Gas Turbine Engineering

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Fundamentals, Applictions and Cycles Elsevier

Gas Turbine Operations is a comprehensive introduction and reference for those approaching gas turbine engineering for the first time. Just as in Meherwan Boyce ' s classic Gas Turbine Engineering Handbook, the author draws on unrivalled practical experience to lead the reader through crucial theory and background information before introducing the essentials of gas turbine technology and operation. This is the best place for gas turbine professionals and students to find up-to-date legislation and emerging topics, and an ideal resource to gain a better understanding of the underlying principles of gas turbine operation. For further details on gas turbines, see Boyce ' s companion book Gas Turbine Operations and Maintenance. Provides the theory and background information needed by those new to gas turbine engineering Presents a fully updated and comprehensive list of the mechanical performance standards for turbines Explains brand new applications for combined Brayton and Rankine cycles and steam turbine technology Includes hard-won information from industry experts in the form of case studies

Sawyer's Gas Turbine Engineering Handbook: Theory & design Pearson Education

This book covers the design, analysis, and optimization of the cleanest, most efficient fossil fuel-fired electric power generation technology at present and in the foreseeable future. The book contains a wealth of first principles-based calculation methods comprising key formulae, charts, rules of thumb, and other tools developed by the author over the course of 25+ years spent in the power generation industry. It is focused exclusively on actual power plant systems and actual field and/or rating data providing a comprehensive picture of the gas turbine combined cycle technology from performance and cost perspectives. Material presented in this book is applicable for research and development studies in academia and government/industry laboratories, as well as practical, day-to-day problems encountered in the industry (including OEMs, consulting engineers and plant operators).

With Special Reference to Aircraft Propulsion MIT Press

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.

Principles and Theory of Gas Turbine Engines Walter de Gruyter GmbH & Co KG

Presents the fundamentals of the gas turbine engine, including cycles, components, component matching, and environmental considerations.

Theory and Design Cambridge University 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.

Gas Turbine Theory CRC Press
Full text engineering e-book.
Gas Turbine Theory AuthorHouse
Primarily this book describes the thermodynamics of gas turbine cycles. The search for high gas turbine efficiency has produced many variations on the simple "open circuit" plant, involving the use of heat exchangers, reheating and intercooling, water and steam injection, cogeneration and combined cycle plants. These are described fully in the text. A review of recent proposals for a number of novel gas turbine cycles is also included. In the past few years work has been directed towards developing gas turbines which produce less carbon dioxide, or plants from which the CO2 can be disposed of; the implications of a carbon tax on electricity pricing are considered. In presenting this wide survey of gas turbine cycles for power generation the author calls on both his academic experience (at Cambridge and Liverpool Universities, the Gas Turbine Laboratory at MIT and Penn State University) and his industrial work (primarily with Rolls Royce, plc.) The book will be essential reading for final year and masters students in mechanical engineering, and for practising engineers.
Ill MIT Press
Basics of Gas Turbines is a comprehensive introduction and reference for those approaching gas turbine engineering for the first time. Just as in Meherwan Boyce’s classic, the author draws on unrivalled practical experience to lead the reader through crucial theory and background information before introducing the essentials of gas turbine technology and operation. This is the best place for gas turbine professionals and students to find up-to-date legislation and emerging topics, and to get a basic understanding of the underlying principles of gas turbine operation. In addition, the book's companion, Gas Turbine Operations will be an ideal reference for an all-around understanding. Includes the theory and background information needed by those new to gas turbine engineering Contains a fully updated and comprehensive list of the mechanical performance standards for turbines Explains new applications for combined Brayton and Rankine cycles and steam turbine technology Presents hard-won information from industry experts in the form of case studies
Principles and Practices Butterworth-Heinemann
Gas Turbine Engineering HandbookElsevier
Applications, Cycles, and Characteristics Elsevier
For the first time simplified methods of dealing with gas turbine thermal cycles, and further theoretical innovations, have been embodied into a concise textbook. All the major aspects of the subject are covered in a comprehensive and lucid manner. Examples are included for greater clarity
Advanced Technologies for Gas Turbines John Wiley & Sons Incorporated
Pounder’s Marine Diesel Engines and Gas Turbines, Tenth Edition, gives engineering cadets, marine engineers, ship operators and managers insights into currently available engines and auxiliary equipment and trends for the future. This new edition introduces new engine models that will be most commonly installed in ships over the next decade, as well as the latest legislation and pollutant emissions procedures. Since publication of the last edition in 2009, a number of emission control areas (ECAs) have been established by the International Maritime Organization (IMO) in which exhaust emissions are subject to even more stringent controls. In addition, there are now rules that affect new ships and their emission of CO2 measured as a product of cargo carried. Provides the latest emission control technologies, such as SCR and water scrubbers Contains complete updates of legislation and pollutant emission procedures Includes the latest emission control technologies and expands upon remote monitoring and control of engines
The Gas Turbine Handbook Butterworth-Heinemann
Naval Engineering: Principles and Theory of Gas Turbine Engines is a technical publication for professional engineers to assist in understanding the history and development of gas turbine engines including the thermodynamic processes known as the Brayton cycle. Common principles of various gas turbine nomenclatures, technical designs, applications, and performance conditions that affect the capabilities and limitations of marine operations are provided. It enables the ability to describe the principal components of gas turbines and their construction. This book will enable the reader to increase professional knowledge through the understanding of navy engineering principles and theory of gas turbine engines. The reader will learn the operation and maintenance of the gas turbine modules (GTMs), gas turbine generators (GTGs), reduction gears, and associated equipment such as pumps, valves, oil purifiers, heat exchangers, shafts, and shaft bearings. Inside this book, you will find technical information such as electronic control circuitry, interfaces such as signal conditioners, control consoles, and designated electrical equipment associated with shipboard propulsion and electrical powergenerating plants. When every detail of engineering work is performed with integrity and reliability, technical leadership know-how will improve.
High Efficiency, Low Emission, Fuel Flexible Power Generation AuthorHouse
This book written by a world-renowned expert with more than forty years of active gas turbine R&D experience comprehensively treats the design of gas turbine components and their integration into a complete system. Unlike many currently available gas turbine handbooks that provide the reader with an overview without in-depth treatment of the subject, the current book is concentrated on a detailed aero-thermodynamics, design and off-deign performance aspects of individual components as well as the system integration and its dynamic operation.This new book provides practicing gas turbine designers and young engineers working in the industry with design material that the manufacturers would keep proprietary. The book is also intended to provide instructors of turbomachinery courses around the world with a powerful tool to assign gas turbine components as project and individual modules that are integrated into a complete system. Quoting many statements by the gas turbine industry professionals, the young engineers graduated from the turbomachinery courses offered by the author, had the competency of engineers equivalent to three to four years of industrial experience.
Gas Turbine Operations Springer
Leadership in gas turbine technologies is of continuing importance as the value of gas turbine production is projected to grow substantially by 2030 and beyond. Power generation, aviation, and the oil and gas industries rely on advanced technologies for gas turbines. Market trends including world demographics, energy security and resilience, decarbonization, and customer profiles are rapidly changing and influencing the future of these industries and gas turbine technologies. Technology trends that define the technological environment in which gas turbine research and development will take place are also changing - including inexpensive, large scale computational capabilities, highly autonomous systems, additive manufacturing, and cybersecurity. It is important to evaluate how these changes influence the gas turbine industry and how to manage these changes moving forward. Advanced Technologies for Gas Turbines identifies high-priority opportunities for improving and creating advanced technologies that can be introduced into the design and manufacture of gas turbines to enhance their performance. The goals of this report are to assess the 2030 gas turbine global landscape via analysis of global leadership, market trends, and technology trends that impact gas turbine applications, develop a prioritization process, define high-priority research goals, identify high-priority research areas and topics to achieve the specified goals, and direct future research. Findings and

recommendations from this report are important in guiding research within the gas turbine industry and advancing electrical power generation, commercial and military aviation, and oil and gas production.

Gas Turbine Combined Cycle Power Plants Elsevier

Gas turbine engineering handbook focuses on the design, fabrication, installation, operation, and maintenance of gas turbines. The third edition is not only an updating of the technology in gas turbines, which has seen a great leap forward in the 2000s, but also a rewriting of various sections to better answer today's problems in the design, fabrication, installation, operation, and maintenance of gas turbines. The third edition has added a new chapter that examines the case histories of gas turbines from deterioration of the performance of gas turbines to failures encountered in all the major components of the gas turbine.

Naval Mechanical Engineering The Fairmont Press, Inc.

Naval Mechanical Engineering: Gas Turbine Propulsion, Auxiliary, and Engineering Support Systems is a technical publication for professional engineers to assist in understanding various ships auxiliary systems. You will learn how they are applied to the overall propulsion plant and how the pumps and valves are used in the systems. Since the auxiliary systems vary between ship types, you will learn the systems in general terms. The maintenance and upkeep of the auxiliary systems are extremely important since, without them, the main engines would not be able to operate. You will be presented with some of the various factors that affect gas turbine performance, procedures for engine changeout, and power train inspection. In conclusion, you will learn a few of the maintenance, operating problems, and repair of pneumatic systems, low-pressure air compressors (LPAC), hydraulic systems, pumps, valves, heat exchangers, and purifiers. Proper maintenance or repair work consists of problem diagnosis, disassembly, measurements, corrections of problems, and reassembly. Use of proper tools, knowledge of the construction of equipment, proper work site management, and cleanliness are keys to successful maintenance and repair work.

Theory & design Elsevier

This book tells the story of the power generation gas turbine from the perspective of one of the leading companies in the field over a period of nearly 100 years, written by an engineer. Especially in times of imminent global economic crises it appears to be worthwhile to reflect on real economic values based on engineering ingenuity and enduring management of technological leadership. Though the book is primarily designed as a technical history of the BBC/ABB/Alstom power generation gas turbines, its scope is sufficiently broad to cover general development trends, including parallel competitor activities. A special benefit is the historical breakdown to the gas turbine component level, so that the book actually outlines the development of axial compressors from early beginnings, the progress in combustion technology towards extraordinary low emission values and that of axial turbines with special emphasis on early turbine cooling innovations. The sheer length of certain engineering developments over several decades allows interesting historic observations and deductions on inherent business mechanisms, the effects of technology preparations and organisational consequences. A look into the mirror of the past provides revelations on the impact of far-reaching business decisions. 2017 Winner of the Historian Engineer Award of the ASME (American Society of Mechanical Engineers

The Gas Turbine Engineering Handbook Elsevier

Primarily this book describes the thermodynamics of gas turbine cycles. The search for high gas turbine efficiency has produced many variations on the simple "open circuit" plant, involving the use of heat exchangers, reheating and intercooling, water and steam injection, cogeneration and combined cycle plants. These are described fully in the text. A review of recent proposals for a number of novel gas turbine cycles is also included. In the past few years work has been directed towards developing gas turbines which produce less carbon dioxide, or plants from which the CO2 can be disposed of; the implications of a carbon tax on electricity pricing are considered. In presenting this wide survey of gas turbine cycles for power generation the author calls on both his academic experience (at Cambridge and Liverpool Universities, the Gas Turbine Laboratory at MIT and Penn State University) and his industrial work (primarily with Rolls Royce, plc.) The book will be essential reading for final year and masters students in mechanical engineering, and for practising engineers.

Editor, John W. Sawyer Halsted Press

Gas Turbine Theory, 5th edition HIH Saravanamuttoo, GFC Rogers, H Cohen When the First Edition of this book was written fifty years ago, 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 ocean 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. Descriptions of engine developments and current markets make this book useful to both students and practising engineers. FEATURES: - completely updated to cover current industry requirements and applications - coverage of both aircraft and industrial gas turbines - includes detailed treatment of off-design performance - incorporates in-depth examples throughout - based on the authors' extensive teaching and professional experience Gas Turbine Theory is the classic course text on gas turbines, suitable for both undergraduate and graduate students of mechanical and aeronautical engineering. This new edition will also continue to be a valuable reference for practising gas turbine engineers. THE AUTHORS H.I.H. Saravanamuttoo, Professor Emeritus, Dept of Mechanical and Aerospace Engineering, Carleton University, Ottawa, Canada, has many years experience in the gas turbine industry on both sides of the Atlantic, and is a Past President of the Canadian Aeronautics and Space Institute. G.F.C. Rogers was, until retirement, Professor of Engineering Thermodynamics at the University of Bristol. He is author, with Y.R. Mayhew, of Engineering Thermodynamics Work and Heat Transfer, 4th edition. The late H. Cohen, was formerly University Lecturer and Director of Studies in Engineering at Queen's College, Cambridge.

The Development of the Power Generation Gas Turbine at BBC - ABB - Alstom Gas Turbine Engineering Handbook

Covering basic theory, components, installation, maintenance, manufacturing, regulation and industry developments, Gas Turbines: A Handbook of Air, Sea and Land Applications is a broad-based introductory reference designed to give you the knowledge needed to succeed in the gas turbine industry, land, sea and air applications. Providing the big picture view that other detailed, data-focused resources lack, this book has a strong focus on the information needed to effectively decision-make and plan gas turbine system use for particular applications, taking into consideration not only operational requirements but long-term life-cycle costs in upkeep, repair and future use. With concise, easily digestible overviews of all important theoretical bases and a practical focus throughout, Gas Turbines is an ideal handbook for those new to the field or in the early stages of their career, as well as more experienced engineers looking for a reliable, one-stop reference that covers the breadth of the field. Covers installation, maintenance, manufacturer's

specifications, performance criteria and future trends, offering a rounded view of the area that takes in technical detail as well as well as industry economics and outlook Updated with the latest industry developments, including new emission and efficiency regulations and their impact on gas turbine technology Over 300 pages of new/revised content, including new sections on microturbines, non-conventional fuel sources for microturbines, emissions, major developments in aircraft engines, use of coal gas and superheated steam, and new case histories throughout highlighting component improvements in all systems and sub-systems.