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[Improving Environmental Performance in Marine Transportation](#) Springer Nature

Specifically designed as an introduction to the exciting world of engineering, **ENGINEERING FUNDAMENTALS: AN INTRODUCTION TO ENGINEERING** encourages students to become engineers and prepares them with a solid foundation in the fundamental principles and physical laws. The book begins with a discovery of what engineers do as well as an inside look into the various areas of specialization. An explanation on good study habits and what it takes to succeed is included as well as an introduction to design and problem solving, communication, and ethics. Once this foundation is established, the book moves on to the basic physical concepts and laws that students will encounter regularly. The framework of this text teaches students that engineers apply physical and chemical laws and principles as well as mathematics to design, test, and supervise the production of millions of parts, products, and services that people use every day. By gaining problem solving skills and

an understanding of fundamental principles, students are on their way to becoming analytical, detail-oriented, and creative engineers. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Fundamentals, Sustainability, Design Springer Science & Business Media

Joining Processes for Dissimilar and Advanced Materials describes how to overcome the many challenges involved in the joining of similar and dissimilar materials resulting from factors including different thermal coefficients and melting points. Traditional joining processes are ineffective with many newly developed materials. The ever-increasing industrial demands for production efficiency and high-performance materials are also pushing this technology forward. The resulting emergence of advanced micro- and nanoscale material joining technologies, have provided many solutions to these challenges. Drawing on the latest research, this book describes primary and secondary processes for the joining of advanced materials such as metals and alloys, intermetallics, ceramics, glasses, polymers, superalloys, electronic materials and composites in similar and dissimilar combinations. It also covers details of joint design, quality assurance, economics and service

life of the product. Provides valuable information on innovative joining technologies including induction heating of metals, ultrasonic heating, and laser heating at micro- and nanoscale levels. Describes the newly developed modelling, simulation and digitalization of the joining process. Includes a methodology for characterization of joints.

FUNDAMENTALS OF INTERNAL COMBUSTION ENGINES John Wiley & Sons

Internal Combustion Engine Fundamentals McGraw-Hill Science Engineering

Alternative Fuels and Advanced Combustion Techniques as Sustainable Solutions for Internal Combustion Engines Pearson

This book provides an overview of the nonlinear model predictive control (NMPC) concept for application to innovative combustion engines. Readers can use this book to become more expert in advanced combustion engine control and to develop and implement their own NMPC algorithms to solve challenging control tasks in the field. The significance of the advantages and relevancy for practice is demonstrated by real-world engine and vehicle application examples. The author provides an overview of fundamental engine control systems, and addresses emerging control problems, showing how they can be solved with NMPC. The implementation of NMPC involves various development steps, including:

- reduced-order modeling of the process;
- analysis of system dynamics;
- formulation of the optimization problem; and
- real-time feasible numerical solution of the optimization problem.

Readers will see the entire process of these steps, from the fundamentals to several innovative applications. The application examples

highlight the actual difficulties and advantages when implementing NMPC for engine control applications. *Nonlinear Model Predictive Control of Combustion Engines* targets engineers and researchers in academia and industry working in the field of engine control. The book is laid out in a structured and easy-to-read manner, supported by code examples in MATLAB®/Simulink®, thus expanding its readership to students and academics who would like to understand the fundamental concepts of NMPC. *Advances in Industrial Control* reports and encourages the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.

Engineering Fundamentals of the Internal Combustion Engine Springer Nature

This book focuses on the interaction between shipping and the natural environment and how shipping can strive to become more sustainable. Readers are guided in marine environmental awareness, environmental regulations and abatement technologies to assist in decisions on strategy, policy and investments. You will get familiar with possible paths to improve environmental performance and, in the long term, to a sustainable shipping sector, based on an understanding of the sources and mechanisms of common impacts. You will also gain knowledge on emissions and discharges from ships, prevention measures, environmental regulations, and methods and tools for environmental assessment. In addition, the book includes a chapter on the background to regulating pollution from ships. It is intended as a source of information for professionals connected to maritime activities as well as policy makers and interested public. It is also intended as a textbook in higher education academic

programmes.

Joining Processes for Dissimilar and Advanced Materials CRC Press

NO_x Emission Control Technologies in Stationary and Automotive Internal Combustion Engines: Approaches Toward NO_x Free Automobiles presents the fundamental theory of emission formation, particularly the oxides of nitrogen (NO_x) and its chemical reactions and control techniques. The book provides a simplified framework for technical literature on NO_x reduction strategies in IC engines, highlighting thermodynamics, combustion science, automotive emissions and environmental pollution control. Sections cover the toxicity and roots of emissions for both SI and CI engines and the formation of various emissions such as CO, SO₂, HC, NO_x, soot, and PM from internal combustion engines, along with various methods of NO_x formation. Topics cover the combustion process, engine design parameters, and the application of exhaust gas recirculation for NO_x reduction, making this book ideal for researchers and students in automotive, mechanical, mechatronics and chemical engineering students working in the field of emission control techniques. Covers advanced and recent technologies and emerging new trends in NO_x reduction for emission control Highlights the effects of exhaust gas recirculation (EGR) on engine performance parameters Discusses emission norms such as EURO VI and Bharat stage VI in reducing global air pollution due to engine emissions

Hydrogen Power: Theoretical and Engineering Solutions Academic Press

This applied thermoscience book covers the basic principles and applications of various types of internal combustion engines. Explores the fundamentals of most types of internal

combustion engines with a major emphasis on reciprocating engines. Covers both spark ignition and compression ignition engines as well as those operating on four-stroke cycles and on two-stroke cycles ranging in size from small model airplane engines to the larger stationary engines. Examines recent advancements, such as, Miller cycle analysis, lean burn engines, 2-stroke cycle automobile engines, variable valve timing, and thermal storage.

Combustion Pearson Higher Ed

Internal Combustion Engines covers the trends in passenger car engine design and technology. This book is organized into seven chapters that focus on the importance of the in-cylinder fluid mechanics as the controlling parameter of combustion. After briefly dealing with a historical overview of the various phases of automotive industry, the book goes on discussing the underlying principles of operation of the gasoline, diesel, and turbocharged engines; the consequences in terms of performance, economy, and pollutant emission; and of the means available for further development and improvement. A chapter focuses on the automotive fuels of the various types of engines. Recent developments in both the experimental and computational fronts and the application of available research methods on engine design, as well as the trends in engine technology, are presented in the concluding chapters. This book is an ideal compact reference for automotive researchers and engineers and graduate engineering students.

Introduction to Internal Combustion Engines Springer Science & Business Media

This text, by a leading authority in the field, presents a fundamental and factual development of the science and engineering underlying the design of combustion engines and turbines. An extensive illustration program supports the concepts and theories discussed.

Novel Internal Combustion Engine Technologies for Performance Improvement and Emission Reduction Springer Science & Business Media

This volume contains selected contributions to the second Hydrogen Power, Theoretical and Engineering Solutions, International Symposium (HYPOTHESIS II), held in Grimstad, Norway, from 18 to 22 August 1997. The scientific programme included 10 oral sessions and a poster session. Widely based national committees, supported by an International Scientific Advisory Board and the International Coordinators, made every effort to design and bring together a programme of great excellence. The more than one hundred papers submitted represent the efforts of research groups from all over the World. The international character of HYPOTHESIS II has been augmented by contributions coming from seven countries outside Europe. The contributions reflect the progress that has been achieved in hydrogen technology aimed primarily at hydrogen as the ultimate energy vector. This research have already yielded mature technologies for mass production in many areas. These and future results will be of increased interest and importance as global and local environmental issues move higher up the political agenda. In order to facilitate new contacts between scientists and strengthen existing ones, the symposium incorporated an extensive social program managed by the Conference Administrator, Ms. Ann Y stad.

From Thermodynamic Optimization to Cyclic Variability Springer Nature

This book analyzes how transport influences the ecology of various regions. Integrating perspectives and approaches from around the globe, it examines the use of different types of engines and fuels, and assesses the impact of vehicle design on the environment. The book also addresses the effect of the transport situation in agglomerations on their environmental safety. Various types of environmental impacts are considered, from traditional emissions to noise and vibration. Presenting scientific advances from 7 European countries, the book appeals to experts, teachers and students, as well as to anyone interested in the environmental aspects of the transport industry.

Modeling and Electronic Management of Internal Combustion Engines John Wiley & Sons

Summarizes the analysis and design of today's gas heat engine cycles This book offers readers comprehensive coverage of heat engine cycles. From ideal (theoretical) cycles to practical cycles and real cycles, it gradually increases in degree of complexity so that newcomers can learn and advance at a logical pace, and so instructors can tailor their courses toward each class level. To facilitate the transition from one type of cycle to another, it offers readers additional material covering fundamental engineering science principles in mechanics, fluid mechanics, thermodynamics, and thermochemistry. Fundamentals of Heat Engines: Reciprocating and Gas Turbine Internal-Combustion Engines begins with a review of some fundamental principles of engineering science, before covering a wide range of topics on thermochemistry. It next discusses theoretical aspects of the reciprocating piston engine, starting with simple air-standard cycles, followed by theoretical cycles of forced induction engines, and ending with more realistic cycles that can be used to predict engine performance as a first approximation.

Lastly, the book looks at gas turbines and covers cycles with gradually increasing complexity to end with realistic engine design-point and off-design calculations methods. Covers two main heat engines in one single reference Teaches heat engine fundamentals as well as advanced topics Includes comprehensive thermodynamic and thermochemistry data Offers customizable content to suit beginner or advanced undergraduate courses and entry-level postgraduate studies in automotive, mechanical, and aerospace degrees Provides representative problems at the end of most chapters, along with a detailed example of piston-engine design-point calculations Features case studies of design-point calculations of gas turbine engines in two chapters Fundamentals of Heat Engines can be adopted for mechanical, aerospace, and automotive engineering courses at different levels and will also benefit engineering professionals in those fields and beyond.

Basic Electrical and Electronics

Engineering Macmillan International Higher Education

Environmental Engineering: Fundamentals, Sustainability, Design presents civil engineers with an introduction to chemistry and biology, through a mass and energy balance approach. ABET required topics of emerging importance, such as sustainable and global engineering are also covered. Problems, similar to those on the FE and PE exams, are integrated at the end of each chapter. Aligned with the National Academy of Engineering's focus on managing carbon and nitrogen, the 2nd edition now includes a section on advanced technologies to more effectively reclaim nitrogen and phosphorous. Additionally, readers have immediate access to web modules, which address a specific topic, such as water and

wastewater treatment. These modules include media rich content such as animations, audio, video and interactive problem solving, as well as links to explorations. Civil engineers will gain a global perspective, developing into innovative leaders in sustainable development.

Engineering Fundamentals of the Internal Combustion Engine:

Pearson New International Edition

John Wiley & Sons

Fundamentals of Combustion

Processes is designed as a textbook for an upper-division undergraduate and graduate level combustion course in mechanical engineering. The authors focus on the fundamental theory of combustion and provide a simplified discussion of basic combustion parameters and processes such as thermodynamics, chemical kinetics, ignition, diffusion and pre-mixed flames. The text includes exploration of applications, example exercises, suggested homework problems and videos of laboratory demonstrations

Shipping and the Environment PHI

Learning Pvt. Ltd.

This monograph covers different aspects related to utilization of alternative fuels in internal combustion (IC) engines with a focus on biodiesel, dimethyl ether, alcohols, biogas, etc. The focal point of this book is to present engine combustion, performance and emission characteristics of IC engines fueled by these alternative fuels. A section of this book also covers the potential strategies of utilization of these alternative fuels in an energy efficient manner to reduce the harmful pollutants

emitted from IC engines. It presents the comparative analysis of different alternative fuels in a variety of engines to show the appropriate alternative fuel for specific types of engines. This book will prove useful for both researchers as well as energy experts and policy makers.

Reciprocating and Gas Turbine Internal Combustion Engines John Wiley & Sons

A discussion of the opportunities and challenges involved in mitigating greenhouse gas emissions from passenger travel.

Assessment of Fuel Economy Technologies for Light-Duty Vehicles Elsevier

Since the publication of the Second Edition in 2001, there have been considerable advances and developments in the field of internal combustion engines. These include the increased importance of biofuels, new internal combustion processes, more stringent emissions requirements and characterization, and more detailed engine performance modeling, instrumentation, and control. There have also been changes in the instructional methodologies used in the applied thermal sciences that require inclusion in a new edition. These methodologies suggest that an increased focus on applications, examples, problem-based learning, and computation will have a positive effect on learning of the material, both at the novice student, and practicing engineer level. This Third Edition mirrors its predecessor with additional tables, illustrations, photographs, examples, and problems/solutions. All of the software is 'open source', so that readers can see how the computations are performed. In addition to additional java applets, there is companion Matlab code, which has become a default computational tool in

most mechanical engineering programs. **Engine Modeling and Control** MIT Press 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 updated 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 additional worked examples and progressively challenging end-of- chapter exercises that provide practice for analysis, preliminary design, and systems integration

Internal Combustion Engines Elsevier This book discusses all aspects of advanced engine technologies, and describes the role of alternative fuels and solution-based modeling studies in meeting the increasingly higher standards of the automotive industry. By promoting research into more efficient and environment-friendly combustion technologies, it helps enable researchers to develop higher-power engines with lower fuel consumption, emissions, and noise levels. Over the course of 12 chapters, it covers research in areas such as homogeneous charge compression ignition (HCCI) combustion and control

strategies, the use of alternative fuels and additives in combination with new combustion technology and novel approaches to recover the pumping loss in the spark ignition engine. The book will serve as a valuable resource for academic researchers and professional automotive engineers alike.

Environmental Engineering Elsevier

Providing a comprehensive introduction to the basics of Internal Combustion Engines, this book is suitable for: Undergraduate-level courses in mechanical engineering, aeronautical engineering, and automobile engineering. Postgraduate-level courses (Thermal Engineering) in mechanical engineering. A.M.I.E. (Section B) courses in mechanical engineering. Competitive examinations, such as Civil Services, Engineering Services, GATE, etc. In addition, the book can be used for refresher courses for professionals in auto-mobile industries. Coverage Includes Analysis of processes (thermodynamic, combustion, fluid flow, heat transfer, friction and lubrication) relevant to design, performance, efficiency, fuel and emission requirements of internal combustion engines. Special topics such as reactive systems, unburned and burned mixture charts, fuel-line hydraulics, side thrust on the cylinder walls, etc. Modern developments such as electronic fuel injection systems, electronic ignition systems, electronic indicators, exhaust emission requirements, etc. The Second Edition includes new sections on geometry of reciprocating engine, engine performance parameters, alternative fuels for IC engines, Carnot cycle,

Stirling cycle, Ericsson cycle, Lenoir cycle, Miller cycle, crankcase ventilation, supercharger controls and homogeneous charge compression ignition engines. Besides, air-standard cycles, latest advances in fuel-injection system in SI engine and gasoline direct injection are discussed in detail. New problems and examples have been added to several chapters. Key Features Explains basic principles and applications in a clear, concise, and easy-to-read manner Richly illustrated to promote a fuller understanding of the subject SI units are used throughout Example problems illustrate applications of theory End-of-chapter review questions and problems help students reinforce and apply key concepts Provides answers to all numerical problems