Subject Name: **SPACE DYNAMICS**

| <b>Sr. No.</b> | <b>Course Contents</b>   | <b>Total Hrs</b> |
|----------------|--|------------------|
| <b>1.</b>      | <b>Fundamentals of space flight</b><br>Newon's laws of gravitation, gravitational potential, escape velocity, mechanics of circular orbits and circular velocity noncircular orbits.   | <b>06</b>        |
| <b>2.</b>      | <b>Basic mechanics and governing principles</b><br>The two body problem, Derivation of Kepler's laws from Newton's Law.  | <b>08</b>        |
| <b>3.</b>      | <b>Space flight orbits and atmosphere entry</b><br>Orbit Equation, space vehicle trajectories, transfer orbits and orbit changes, Introduction to Earth and Planetary entry, Equations of motion for atmosphere entry. Application to ballistic entry, case study. | <b>08</b>        |

**Text Books:**

1. Introduction to flight – J D Anderson
2. Mechanics of flight - A C kermode

**Reference Books:**

1. Space Dynamics – G A Gurzadyan