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KEY=APPLICATIONS - FITZGERALD RICHARD

FUNDAMENTALS OF ASTRODYNAMICS AND APPLICATIONS

Springer Science & Business Media Fundamentals of Astrodynamics and Applications is rapidly becoming the standard astrodynamics reference for those involved in the business of spaceflight. What sets this book apart is that nearly all of the theoretical mathematics is followed by discussions of practical applications implemented in tested software routines. For example, the book includes a compendium of algorithms that allow students and professionals to determine orbits with high precision using a PC. Without a doubt, when an astrodynamics problem arises in the future, it will become standard practice for engineers to keep this volume close at hand and 'look it up in Vallado'. While the first edition was an exceptionally useful and popular book throughout the community, there are a number of reasons why the second edition will be even more so. There are many reworked examples and derivations. Newly introduced topics include ground illumination calculations, Moon rise and set, and a listing of relevant Internet sites. There is an improved and expanded discussion of coordinate systems, orbit determination, and differential correction. Perhaps most important is that all of the software routines described in the book are now available for free in FORTRAN, PASCAL, and C. This makes the second

edition an even more valuable text and superb reference.

FUNDAMENTALS OF ASTRODYNAMICS AND APPLICATIONS

FUNDAMENTALS OF ASTRODYNAMICS

Courier Corporation Teaching text developed by U.S. Air Force Academy and designed as a first course emphasizes the universal variable formulation. Develops the basic two-body and n-body equations of motion; orbit determination; classical orbital elements, coordinate transformations; differential correction; more. Includes specialized applications to lunar and interplanetary flight, example problems, exercises. 1971 edition.

FUNDAMENTALS OF ASTRODYNAMICS

Courier Dover Publications Widely known and used throughout the astrodynamics and aerospace engineering communities, this teaching text was developed at the U.S. Air Force Academy. Completely revised and updated 2013 edition.

SATELLITE ORBITS

MODELS, METHODS AND APPLICATIONS

Springer Science & Business Media This modern presentation guides readers through the theory and practice of satellite orbit prediction and determination. Starting from the basic principles of orbital mechanics, it covers elaborate force models as well as precise methods of satellite tracking. The accompanying CD-ROM includes source code in C++ and relevant data files for applications. The result is a powerful and unique spaceflight dynamics library, which allows users to easily create software extensions. An extensive collection of frequently updated Internet resources is provided through WWW hyperlinks.

CELESTIAL MECHANICS AND ASTRODYNAMICS: THEORY AND PRACTICE

Springer This volume is designed as an introductory text and reference book for graduate students, researchers and practitioners in the fields of astronomy, astrodynamics, satellite systems, space sciences and astrophysics. The purpose of the book is to emphasize the similarities between celestial mechanics and astrodynamics, and to present recent advances in these two fields so that the reader can understand the inter-relations and mutual influences. The juxtaposition of celestial mechanics and astrodynamics is a unique

approach that is expected to be a refreshing attempt to discuss both the mechanics of space flight and the dynamics of celestial objects. "Celestial Mechanics and Astrodynamics: Theory and Practice" also presents the main challenges and future prospects for the two fields in an elaborate, comprehensive and rigorous manner. The book presents homogenous and fluent discussions of the key problems, rendering a portrayal of recent advances in the field together with some basic concepts and essential infrastructure in orbital mechanics. The text contains introductory material followed by a gradual development of ideas interweaved to yield a coherent presentation of advanced topics.

ORBITAL MECHANICS

THEORY AND APPLICATIONS

John Wiley & Sons A lively study of orbital mechanics by the writer responsible for the computer simulations and systems analysis for the Saturn V moon rocket, Project Skylab and many others. Provides thorough coverage of all background theories, including unusual concepts and paradoxes that will enhance appreciation of this field. Includes discussion of rocket propulsion and optimization of techniques for maximizing payload and minimizing fuel consumption, plus complete coverage of the interaction of space vehicles and space bodies.

PRACTICAL ASTRODYNAMICS

Springer This modern textbook guides the reader through the theory and practice of the motion and attitude control of space vehicles. It first presents the fundamental principles of spaceflight mechanics and then addresses more complex concepts and applications of perturbation theory, orbit determination and refinement, space propulsion, orbital maneuvers, interplanetary trajectories, gyroscope dynamics, attitude control, and rocket performance. Many algorithms used in the modern practice of trajectory computation are also provided. The numerical treatment of the equations of motion, the related methods, and the tables needed to use them receive particular emphasis. A large collection of bibliographical references (including books, articles, and items from the "gray literature") is provided at the end of each chapter, and attention is drawn to many internet resources available to the reader. The book will be of particular value to undergraduate and graduate students in aerospace engineering.

ORBITAL MECHANICS FOR ENGINEERING STUDENTS

Elsevier Orbital Mechanics for Engineering Students, Second Edition, provides an introduction to the basic concepts of space

mechanics. These include vector kinematics in three dimensions; Newton's laws of motion and gravitation; relative motion; the vector-based solution of the classical two-body problem; derivation of Kepler's equations; orbits in three dimensions; preliminary orbit determination; and orbital maneuvers. The book also covers relative motion and the two-impulse rendezvous problem; interplanetary mission design using patched conics; rigid-body dynamics used to characterize the attitude of a space vehicle; satellite attitude dynamics; and the characteristics and design of multi-stage launch vehicles. Each chapter begins with an outline of key concepts and concludes with problems that are based on the material covered. This text is written for undergraduates who are studying orbital mechanics for the first time and have completed courses in physics, dynamics, and mathematics, including differential equations and applied linear algebra. Graduate students, researchers, and experienced practitioners will also find useful review materials in the book. NEW: Reorganized and improved discussions of coordinate systems, new discussion on perturbations and quaternions NEW: Increased coverage of attitude dynamics, including new Matlab algorithms and examples in chapter 10 New examples and homework problems

AN INTRODUCTION TO THE MATHEMATICS AND METHODS OF ASTRODYNAMICS

AIAA

STATISTICAL ORBIT DETERMINATION

Elsevier Statistical Orbit Determination presents fundamentals of orbit determination--from weighted least squares approaches (Gauss) to today's high-speed computer algorithms that provide accuracy within a few centimeters. Numerous examples and problems are provided to enhance readers' understanding of the material. Covers such topics as coordinate and time systems, square root filters, process noise techniques, and the use of fictitious parameters for absorbing un-modeled and incorrectly modeled forces acting on a satellite. Examples and exercises serve to illustrate the principles throughout each chapter.

ORBITAL MOTION IN STRONGLY PERTURBED ENVIRONMENTS

APPLICATIONS TO ASTEROID, COMET AND PLANETARY SATELLITE ORBITERS

Springer The investigation of minor solar system bodies, such as comets and asteroids, using spacecraft requires an understanding of orbital motion in strongly perturbed environments. The solutions to a wide range of complex and challenging problems in this field are reviewed in this comprehensive and authoritative work.

LUNAR TRANSFER ORBITS UTILIZING SOLAR PERTURBATIONS AND BALLISTIC CAPTURE

Herbert Utz Verlag

SPACE VEHICLE DYNAMICS AND CONTROL

Amer Inst of Aeronautics & "Space Vehicle Dynamics and Control, Second Edition" continues to provide a solid foundation in dynamic modeling, analysis, and control of space vehicles featuring detailed sections covering the fundamentals of controlling orbital, attitude, and structural motions of space vehicles. A new Part 5 is a collection of advanced spacecraft control problems and their practical solutions obtained by applying the fundamental principles and techniques emphasized throughout the book.

TENSOR AND VECTOR ANALYSIS

WITH APPLICATIONS TO DIFFERENTIAL GEOMETRY

Courier Corporation Assuming only a knowledge of basic calculus, this text's elementary development of tensor theory focuses on concepts related to vector analysis. The book also forms an introduction to metric differential geometry. 1962 edition.

OPTIMAL CONTROL WITH AEROSPACE APPLICATIONS

Springer Science & Business Media Want to know not just what makes rockets go up but how to do it optimally? Optimal control theory has become such an important field in aerospace engineering that no graduate student or practicing engineer can afford to be without a working knowledge of it. This is the first book that begins from scratch to teach the reader the basic principles of the calculus of variations, develop the necessary conditions step-by-step, and introduce the elementary computational techniques of optimal control. This book, with problems and an online solution manual, provides the graduate-level reader with enough introductory knowledge so that he or she can not only read the literature and study the next level textbook but can also apply the theory to find optimal solutions in practice. No more is needed than the usual background of an undergraduate engineering, science, or mathematics program: namely calculus, differential equations, and numerical integration. Although finding optimal solutions for these problems is a complex process involving the calculus of variations, the authors carefully lay out step-by-step the most important theorems and concepts. Numerous examples are worked to demonstrate how to apply the theories to everything from classical problems (e.g., crossing a river in minimum time) to engineering problems (e.g., minimum-fuel launch of a satellite). Throughout the book use is made of the time-optimal launch of a satellite into orbit as an important case study with detailed analysis of two examples: launch from the Moon and

launch from Earth. For launching into the field of optimal solutions, look no further!

SPACECRAFT ATTITUDE DETERMINATION AND CONTROL

Springer Science & Business Media Roger D. Werking Head, Attitude Determination and Control Section National Aeronautics and Space Administration/ Goddard Space Flight Center Extensive work has been done for many years in the areas of attitude determination, attitude prediction, and attitude control. During this time, it has been difficult to obtain reference material that provided a comprehensive overview of attitude support activities. This lack of reference material has made it difficult for those not intimately involved in attitude functions to become acquainted with the ideas and activities which are essential to understanding the various aspects of spacecraft attitude support. As a result, I felt the need for a document which could be used by a variety of persons to obtain an understanding of the work which has been done in support of spacecraft attitude objectives. It is believed that this book, prepared by the Computer Sciences Corporation under the able direction of Dr. James Wertz, provides this type of reference. This book can serve as a reference for individuals involved in mission planning, attitude determination, and attitude dynamics; an introductory textbook for students and professionals starting in this field; an information source for experimenters or others involved in spacecraft-related work who need information on spacecraft orientation and how it is determined, but who have neither the time nor the resources to pursue the varied literature on this subject; and a tool for encouraging those who could expand this discipline to do so, because much remains to be done to satisfy future needs.

MODERN ASTRODYNAMICS

FUNDAMENTALS AND PERTURBATION METHODS

Princeton University Press Newton's laws of motion and his universal law of gravitation described mathematically the motion of two bodies undergoing mutual gravitational attraction. However, it is impossible to solve analytically the equation of motion for three gravitationally interacting bodies. This book discusses some techniques used to obtain numerical solutions of the equations of motion for planets and satellites, which are of fundamental importance to solar-system dynamicists and to those involved in planning the orbits of artificial satellites. The first part introduces the classical two-body problem and solves it by rigorously developing the six integrals of the motion, starting from Newton's three laws of motion and his law of gravitation and then using vector algebra to develop the integrals. The various forms of the solution flow naturally from the integrals. In the second part, several modern perturbation techniques are developed and applied to cases of practical importance. For example, the perturbed two-body problem for an oblate planet or for a nonsymmetric rotating planet is considered, as is the effect of drag on a satellite. The two-body problem is

regularized, and the nonlinear differential equation is thereby transformed to a linear one by further embedding several of the integrals. Finally, a brief sketch of numerical methods is given, as the perturbation equations must be solved by numerical rather than by analytical methods.

FUNDAMENTALS OF SPACE SYSTEMS

Johns Hopkins University Appli Fundamentals of Space Systems was developed to satisfy two objectives: the first is to provide a text suitable for use in an advanced undergraduate or beginning graduate course in both space systems engineering and space system design. The second is to be a primer and reference book for space professionals wishing to broaden their capabilities to develop, manage the development, or operate space systems. The authors of the individual chapters are practicing engineers that have had extensive experience in developing sophisticated experimental and operational spacecraft systems in addition to having experience teaching the subject material. The text presents the fundamentals of all the subsystems of a spacecraft missions and includes illustrative examples drawn from actual experience to enhance the learning experience. It includes a chapter on each of the relevant major disciplines and subsystems including space systems engineering, space environment, astrodynamics, propulsion and flight mechanics, attitude determination and control, power systems, thermal control, configuration management and structures, communications, command and telemetry, data processing, embedded flight software, survivability and reliability, integration and test, mission operations, and the initial conceptual design of a typical small spacecraft mission.

SPACE FLIGHT DYNAMICS

John Wiley & Sons Thorough coverage of space flight topics with self-contained chapters serving a variety of courses in orbital mechanics, spacecraft dynamics, and astronautics This concise yet comprehensive book on space flight dynamics addresses all phases of a space mission: getting to space (launch trajectories), satellite motion in space (orbital motion, orbit transfers, attitude dynamics), and returning from space (entry flight mechanics). It focuses on orbital mechanics with emphasis on two-body motion, orbit determination, and orbital maneuvers with applications in Earth-centered missions and interplanetary missions. Space Flight Dynamics presents wide-ranging information on a host of topics not always covered in competing books. It discusses relative motion, entry flight mechanics, low-thrust transfers, rocket propulsion fundamentals, attitude dynamics, and attitude control. The book is filled with illustrated concepts and real-world examples drawn from the space industry. Additionally, the book includes a "computational toolbox" composed of MATLAB M-files for performing space mission analysis. Key features: Provides practical, real-world examples illustrating key concepts throughout the book Accompanied by a website containing MATLAB M-files for conducting space mission

analysis Presents numerous space flight topics absent in competing titles Space Flight Dynamics is a welcome addition to the field, ideally suited for upper-level undergraduate and graduate students studying aerospace engineering.

SPACECRAFT TRAJECTORY OPTIMIZATION

Cambridge University Press This is a long-overdue volume dedicated to space trajectory optimization. Interest in the subject has grown, as space missions of increasing levels of sophistication, complexity, and scientific return - hardly imaginable in the 1960s - have been designed and flown. Although the basic tools of optimization theory remain an accepted canon, there has been a revolution in the manner in which they are applied and in the development of numerical optimization. This volume purposely includes a variety of both analytical and numerical approaches to trajectory optimization. The choice of authors has been guided by the editor's intention to assemble the most expert and active researchers in the various specialities presented. The authors were given considerable freedom to choose their subjects, and although this may yield a somewhat eclectic volume, it also yields chapters written with palpable enthusiasm and relevance to contemporary problems.

GLOBAL POSITIONING SYSTEM

THEORY AND APPLICATIONS

AIAA

STRUCTURAL ANALYSIS

WITH APPLICATIONS TO AEROSPACE STRUCTURES

Springer Science & Business Media The authors and their colleagues developed this text over many years, teaching undergraduate and graduate courses in structural analysis courses at the Daniel Guggenheim School of Aerospace Engineering of the Georgia Institute of Technology. The emphasis is on clarity and unity in the presentation of basic structural analysis concepts and methods. The equations of linear elasticity and basic constitutive behaviour of isotropic and composite materials are reviewed. The text focuses on the analysis of practical structural components including bars, beams and plates. Particular attention is devoted to the analysis of thin-walled beams under bending shearing and torsion. Advanced topics such as warping, non-uniform torsion, shear deformations, thermal effect and plastic deformations are addressed. A unified treatment of work and energy principles is provided that naturally leads to an examination of approximate analysis methods including an introduction to matrix and finite element methods. This

teaching tool based on practical situations and thorough methodology should prove valuable to both lecturers and students of structural analysis in engineering worldwide. This is a textbook for teaching structural analysis of aerospace structures. It can be used for 3rd and 4th year students in aerospace engineering, as well as for 1st and 2nd year graduate students in aerospace and mechanical engineering.

SPACECRAFT SYSTEMS ENGINEERING

Wiley Following on from the hugely successful previous editions, the third edition of *Spacecraft Systems Engineering* incorporates the most recent technological advances in spacecraft and satellite engineering. With emphasis on recent developments in space activities, this new edition has been completely revised. Every chapter has been updated and rewritten by an expert engineer in the field, with emphasis on the bus rather than the payload. Encompassing the fundamentals of spacecraft engineering, the book begins with front-end system-level issues, such as environment, mission analysis and system engineering, and progresses to a detailed examination of subsystem elements which represent the core of spacecraft design - mechanical, electrical, propulsion, thermal, control etc. This quantitative treatment is supplemented by an appreciation of the interactions between the elements, which deeply influence the process of spacecraft systems design. In particular the revised text includes * A new chapter on small satellites engineering and applications which has been contributed by two internationally-recognised experts, with insights into small satellite systems engineering. * Additions to the mission analysis chapter, treating issues of aero-manoeuvring, constellation design and small body missions. In summary, this is an outstanding textbook for aerospace engineering and design students, and offers essential reading for spacecraft engineers, designers and research scientists. The comprehensive approach provides an invaluable resource to spacecraft manufacturers and agencies across the world.

ORBITAL MECHANICS AND ASTRODYNAMICS

TECHNIQUES AND TOOLS FOR SPACE MISSIONS

Springer This textbook covers fundamental and advanced topics in orbital mechanics and astrodynamics to expose the student to the basic dynamics of space flight. The engineers and graduate students who read this class-tested text will be able to apply their knowledge to mission design and navigation of space missions. Through highlighting basic, analytic and computer-based methods for designing interplanetary and orbital trajectories, this text provides excellent insight into astronomical techniques and tools. This book is ideal for graduate students in Astronautical or Aerospace Engineering and related fields of study, researchers in space industrial and governmental research and development facilities, as well as researchers in astronautics. This book also:

- Illustrates all key concepts

with examples · Includes exercises for each chapter · Explains concepts and engineering tools a student or experienced engineer can apply to mission design and navigation of space missions · Covers fundamental principles to expose the student to the basic dynamics of space flight

FUNDAMENTAL SPACECRAFT DYNAMICS AND CONTROL

John Wiley & Sons An extensive text reference includes around an asteroid – a new and important topic Covers the most updated contents in spacecraft dynamics and control, both in theory and application Introduces the application to motion around asteroids – a new and important topic Written by a very experienced researcher in this area

FUNDAMENTALS OF AEROSPACE NAVIGATION AND GUIDANCE

Cambridge University Press This text covers fundamentals in navigation of modern aerospace vehicles. It is an excellent resource for both graduate students and practicing engineers.

FUNDAMENTALS OF SPACECRAFT ATTITUDE DETERMINATION AND CONTROL

Springer This book explores topics that are central to the field of spacecraft attitude determination and control. The authors provide rigorous theoretical derivations of significant algorithms accompanied by a generous amount of qualitative discussions of the subject matter. The book documents the development of the important concepts and methods in a manner accessible to practicing engineers, graduate-level engineering students and applied mathematicians. It includes detailed examples from actual mission designs to help ease the transition from theory to practice and also provides prototype algorithms that are readily available on the author's website. Subject matter includes both theoretical derivations and practical implementation of spacecraft attitude determination and control systems. It provides detailed derivations for attitude kinematics and dynamics and provides detailed description of the most widely used attitude parameterization, the quaternion. This title also provides a thorough treatise of attitude dynamics including Jacobian elliptical functions. It is the first known book to provide detailed derivations and explanations of state attitude determination and gives readers real-world examples from actual working spacecraft missions. The subject matter is chosen to fill the void of existing textbooks and treatises, especially in state and dynamics attitude determination. MATLAB code of all examples will be provided through an external website.

ORBITAL MECHANICS FOR ENGINEERING STUDENTS

Butterworth-Heinemann Written by Howard Curtis, Professor of Aerospace Engineering at Embry-Riddle University, *Orbital Mechanics for Engineering Students* is a crucial text for students of aerospace engineering. Now in its 3e, the book has been brought up-to-date with new topics, key terms, homework exercises, and fully worked examples. Highly illustrated and fully supported with downloadable MATLAB algorithms for project and practical work, this book provides all the tools needed to fully understand the subject. New chapter on orbital perturbations New and revised examples and homework problems Increased coverage of attitude dynamics, including new MATLAB algorithms and examples

HANDBOOK OF SATELLITE ORBITS

FROM KEPLER TO GPS

Springer Science & Business Fifty years after Sputnik, artificial satellites have become indispensable monitors in many areas, such as economics, meteorology, telecommunications, navigation and remote sensing. The specific orbits are important for the proper functioning of the satellites. This book discusses the great variety of satellite orbits, both in shape (circular to highly elliptical) and properties (geostationary, Sun-synchronous, etc.). This volume starts with an introduction into geodesy. This is followed by a presentation of the fundamental equations of mechanics to explain and demonstrate the properties for all types of orbits. Numerous examples are included, obtained through IXION software developed by the author. The book also includes an exposition of the historical background that is necessary to help the reader understand the main stages of scientific thought from Kepler to GPS. This book is intended for researchers, teachers and students working in the field of satellite technology. Engineers, geographers and all those involved in space exploration will find this information valuable. Michel Capderou's book is an essential treatise in orbital mechanics for all students, lecturers and practitioners in this field, as well as other aerospace systems engineers. —Charles Elachi, Director, NASA Jet Propulsion Laboratory

SOLAR SAILING

TECHNOLOGY, DYNAMICS AND MISSION APPLICATIONS

Springer Science & Business Media Solar sailing - using the sun as a propellant - offers the possibility of low-cost long-distance missions that are impossible with conventional spacecraft. This first comprehensive book on this propulsion method provides a

detailed account of solar sailing, at a high technical level, but in a way accessible to the scientifically informed layperson. Solar sail orbital dynamics and solar radiation pressure form the foundations of the book, but the engineering design of solar sails is also considered, along with potential mission applications.

MODERN ASTRODYNAMICS

Elsevier In recent years, an unprecedented interest in novel and revolutionary space missions has risen out of the advanced NASA and ESA programs. Astrophysicists, astronomers, space systems engineers, mathematicians and scientists have been cooperating to implement novel and ground-breaking space missions. Recent progress in mathematical dynamics has enabled development of specialised spacecraft orbits and propulsion systems. Recently, the concept of flying spacecraft in formation has gained a lot of interest within the community. These progresses constitute the background to a significant renaissance of research dealing with astrodynamics and its applications. Modern Astrodynamics is designed as a stepping stone for the exposition of modern astrodynamics to students, researchers, engineers and scientists. This volume will present the main constituents of the astrodynamical science in an elaborate, comprehensive and rigorous manner. Although the volume will contain a few distinct chapters, it will render a coherent portrayal of astrodynamics. Encompasses the main constituents of the astrodynamical sciences in an elaborate, comprehensive and rigorous manner Presents recent astrodynamical advances and describes the challenges ahead The first volume of a series designed to give scientists and engineers worldwide an opportunity to publish their works in this multi-disciplinary field

FUNDAMENTALS OF CELESTIAL MECHANICS

PROGRESS IN ASTRONAUTICS AND AERONAUTICS

AN AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS SERIES

FUNDAMENTALS OF GLOBAL POSITIONING SYSTEM RECEIVERS

A SOFTWARE APPROACH

John Wiley & Sons All the expert guidance you need to understand, build, and operate GPS receivers The Second Edition of this acclaimed publication enables readers to understand and apply the complex operation principles of global positioning system (GPS)

receivers. Although GPS receivers are widely used in everyday life to aid in positioning and navigation, this is the only text that is devoted to complete coverage of their operation principles. The author, one of the foremost authorities in the GPS field, presents the material from a software receiver viewpoint, an approach that helps readers better understand operation and that reflects the forecasted integration of GPS receivers into such everyday devices as cellular telephones. Concentrating on civilian C/A code, the book provides the tools and information needed to understand and exploit all aspects of receiver technology as well as relevant navigation schemes: Overview of GPS basics and the constellation of satellites that comprise the GPS system Detailed examination of GPS signal structure, acquisition, and tracking Step-by-step presentation of the mathematical formulas for calculating a user's position Demonstration of the use of computer programs to run key equations Instructions for developing hardware to collect digitized data for a software GPS receiver Complete chapter demonstrating a GPS receiver following a signal flow to determine a user's position The Second Edition of this highly acclaimed text has been greatly expanded, including three new chapters: Acquisition of weak signals Tracking of weak signals GPS receiver related subjects Following the author's expert guidance and easy-to-follow style, engineers and scientists learn all that is needed to understand, build, and operate GPS receivers. The book's logical flow from basic concepts to applications makes it an excellent textbook for upper-level undergraduate and graduate students in electrical engineering, wireless communications, and computer science.

INTRODUCTION TO THERMODYNAMICS AND HEAT TRANSFER

McGraw-Hill Higher Education This text provides balanced coverage of the basic concepts of thermodynamics and heat transfer. Together with the illustrations, student-friendly writing style, and accessible math, this is an ideal text for an introductory thermal science course for non-mechanical engineering majors.

CELESTIAL MECHANICS AND ASTRODYNAMICS

Elsevier Celestial Mechanics and Astrodynamics

SPACE VEHICLE DESIGN

AIAA

ORBITAL DATA APPLICATIONS FOR SPACE OBJECTS

CONJUNCTION ASSESSMENT AND SITUATION ANALYSIS

Springer This book introduces readers to the application of orbital data on space objects in the contexts of conjunction assessment and space situation analysis, including theories and methodologies. It addresses the main topics involved in space object conjunction assessment, such as: orbital error analysis of space objects; close approach analysis; the calculation, analysis and application of collision probability; and the comprehensive assessment of collision risk. In addition, selected topics on space situation analysis are also presented, including orbital anomaly and space event analysis, and so on. The book offers a valuable guide for researchers and engineers in the fields of astrodynamics, space telemetry, tracking and command (TT&C), space surveillance, space situational awareness, and space debris, as well as for graduates majoring in flight vehicle design and related fields.

FUNDAMENTALS OF AEROSPACE ENGINEERING

(BEGINNER'S GUIDE)

Createspace Independent Publishing Platform Attention: This book requires no knowledge of math! During my career as an aerospace engineer, I have come to find that math is only one small prerequisite for being successful in the field - what's most important is passion. Aerospace engineering builds on several basic disciplines including mathematics, physics, chemistry, mechanics, electronics and communications. Even just a rudimentary understanding of these fields enables a more rapid and deep understanding of the advancements in aerospace engineering - whether you be an interested spectator or professional in the field, this is your textbook. Our real limits are far beyond our current perception and we will challenge them for many centuries to come. In aviation, we continuously seek to fly higher and faster - this book's purpose is to give you an idea of the engineering principles which enable powered flights, space exploration and much more. Although humans have envied the flight of birds for many thousands of years, the engineering of powered flight is just over 100 years old, having started with the 12-second, 120-foot flight of the Wright brothers in 1903. Over the years, aerospace progress has demanded the further development of existing technical fields or creation of new ones building on the above basic disciplines. You might be the one to design, engineer and manage the next generation of aircraft, spacecraft, or beyond! However, all of this will require understanding the big picture and having an understanding of where we came from. For that, you first need to understand, how a bird flies, or a signal is sent to space. It's an exciting time to be alive-enjoy! - Ed Gibson