Read Book Introduction To Solid Rocket Propulsion ame.americansamoa.gov

Read Book Introduction To Solid Rocket Propulsion ame.americansamoa.gov

Study on Algorithms for Prediction of Solid Propellant Rocket Motor Performance
Rocket Propulsion Elements and Materials in Rocket Propulsion Systems
Powered Flight
Modern Engineering for Design of Liquid-Propellant Rocket Engines
Rocket Propulsion Elements
Jet, Rocket, Nuclear, Ion and Electric Propulsion
Introduction to Rocket Propulsion
Optical Measurements on Solid Specimens of Solid Rocket Motor Exhaust and Solid Rocket Motor Slag
Fluidic Nozzle Throats in Solid Rocket Motors

The DEFINITIVE INTRODUCTION TO ROCKET PROPULSION THEORY AND APPLICATIONS
The recent upsurge in global government and private spending and in space activity has resulted in many novel applications of rocket propulsion technology. Rocket Propulsion Elements remains the definitive guide to the field, providing a comprehensive introduction to essential concepts and applications. Led by industry veteran George F. Cooper and by Professor Charles Hillyer, this broad-ranging third edition includes discussion and analysis of recent advances in the field, representing an authoritative reference for students and working engineers alike. In any engineering field, theory is only as useful as it is practical; this book emphasizes relevant real-world applications of fundamental concepts to link “thinking” and “doing.” This book will help readers: Understand the physics of rocket flight and the chemistry of solid-propellant rockets; Analyze the materials and structures used in rocket propulsion; Learn about the design and performance of rocket engines; Understand the principles of electrical and mechanical propulsion. The book provides interdisciplinary coverage including thermodynamics, aerodynamics, flight performance, propellant chemistry, and more. It thoroughly revised fifth edition includes 150 new and updated illustrations, and 340 figures and photographs, many appearing for the first time.

Modern Engineering for Design of Liquid-Propellant Rocket Engines

Fluidic Nozzle Throats in Solid Rocket Motors

Optical Measurements on Solid Specimens of Solid Rocket Motor Exhaust and Solid Rocket Motor Slag

THE DEFINITIVE INTRODUCTION TO ROCKET PROPULSION THEORY AND APPLICATIONS

The recent upsurge in global government and private spending and in space activity has resulted in many novel applications of rocket propulsion technology. Rocket Propulsion Elements remains the definitive guide to the field, providing a comprehensive introduction to essential concepts and applications. Led by industry veteran George F. Cooper and by Professor Charles Hillyer, this broad-ranging third edition includes discussion and analysis of recent advances in the field, representing an authoritative reference for students and working engineers alike. In any engineering field, theory is only as useful as it is practical; this book emphasizes relevant real-world applications of fundamental concepts to link “thinking” and “doing.” This book will help readers: Understand the physics of rocket flight and the chemistry of solid-propellant rockets; Analyze the materials and structures used in rocket propulsion; Learn about the design and performance of rocket engines; Understand the principles of electrical and mechanical propulsion. The book provides interdisciplinary coverage including thermodynamics, aerodynamics, flight performance, propellant chemistry, and more. It thoroughly revised fifth edition includes 150 new and updated illustrations, and 340 figures and photographs, many appearing for the first time.

Jet, Rocket, Nuclear, Ion and Electric Propulsion

Introduction to Rocket Propulsion

Fluidic Nozzle Throats in Solid Rocket Motors

Optical Measurements on Solid Specimens of Solid Rocket Motor Exhaust and Solid Rocket Motor Slag

THE DEFINITIVE INTRODUCTION TO ROCKET PROPULSION THEORY AND APPLICATIONS

The recent upsurge in global government and private spending and in space activity has resulted in many novel applications of rocket propulsion technology. Rocket Propulsion Elements remains the definitive guide to the field, providing a comprehensive introduction to essential concepts and applications. Led by industry veteran George F. Cooper and by Professor Charles Hillyer, this broad-ranging third edition includes discussion and analysis of recent advances in the field, representing an authoritative reference for students and working engineers alike. In any engineering field, theory is only as useful as it is practical; this book emphasizes relevant real-world applications of fundamental concepts to link “thinking” and “doing.” This book will help readers: Understand the physics of rocket flight and the chemistry of solid-propellant rockets; Analyze the materials and structures used in rocket propulsion; Learn about the design and performance of rocket engines; Understand the principles of electrical and mechanical propulsion. The book provides interdisciplinary coverage including thermodynamics, aerodynamics, flight performance, propellant chemistry, and more. It thoroughly revised fifth edition includes 150 new and updated illustrations, and 340 figures and photographs, many appearing for the first time.

Jet, Rocket, Nuclear, Ion and Electric Propulsion

Introduction to Rocket Propulsion

Fluidic Nozzle Throats in Solid Rocket Motors

Optical Measurements on Solid Specimens of Solid Rocket Motor Exhaust and Solid Rocket Motor Slag

THE DEFINITIVE INTRODUCTION TO ROCKET PROPULSION THEORY AND APPLICATIONS

The recent upsurge in global government and private spending and in space activity has resulted in many novel applications of rocket propulsion technology. Rocket Propulsion Elements remains the definitive guide to the field, providing a comprehensive introduction to essential concepts and applications. Led by industry veteran George F. Cooper and by Professor Charles Hillyer, this broad-ranging third edition includes discussion and analysis of recent advances in the field, representing an authoritative reference for students and working engineers alike. In any engineering field, theory is only as useful as it is practical; this book emphasizes relevant real-world applications of fundamental concepts to link “thinking” and “doing.” This book will help readers: Understand the physics of rocket flight and the chemistry of solid-propellant rockets; Analyze the materials and structures used in rocket propulsion; Learn about the design and performance of rocket engines; Understand the principles of electrical and mechanical propulsion. The book provides interdisciplinary coverage including thermodynamics, aerodynamics, flight performance, propellant chemistry, and more. It thoroughly revised fifth edition includes 150 new and updated illustrations, and 340 figures and photographs, many appearing for the first time.
Progress in Astronautics and Aeronautics. The revised edition of this practical, hands-on book discusses the launch vehicles in use today throughout the world, and includes the latest details on advanced systems being developed, such as electric and nuclear propulsion. The author covers the fundamentals, from the basic principles of rocket propulsion and vehicle dynamics through the theory and practice of liquid and solid propellant rockets, to new and future developments. It provides a serious exposition of the principles and practice of rocket propulsion, from the point of view of the user who is not an engineering specialist.

Rocket and Spacecraft Propulsion. This third edition of the classic on the thermochromical aspects of the combustion of propellants and explosives is completely revised and updated and now includes a section on green propellants and offers an up-to-date treatment of most of the current research and the outcomes of the corresponding basic research programs. Book II, dealing with the properties of propellants, is a self-contained volume, and the second part highlights applications of energetic materials, such as propellants, explosives and pyrotechnics, with a focus on the phenomena occurring in rocket motors. Finally, an appendix gives a brief overview of the fundamentals of aerothermodynamics, which is a prerequisite for the study of pyrotechnics. A detailed reference for readers interested in rocketry or explosives technology.

Solid Rocket Propulsion Technology. A modern pedagogical treatment of the latest industry trends in rocket propulsion, developed from the authors’ extensive experience in both industry and academia. Students are guided along a step-by-step journey through modern rocket propulsion, beginning with the historical context and an introduction to top-level performance measures, and progressing on to in-depth discussions of the chemical aspects of fluid flow combustion thermochemistry and chemical equilibrium, solid, liquid, and hybrid rocket propellants, mission requirements, and an overview of electric propulsion. With a wealth of homework problems (and a solutions manual for instructors online), real-life case studies and examples throughout, and an appendix detailing key numerical methods and links to additional online resources, this is a must-have guide for senior and first-year college students looking to gain a thorough understanding of the topic along with practical tools that can be applied in industry.

Solid Propellant Grain Structural Integrity Analysis. Theory of Aerospace propulsion. Second Edition, teaches engineering students how to utilize the fundamental principles of fluid mechanics and thermodynamics to analyze aircraft engines, understand the common gas turbine aircraft propulsion systems, be able to determine the applicability of each, perform system studies of aircraft engine systems for specified flight conditions and preliminary aerothermal design of turbomachinery components, and conceive, analyze, and optimize competing preliminary designs for conventional and unconventional missions. This edition has been fully revised, with new content, new examples and problems, and improved illustrations to better facilitate learning of key concepts. Includes broader coverage than that found in most other books, including coverage of propellers, nuclear rockets, and space propulsion to allows analysis and design of more types of propulsion systems. Provides in-depth, quantitative treatments of the components of jet propulsion engines, including the tools for evaluation and component matching for optimal system performance. Contains fully worked examples and progressively challenging end-of-chapter exercises that provide practice for analyzing specific propulsion systems and determining their suitability for different flight conditions.

Chemical Rocket Propulsion. This book provides a comprehensive basics-to-advanced course in an aerothermal science vital to the design of engines for either type of craft. The text classifies engines powering aircraft and single/multi-stage rockets, and derives performance parameters for both from basic aerodynamics and thermodynamics laws. Each type of engine is analyzed for optimum performance goals, and mission-appropriate engine selection is explained. Fundamentals of Aircraft and Rocket Propulsion provides information about and analyses of: thermodynamic cycles of shaft engines (piston, turboprop, turboshaft and propfan); jet engines (pulsejet, pulse detonation engine, ramjet, scramjet, turbojet and turbofan); chemical and non-chemical rocket engines; conceptual design of modular rocket engines (combustor, nozzle and turbopump); and conceptual design of different modules of rocket- engines in their design and off-design state. Aided at graduate and final-year undergraduate students, this textbook provides a thorough grounding in the history and classification of both aircraft and rocket engines, important design features of all the engines detailed, and particular consideration of special aircraft such as unmanned aerial vehicles and vertical takeoff and landing. The book is illustrated throughout with an excellent end-of-chapter exercise set that provides practice for analyzing specific propulsion systems and determining their suitability for different flight conditions.

Principles of Rocket Propulsion. Gears toward advanced undergraduates and graduate students, this text develops the concepts of electrical acceleration of gases for propulsion, from primary physical principles to realistic space thruster designs. 1988 edition.

From Earth to Orbit. Principles of Nuclear Rocket Propulsion has been updated and expanded from the work presented at the New Energetic Materials and Propulsion Techniques for Space Exploration workshop in June 2014, this book contains new scientific results, up-to-date reviews, and inspiring perspectives in a number of areas related to the energetic aspects of chemical rocket propulsion. This collection covers the entire life of energetic materials from their conceptual formulation to practical manufacturing; it includes coverage of theoretical and experimental ballistics, performance properties, as well as laboratory-scale and full system-scale, handling, hazards, environment, aging, and disposal. Chemical Rocket Propulsion is a unique work, where a selection of accomplished experts from the pioneering era of space propulsion and current technologists from the most advanced international laboratories discuss the future of chemical rocket propulsion for access to, and exploration of, space. It will be of interest to both postgraduate and final-year undergraduate students in aerospace engineering, and practicing aeronautical engineers and designers, especially those with an interest in propulsion, as well as researchers in energetic materials.

A Review of United States Air Force and Department of Defense Aerospace Propulsion Needs. Blasting the Trail Rocket and air-breathing propulsion systems are the foundation on which future space systems are built. A Review of United States Air Force and Department of Defense Aerospace Propulsion Needs assesses the existing technical base in these areas and examines the Future Air Force capabilities the base will be expected to support. This report also defines gaps and recommends where future warfighter capabilities not yet fully defined could be met by current science and technology development plans.


Rocket Propulsion Elements. Aerothermodynamics of Gas Turbine and Rocket Propulsion. This book focuses on the performance and application of fluid nozzle throats for solid rocket motors, discussing their flow details and characteristics performance, as well as the influence of the particle phase on the performance and design. It covers a range of fluid nozzle throats in solid rocket motors and is richly illustrated with impressive figures and full-color photographs. It is a valuable resource for students and researchers in the fields of aeronautics, astronautics and related industries wishing to understand the fundamentals and theories of fluidic nozzle throats and engage in fluidic nozzle throat analysis and design.

An Introduction to Rocket missile Propulsion. Developed and expanded from the work presented at the New Energetic Materials and Propulsion Techniques for Space Exploration workshop in June 2014, this book contains new scientific results, up-to-date reviews, and inspiring perspectives in a number of areas related to the energetic aspects of chemical rocket propulsion. This collection covers the entire life of energetic materials from their conceptual formulation to practical manufacturing; it includes coverage of theoretical and experimental ballistics, performance properties, as well as laboratory-scale and full system-scale, handling, hazards, environment, aging, and disposal. Chemical Rocket Propulsion is a unique work, where a selection of accomplished experts from the pioneering era of space propulsion and current technologists from the most advanced international laboratories discuss the future of chemical rocket propulsion for access to, and exploration of, space.
Rocket Propulsion During the last decade, rapid growth of knowledge in the field of jet, rocket, nuclear, ion and electric propulsion has resulted in many advances useful to the student, engineer and scientist. The purpose for offering this course is to make available to them these recent advances in theory and design. Accordingly, this course is organized into seven parts: Part 1 Introduction; Part 2 Jet Propulsion; Part 3 Rocket Propulsion; Part 4 Nuclear Propulsion; Part 5 Electric and Ion Propulsion; Part 6 Theory on Combustion, Detonation and Fluid Injection; Part 7 Advanced Concepts and Mission Applications. It is written in such a way that it may easily be adopted by other universities as a textbook for a one semester senior or graduate course on the subject. In addition to the undersigned who served as the course instructor and wrote Chapter I, 2 and 3, guest lecturers included: DR. G. L. DUGGER who wrote Chapter 4 "Ram-jets and Air-Augmented Rockets," DR. GEORGE P. SOTTON who wrote Chapter 5 "Rockets and Cooling Methods," DR. MARTIN SUMMERFIELD who wrote Chapter 6 "Gasco Nuclear Rockets," DR. R. B. RODEN who wrote Chapter 7 "Electric and Ion Propulsion," DR. HOWARD S. SEIFERT who wrote Chapter 8 "Hybrid Rockets," DR. CHANDLER C. Roos who wrote Chapter 9 "Nuclear Rocket Design," MR. GEORGE H. McLAFFERTY who wrote Chapter 10 "Gaseous Nuclear Rockets," DR. S. G. FORBES who wrote Chapter 11 "Electric and Ion Propulsion," DR. C. Captive-fired Testing of Solid Rocket Motors

Solid Propellant Rocket Research This article introduces two predictive algorithms for the performance of solid propellant rocket motor. The emphasis is on the introduction of Time-Space Algorithm. The authors proposed a general two-dimensional grain calculation procedure in order to conduct the grain calculations. Therefore, the predictive algorithms for performance introduced by this article show generality. A comprehensive computer program for the aforementioned method has been written and applied to calculating the performance of these different solid rocket motors. The calculated results are consistent with those derived from experimental data.

Theory of Aerospace Propulsion Concentrates on the subject of rocket propulsion, its basic technology, performance and design rationale. Provides an introduction to the subject, an understanding of basic principles, a description of their physical mechanisms and designs, and an understanding of the application of rocket propulsion to flying vehicles.

Propellants and Explosives This book deals with the fundamental aspects of rockets and the current trends in rocket propulsion. The book starts with a description of motion in space, the requirements of rockets for placing spacecrafts in different orbits about the Earth and escape.

Solid Propellant Chemistry Combustion and Motor Interior Ballistics 1999

Fundamental Concepts of Liquid-Propellant Rocket Engines

Fundamentals of Aircraft and Rocket Propulsion Nanomaterials in Rocket Propulsion Systems covers the fundamentals of nanomaterials and examines a wide range of innovative applications, presenting the current state-of-the-art in the field. Opening with a chapter on nano-sized energetic materials, the book examines metal nanoparticles-based fuels, ballistic modifiers, stabilizers and catalysts as the components of rocket propellants. Hydrogen storage materials for rocket propulsion based on nanotubes are then discussed, as are nano-porous materials and metal organic frameworks. Other applications examined include high thermal conductivity metallic nano-composite nozzle liners, nano-emitters for Coldcomb propulsion of space-crafts, and highly thermoset nanoceramics for rocket motors. The book finishes with coverage of combustion of nano-sized rocket fuels, nano-particles and their combustion in micro- and nano-electromechanical systems (MEMS/NEMS), plasma propulsion and nano-scale physics. Users will find this to be a valuable resource for academic and government institutions, professionals, new researchers and graduate students working in the application of nanomaterials in the aerospace industry. Provides a detailed overview of different types of nanomaterials used in rocket propulsion, highlighting different situations in which different materials are used Demonstrates the use of new nanomaterial concepts, allowing for an increase in payload capacity or a decrease in launch mass Explores a range of applications using metal nanoparticles, presenting a panacea on cutting-edge, technological developments

Fundamentals of Rocket Propulsion

Ignition! If the United States hopes to continue as a leader in space, it must invest now in better earth-to-orbit technology by replacing obsolete launch facilities while also developing a new class of more robust and reliable vehicles. From Earth to Orbit provides strategies to reduce launch costs while increasing the reliability and resiliency of vehicles. It also recommends continued improvements for the Space Shuttle Orbiter and its subsystems and the development of a Space Transportation Main Engine (STME).