1. Record Nr. UNINA9911019181203321

Autore	Tewari Ashish
Titolo	Foundations of Space Dynamics
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2020 ©2020
ISBN	1-119-45532-4 1-119-45533-2 1-119-45530-8
Edizione	[1st ed.]
Descrizione fisica	1 online resource (371 pages)
Collana	Aerospace Ser.
Disciplina	629.4/11
Soggetti	Orbital mechanics Space vehicles - Dynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Chapter 1 Introduction -- 1.1 Space Flight -- 1.1.1 Atmosphere as Perturbing Environment -- 1.1.2 Gravity as the Governing Force -- 1.1.3 Topics in Space Dynamics -- 1.2 Reference Frames and Time Scales -- 1.2.1 Sidereal Frame -- 1.2.2 Celestial Frame -- 1.2.3 Synodic Frame -- 1.2.4 Julian Date -- 1.3 Classification of Space Missions -- 1.3 Exercises -- 1.3 References -- Chapter 2 Dynamics -- 2.1 Notation and Basics -- 2.2 Plane Kinematics -- 2.3 Newton's Laws -- 2.4 Particle Dynamics -- 2.5 The nBody Problem -- 2.6 Dynamics of a Body -- 2.7 Gravity Field of a Body -- 2.7.1 Legendre Polynomials -- 2.7.2 Spherical Coordinates -- 2.7.3 Axisymmetric Body -- 2.7.4 Spherical Body with Radially Symmetric Mass Distribution
Sommario/riassunto	"Space dynamics is one of the most important topics in aerospace engineering. It governs the satellites launched into an Earth orbit as well as lunar and interplanetary space exploration missions. The successful launching and operation of all spacecraft requires a good knowledge of space dynamics. Space dynamics can be divided into two broad categories: (i) orbital mechanics, and (ii) attitude dynamics. Orbital mechanics is a study of the translational motion of a spacecraft

under the gravitational influence of either one or several large bodies. Attitude dynamics is the study of rotational motion of a rigid spacecraft about its own centre of mass, and includes both kinematical and kinetic description in terms of Euler angles, quaternion, or Rodrigues/modified Rodrigues parameters, and the angular velocity components."--