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Young, Munson and Okiishi's A Brief Introduction to Fluid Mechanics Cambridge University Press

Textbook introducing the fundamentals of aircraft performance using industry standards and examples: bridging the gap between academia and industry Provides an extensive and detailed treatment of all segments of mission profile and overall aircraft performance Considers operating costs, safety, environmental and related systems issues Includes worked examples relating to current aircraft (Learjet 45, Tucano Turboprop Trainer, Advanced Jet Trainer and Airbus A320 types of aircraft) Suitable as a textbook for aircraft performance courses

Aircraft Propulsion John Wiley & Sons
This book is based on the 55th International Conference of Machine Design Departments 2014 (ICMD 2014) which was hosted by the

Czech Technical University in September 2014.

It features scientific articles which solve progressive themes from the field of machine design. The book addresses a broad range of themes including tribology, hydraulics, materials science, product innovation and experimental methods. It presents the latest interdisciplinary high-tech work. People with an interest in the latest research results in the field of machine design and manufacturing engineering will value this book with contributions of leading academic scientists and experts from all around the world.

Proceedings of Fatigue Durability India 2019 John Wiley & Sons

The German R+D program "Solares Testzentrum Almeria" (SOTA) provides the scientific basis for the realization of advanced solar technologies including facility modifications, component tests and new lines of development. One of the working packages, WP 300, addresses the "Scientific Support" by the performance of preparatory studies,

exploratory laboratory activities and qualified expertise. Universities, Research Institutes and Company R + D Entities in Germany are enabled to treat the following aspects: - Meteorological, system and cost investigations, - Development of important components as concentrator, receiver, storage, - Utilization of solar energy for process heat and chemical reactions. In 1988 and 1989 the studies concentrated on the development of components. The reports of the activities were finalized recently and collected in the present volumes. The final reports were printed as received under the responsibility of the authors.

An Exploration of Gas Turbine Performance Modeling Prentice Hall

This book provides a comprehensive basics-to-advanced course in an aero-thermal 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 engines 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 turbopumps); and conceptual design of different modules of aero-engines in their design and off-

design state. Aimed 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 and short/vertical takeoff and landing aircraft. End-of-chapter exercises make this a valuable student resource, and the provision of a downloadable solutions manual will be of further benefit for course instructors.

Solar Thermal Energy Utilization John Wiley & Sons

This book presents new studies in the area of turbomachine mathematical modeling with a focus on models applied to developing engine control and diagnostic systems. The book contains one introductory and four main chapters. The introductory chapter describes the area of modeling of gas and wind turbines and shows the demand for further improvement of the models. The first three main chapters offer particular improvements in gas turbine modeling. First, a novel methodology for the modeling of engine starting is presented. Second, a thorough theoretical comparative analysis is performed for the models of engine internal gas capacities, and practical recommendations are given on model applications, in particular for engine control purposes. Third, multiple algorithms for calculating important unmeasured parameters for engine diagnostics are proposed and compared. It is proven that the best algorithms allow accurate prognosis of engine remaining lifetime. The field of wind turbine modeling is presented in the last main chapter. It introduces a general-purpose model that describes both aerodynamic and electric parts of a wind power plant. Such a detailed physics-based model will help with the development of more accurate control and diagnostic systems. In this way, this book includes four new studies in the area of gas and wind turbine modeling. These studies will be interesting and useful for specialists in turbine engine control and diagnostics.

Using Artificial Neural Networks John Wiley & Sons

When the First Edition of this book was written in 1951, the gas turbine was just

becoming established as a powerplant for military aircraft. It took another decade before the gas turbine was introduced to civil aircraft, and this market developed so rapidly that the passenger liner was rendered obsolete. Other markets like naval propulsion, pipeline compression and electrical power applications grew steadily. In recent years the gas turbine, in combination with the steam turbine, has played an ever-increasing role in power generation. Despite the rapid advances in both output and efficiency, the basic theory of the gas turbine has remained unchanged. The layout of this new edition is broadly similar to the original, but greatly expanded and updated, comprising an outline of the basic theory, aerodynamic design of individual components, and the prediction of off-design performance. The addition of a chapter devoted to the mechanical design of gas turbines greatly enhances the scope of the book. Descriptions of engine developments and current markets make this book useful to both students and practising engineers.

Basic Concepts in Turbomachinery MIT Press

The second edition of a comprehensive textbook that introduces turbomachinery and gas turbines through design methods and examples. This comprehensive textbook is unique in its design-focused approach to turbomachinery and gas turbines. It offers students and practicing engineers methods for configuring these machines to perform with the highest possible efficiency. Examples and problems are based on the actual design of turbomachinery and turbines. After an introductory chapter that outlines the goals of the book and provides definitions of terms and parts, the book offers a brief review of the basic principles of thermodynamics and efficiency definitions. The rest of the book is devoted to the analysis and design of real turbomachinery configurations and gas turbines, based on a consistent application of thermodynamic theory and a more empirical

treatment of fluid dynamics that relies on the extensive use of design charts. Topics include turbine power cycles, diffusion and diffusers, the analysis and design of three-dimensional free-stream flow, and combustion systems and combustion calculations. The second edition updates every chapter, adding material on subjects that include flow correlations, energy transfer in turbomachines, and three-dimensional design. A solutions manual is available for instructors. This new MIT Press edition makes a popular text available again, with corrections and some updates, to a wide audience of students, professors, and professionals.

Fluid Mechanics and Fluid Power –

Contemporary Research Springer Nature

Although the overall appearance of modern airliners has not changed a lot since the introduction of jetliners in the 1950s, their safety, efficiency and environmental friendliness have improved considerably. Main contributors to this have been gas turbine engine technology, advanced materials, computational aerodynamics, advanced structural analysis and on-board systems. Since aircraft design became a highly multidisciplinary activity, the development of multidisciplinary optimization (MDO) has become a popular new discipline. Despite this, the application of MDO during the conceptual design phase is not yet widespread. *Advanced Aircraft Design: Conceptual Design, Analysis and Optimization of Subsonic Civil Airplanes* presents a quasi-analytical optimization approach based on a concise set of sizing equations. Objectives are aerodynamic efficiency, mission fuel, empty weight and maximum takeoff weight. Independent design variables studied include design cruise altitude, wing area and span and thrust or power loading. Principal features of integrated concepts such as the blended wing and body and highly non-planar wings are also covered. The quasi-

analytical approach enables designers to compare the results of high-fidelity MDO optimization with lower-fidelity methods which need far less computational effort. Another advantage to this approach is that it can provide answers to “ what if ” questions rapidly and with little computational cost. Key features: Presents a new fundamental vision on conceptual airplane design optimization Provides an overview of advanced technologies for propulsion and reducing aerodynamic drag Offers insight into the derivation of design sensitivity information Emphasizes design based on first principles Considers pros and cons of innovative configurations Reconsiders optimum cruise performance at transonic Mach numbers Advanced Aircraft Design: Conceptual Design, Analysis and Optimization of Subsonic Civil Airplanes advances understanding of the initial optimization of civil airplanes and is a must-have reference for aerospace engineering students, applied researchers, aircraft design engineers and analysts.

Industrial Gas Turbines Springer

Aircraft Design explores fixed winged aircraft design at the conceptual phase of a project. Designing an aircraft is a complex multifaceted process embracing many technical challenges in a multidisciplinary environment. By definition, the topic requires intelligent use of aerodynamic knowledge to configure aircraft geometry suited specifically to the customer's demands. It involves estimating aircraft weight and drag and computing the available thrust from the engine. The methodology shown here includes formal sizing of the aircraft, engine matching, and substantiating performance to comply with the customer's demands and government

regulatory standards. Associated topics include safety issues, environmental issues, material choice, structural layout, understanding flight deck, avionics, and systems (for both civilian and military aircraft). Cost estimation and manufacturing considerations are also discussed. The chapters are arranged to optimize understanding of industrial approaches to aircraft design methodology. Example exercises from the author's industrial experience dealing with a typical aircraft design are included.

11th International Symposium on Process Systems Engineering - PSE2012 John Wiley & Sons Reflecting the developments in gas turbine combustion technology that have occurred in the last decade, Gas Turbine Combustion: Alternative Fuels and Emissions, Third Edition provides an up-to-date design manual and research reference on the design, manufacture, and operation of gas turbine combustors in applications ranging from aeronautical to power generation. Essentially self-contained, the book only requires a moderate amount of prior knowledge of physics and chemistry. In response to the fluctuating cost and environmental effects of petroleum fuel, this third edition includes a new chapter on alternative fuels. This chapter presents the physical and chemical properties of conventional (petroleum-based) liquid and gaseous fuels for gas turbines; reviews the properties of alternative (synthetic) fuels and conventional-alternative fuel blends; and describes the influence of these different fuels and their blends on combustor performance, design, and emissions. It also discusses the special requirements of aircraft fuels and the problems encountered with fuels for industrial gas turbines. In the updated chapter on emissions, the authors highlight the quest for higher fuel efficiency and reducing carbon dioxide emissions as well as the regulations involved. Continuing to offer detailed coverage of multifuel capabilities, flame flashback, high off-design combustion efficiency, and liner failure studies, this best-selling book is the premier guide to gas turbine combustion technology. This edition retains the style that made its predecessors so

popular while updating the material to reflect the technology of the twenty-first century.

Select Proceedings of ICAMME 2021 Springer Science & Business Media

Knowledge is not merely everything we have come to know, but also ideas we have pondered long enough to know in which way they are related, and how these ideas can be put to practical use.

Modern aviation has been made possible as a result of much scientific research. However, the very first useful results of this research became available a considerable length of time after the aviation pioneers had made their first flights. Apparently, researchers were not able to find an adequate explanation for the occurrence of lift until the beginning of the 21st century. Also, for the fundamentals of stability and control, there was no theory available that the pioneers could rely on. Only after the first motorized flights had been successfully made did researchers become more interested in the science of aviation, which from then on began to take shape. In modern day life, many millions of passengers are transported every year by air. People in the western societies take to the skies, on average, several times a year. Especially in areas surrounding busy airports, travel by plane has been on the rise since the end of the Second World War. Despite becoming familiar with the sight of a jumbo jet commencing its flight once or twice a day, many find it astonishing that such a colossus with a mass of several hundred thousands of kilograms can actually lift off from the ground.

Gas Turbines for Electric Power Generation
CRC Press

Whereas other books in this area stick to the theory, this book shows the reader how to apply the theory to real engines. It provides access to up-to-date perspectives in the use of a variety of modern advanced control techniques to gas turbine technology.

Gas Turbine Theory BoD – Books on Demand

This book gathers the best articles presented by researchers and industrial experts at the International Conference on “ Innovative Design, Analysis and Development Practices in Aerospace and Automotive

Engineering (I-DAD 2020) ” . The papers discuss new design concepts, and analysis and manufacturing technologies, with a focus on achieving improved performance by downsizing; improving the strength-to-weight ratio, fuel efficiency and operational capability at room and elevated temperatures; reducing wear and tear; addressing NVH aspects, while balancing the challenges of Euro VI/Bharat Stage VI emission norms, greenhouse effects and recyclable materials. Presenting innovative methods, this book is a valuable reference resource for professionals at educational and research organizations, as well as in industry, encouraging them to pursue challenging projects of mutual interest.

Fundamentals of Propulsion BoD – Books on Demand

Major changes in gas turbine design, especially in the design and complexity of engine control systems, have led to the need for an up to date, systems-oriented treatment of gas turbine propulsion. Pulling together all of the systems and subsystems associated with gas turbine engines in aircraft and marine applications, Gas Turbine Propulsion Systems discusses the latest developments in the field. Chapters include aircraft engine systems functional overview, marine propulsion systems, fuel control and power management systems, engine lubrication and scavenging systems, nacelle and ancillary systems, engine certification, unique engine systems and future developments in gas turbine propulsion systems. The authors also present examples of specific engines and applications. Written from a wholly practical perspective by two authors with long careers in the gas turbine & fuel systems industries, Gas Turbine Propulsion Systems provides an excellent resource for project and program managers in the gas turbine engine community, the aircraft OEM community, and tier 1 equipment suppliers in Europe and the United States. It

also offers a useful reference for students and researchers in aerospace engineering.

Identification, Simulation, Condition Monitoring and Optimal Control Cambridge University Press

This book presents selected papers presented during Fatigue Durability India 2019. The contents of this volume discuss advances in the field of fatigue, durability, and fracture, and cover mechanical failure and its applications. The chapters cover a wide spectrum of topics, including design, engineering, testing and computational evaluation of the components or systems for fatigue, durability, and fracture mechanics. The contents of this book will appeal not only to academic researchers, but also to design engineers, failure analysts, maintenance engineers, certification personnel, and R&D professionals involved in a wide variety of industries.

Fatigue, Durability, and Fracture Mechanics
Gas Turbine Theory

This book is designed to cover the standard topics in a basic fluid mechanics course in a streamlined manner that meets the learning needs of students better than the dense, encyclopedic manner of traditional texts. This approach helps students connect the math and theory to the physical world and practical applications and apply these connections to solving problems. The text lucidly presents basic analysis techniques and addresses practical concerns and applications, such as pipe flow, open-channel flow, flow measurement, and drag and lift. It offers a strong visual approach with photos, illustrations, and videos included in the text, examples and homework problems to emphasize the practical application of fluid mechanics principles

Advanced Aircraft Design Elsevier

Aircraft Propulsion and Gas Turbine

Engines, Second Edition builds upon the success of the book 's first edition, with the addition of three major topic areas: Piston Engines with integrated propeller coverage; Pump Technologies; and Rocket Propulsion. The rocket propulsion section

extends the text 's coverage so that both Aerospace and Aeronautical topics can be studied and compared. Numerous updates have been made to reflect the latest advances in turbine engines, fuels, and combustion. The text is now divided into three parts, the first two devoted to air breathing engines, and the third covering non-air breathing or rocket engines.

Proceedings of I-DAD 2020 Springer Science & Business Media

Aerospace Propulsion Systems is a unique book focusing on each type of propulsion system commonly used in aerospace vehicles today: rockets, piston aero engines, gas turbine engines, ramjets, and scramjets. Dr. Thomas A. Ward introduces each system in detail, imparting an understanding of basic engineering principles, describing key functionality mechanisms used in past and modern designs, and provides guidelines for student design projects. With a balance of theory, fundamental performance analysis, and design, the book is specifically targeted to students or professionals who are new to the field and is arranged in an intuitive, systematic format to enhance learning. Covers all engine types, including piston aero engines Design principles presented in historical order for progressive understanding Focuses on major elements to avoid overwhelming or confusing readers Presents example systems from the US, the UK, Germany, Russia, Europe, China, Japan, and India Richly illustrated with detailed photographs Cartoon panels present the subject in an interesting, easy-to-understand way Contains carefully constructed problems (with a solution manual available to the educator) Lecture slides and additional problem sets for instructor use Advanced undergraduate students, graduate students and engineering professionals new to the area of propulsion will find Aerospace Propulsion Systems a highly accessible guide to grasping the key essentials. Field experts will also find that the book is a

very useful resource for explaining propulsion issues or technology to engineers, technicians, businessmen, or policy makers. Post-graduates involved in multi-disciplinary research or anybody interested in learning more about spacecraft, aircraft, or engineering would find this book to be a helpful reference. Lecture materials for instructors available at www.wiley.com/go/wardaero

Engineering Failure Analysis John Wiley & Sons

A comprehensive introduction to turbomachines and their applications With up-to-date coverage of all types of turbomachinery for students and practitioners, *Fundamentals of Turbomachinery* covers machines from gas, steam, wind, and hydraulic turbines to simple pumps, fans, blowers, and compressors used throughout industry. After reviewing the history of turbomachinery and the fluid mechanical principles involved in their design and operation, the book focuses on the application and selection of machines for various uses, teaching basic theory as well as how to select the right machine for a specific use. With a practical emphasis on engineering applications of turbomachines, this book discusses the full range of both turbines and pumping devices. For each type, the author explains: * Basic principles * Preliminary design procedure * Ideal performance characteristics * Actual performance curves published by the manufacturers * Application and appropriate selection of the machine Throughout, worked sample problems illustrate the principles discussed and end-of-chapter problems, employing both SI and the English system of units, provide practice to help solidify the reader's grasp of the material.

Advancement in Materials, Manufacturing and Energy Engineering, Vol. II Springer Science & Business Media

"In recent years the gas turbine, in combination with the steam turbine, has played an ever-increasing role in power generation. Despite the rapid advances in both output and efficiency, the basic theory of the gas turbine has remained unchanged. The layout of this new edition is broadly

similar to the original, but greatly expanded and updated, comprising an outline of the basic theory, aerodynamic design of individual components, and the prediction of off-design performance. The addition of a chapter devoted to the mechanical design of gas turbines greatly enhances the scope of the book."--Publisher's website.