1.	Record Nr.	UNINA9910917194603321
	Autore	Jochim Ernst Friedrich Maria
	Titolo	Satellite Equivalence Orbits : Analysis of Orbits Combining Different Motions / / by Ernst Friedrich Maria Jochim
	Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
	ISBN	9783031584763
		3031584767
	Edizione	[1st ed. 2024.]
	Descrizione fisica	1 online resource (494 pages)
	Collana	Space Technology Library, , 2542-8896 ; ; 42
	Disciplina	629.434
	Soggetti	Outer space - Exploration
		Astronautics
		Aerospace engineering
		Astrophysics
		Mechanics
		Space Exploration and Astronautics
		Aerospace Technology and Astronautics
		Classical Mechanics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	INTRODUCTION -- COMPILATION OF RELATED SATELLITE ORBITAL MOTIONS -- EQUIVALENCE ORBITS RELATED TO MERIDIONAL MOTION -- EQUIVALENCE ORBITS RELATED TO SUN-SYNODIC MOTION -- EQUIVALENCE ORBITS RELATED TO MOON-SYNODIC MOTION -- NEAR-PARALLEL EQUIVALENCE SATELLITE ORBITS -- MULTIPLE COUPLING OF EQUIVALENCE ORBITS -- EQUIVALENCE ORBITS RELATED TO A FIXED SATELLITE PERIOD -- COMPILATION OF SOME CHARACTERISTIC PROPERTIES OF SATELLITE -- APPENDIX -- REFERENCES -- LIST OF SYMBOLS -- INDEX.
	Sommario/riassunto	This book presents the essential characteristics of the different satellite motions. Satellite motions can be classified as anomalistic, draconitic, tropical, Hansen-, Kepler-, meridional, Sun-synodical, Moon-synodical motion, depending on the relevant reference point. When two of these types of motions (in some cases even more than two) are coupled,

satellite orbits are obtained, which are called equivalence orbits in this book. They share the special properties of the different coupled motions and are therefore of particular interest in the selection of special satellite orbits. In the book the author calculates mean equivalence orbits with secular perturbation formulas, as well as true equivalence orbits considering a complete orbit model including periodic motion effects. Some of the equivalence orbits can be determined unambiguously and with extremely high accuracy, they are stable in the long term. Others can only be found with low accuracy and reduced stability. The author investigates all possible combinations and the associated general equations of condition are derived in each case. Some well-known families of satellite orbits, such as the Sun-synchronous orbits, can be interpreted as mean equivalence orbits. The study of their stability is of great interest in orbit mechanics. Special applications and numerous numerical examples, graphical representations of all possible ranges of the Kepler elements, and detailed studies of the stability of particularly important equivalence orbits are carried out using the Brouwer orbit model as well as the modification by Eckstein. This lays the foundation for possible refinements using arbitrary extended orbital models and for possibly required orbital corrections. Numerous problems are to deepen the treated topics and/or to stimulate for further investigations. The book will be of interest to Astrodynamics and Aerospace Engineers as well as graduate students studying satellite orbits.