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Aerospace Propulsion Systems - Thomas A. Ward 2010-05-17

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

Thermodynamics - Yunus A. Çengel 2002

The 4th Edition of Cengel & Boles *Thermodynamics: An Engineering Approach* takes thermodynamics education to the next level through its intuitive and innovative approach. A long-time favorite among students and instructors alike because of its highly engaging, student-oriented conversational writing style, this book is now the most widely adopted thermodynamics text in the U.S. and in the world.

Thermodynamics - Yunus A. Çengel 2011

Accompanying DVD-ROM contains the Limited Academic Version of EES (Engineering Equation Solver) software with scripted solutions to selected text problems.

Encyclopedia of Life Support Systems - Gustavo V. Barbosa-Cánovas 2005

With an increasing global population, developing efficient methods for the mass production of food supplies has become crucial. Food engineering provides a vital link between primary food production and final consumption. As part of the online *Encyclopedia of Life Support Systems (EOLSS)*, Food Engineering is a multi-author work that provides a rich source of information on the fundamental aspects of food processing, preservation, production and consumption. It discusses the basics underlying food transformation from both the standpoint of food technology and food engineering. This publication is essential reading for educators, university students, professional practitioners and decision-makers at all levels

Thermodynamics and Energy Systems - American Society of Mechanical Engineers. Winter Meeting 1991

Optimization of Energy Systems - Ibrahim Dincer 2017-05-03

An essential resource for optimizing energy systems to enhance design capability, performance and

sustainability *Optimization of Energy Systems* comprehensively describes the thermodynamic modelling, analysis and optimization of numerous types of energy systems in various applications. It provides a new understanding of the system and the process of defining proper objective functions for determination of the most suitable design parameters for achieving enhanced efficiency, cost effectiveness and sustainability. Beginning with a general summary of thermodynamics, optimization techniques and optimization methods for thermal components, the book goes on to describe how to determine the most appropriate design parameters for more complex energy systems using various optimization methods. The results of each chapter provide potential tools for design, analysis, performance improvement, and greenhouse gas emissions reduction. Key features: Comprehensive coverage of the modelling, analysis and optimization of many energy systems for a variety of applications. Examples, practical applications and case studies to put theory into practice. Study problems at the end of each chapter that foster critical thinking and skill development. Written in an easy-to-follow style, starting with simple systems and moving to advanced energy systems and their complexities. A unique resource for understanding cutting-edge research in the thermodynamic analysis and optimization of a wide range of energy systems, *Optimization of Energy Systems* is suitable for graduate and senior undergraduate students, researchers, engineers, practitioners, and scientists in the area of energy systems.

Sustainable Utility Systems - Petar Sabev Varbanov 2020-12-07

This book provides a thorough guidance on maximizing the performance of utility systems in terms of sustainability. It covers general structure, typical components and efficiency trends, and applications such as top-level analysis for steam pricing and selection of processes for improved heat integration. Examples are provided to illustrate the discussed models and methods to give sufficient learning experience for the reader.

Fundamentals of Thermodynamics - Claus Borgnakke 2014

Refrigeration Systems and Applications - Ibrahim Dincer 2017-05-30

The definitive text/reference for students, researchers and practicing engineers This book provides comprehensive coverage on refrigeration systems and applications, ranging from the fundamental principles of thermodynamics to food cooling applications for a wide range of sectoral utilizations. Energy and exergy analyses as well as performance assessments through energy and exergy efficiencies and energetic and exergetic coefficients of performance are explored, and numerous analysis techniques, models, correlations and procedures are introduced with examples and case studies. There are specific sections allocated to environmental impact assessment and sustainable development studies. Also featured are discussions of important recent developments in the field, including those stemming from the author's pioneering research. Refrigeration is a uniquely positioned multi-disciplinary field encompassing mechanical, chemical, industrial and food engineering, as well as chemistry. Its wide-ranging applications mean that the industry plays a key role in national and international economies. And it continues to be an area of active research, much of it focusing on making the technology as environmentally friendly and sustainable as possible without compromising cost efficiency and effectiveness. This substantially updated and revised edition of the classic text/reference now features two new chapters devoted to renewable-energy-based integrated refrigeration systems and environmental impact/sustainability assessment. All

examples and chapter-end problems have been updated as have conversion factors and the thermophysical properties of an array of materials. Provides a solid foundation in the fundamental principles and the practical applications of refrigeration technologies Examines fundamental aspects of thermodynamics, refrigerants, as well as energy and exergy analyses and energy and exergy based performance assessment criteria and approaches Introduces environmental impact assessment methods and sustainability evaluation of refrigeration systems and applications Covers basic and advanced (and hence integrated) refrigeration cycles and systems, as well as a range of novel applications Discusses crucial industrial, technical and operational problems, as well as new performance improvement techniques and tools for better design and analysis Features clear explanations, numerous chapter-end problems and worked-out examples Refrigeration Systems and Applications, Third Edition is an indispensable working resource for researchers and practitioners in the areas of Refrigeration and Air Conditioning. It is also an ideal textbook for graduate and senior undergraduate students in mechanical, chemical, biochemical, industrial and food engineering disciplines.

Applied Mechanics Reviews - 1995

Thermodynamics - Yunus A. Çengel 2014-08

"Thermodynamics, An Engineering Approach," eighth edition, covers the basic principles of thermodynamics while presenting a wealth of real-world engineering examples so students get a feel for how thermodynamics is applied in engineering practice. This text helps students develop an intuitive understanding by emphasizing the physics and physical arguments. Çengel and Boles explore the various facets of thermodynamics through careful explanations of concepts and use of numerous practical examples and figures, having students develop necessary skills to bridge the gap between knowledge and the confidence to properly apply their knowledge. McGraw-Hill is proud to offer "Connect" with the eighth edition of Çengel/Boles, "Thermodynamics, An Engineering Approach." This innovative and powerful new system helps your students learn more efficiently and gives you the ability to assign homework problems simply and easily. Problems are graded automatically, and the results are recorded immediately. Track individual student performance - by question, assignment, or in relation to the class overall with detailed grade reports. ConnectPlus provides students with all the advantages of Connect, plus 24/7 access to an eBook. Çengel's "Thermodynamics," eighth edition, includes the power of McGraw-Hill's "LearnSmart" a proven adaptive learning system that helps students learn faster, study more efficiently, and retain more knowledge through a series of adaptive questions. This innovative study tool pinpoints concepts the student does not understand and maps out a personalized plan for success.

The Exergy Method of Thermal Plant Analysis - T. J. Kotas 2013-10-22

The Exergy Method of Thermal Plant Analysis aims to discuss the history, related concepts, applications, and development of the Exergy Method - analysis technique that uses the Second Law of Thermodynamics as the basis of evaluation of thermodynamic loss. The book, after an introduction to thermodynamics and its related concepts, covers concepts related to exergy, such as physical and chemical exergy, exergy concepts for a control method and a closed-system analysis, the exergy analysis of simple processes, and the thermocentric applications of exergy. A seven-part appendix is also included. Appendices A-D covers miscellaneous information on exergy, and Appendix E features charts of thermodynamic properties. Appendix F is a glossary of terms, and Appendix G contains the list of references. The text is recommended for physicists who would like to know more about the Exergy Method, its underlying principles, and its applications not only in thermal plant analysis but also in certain areas.

Solutions Manual to Accompany Fundamentals of Engineering Thermodynamics - John R. Howell 1987

Thermodynamics and the Design, Analysis, and Improvement of Energy Systems, 1992 - American Society of Mechanical Engineers. Winter Meeting 1992

Heat Transfer - Yunus A. Çengel 2002-10

CD-ROM contains: the limited academic version of Engineering equation solver(EES) with homework

problems.

Application of Exergy - Tolga Taner 2018-06-06

The main scope of this study is to emphasize exergy efficiency in all fields of industry. The chapters collected in the book are contributed by invited researchers with a long-standing experience in different research areas. I hope that the material presented here is understandable to a wide audience, not only energy engineers but also scientists from various disciplines. The book contains seven chapters in three sections: (1) "General Information about Exergy," (2) "Exergy Applications," and (3) "Thermoeconomic Analysis." This book provides detailed and up-to-date evaluations in different areas written by academics with experience in their fields. It is anticipated that this book will make a scientific contribution to exergy workers, researchers, academics, PhD students, and other scientists in both the present and the future.

Physics of Cryogenics - Bahman Zohuri 2017-11-17

Physics of Cryogenics: An Ultralow Temperature Phenomenon discusses the significant number of advances that have been made during the last few years in a variety of cryocoolers, such as Brayton, Joule-Thomson, Stirling, pulse tube, Gifford-McMahon and magnetic refrigerators. The book reviews various approaches taken to improve reliability, a major driving force for new research areas. The advantages and disadvantages of different cycles are compared, and the latest improvements in each of these cryocoolers is discussed. The book starts with the thermodynamic fundamentals, followed by the definition of cryogenic and the associated science behind low temperature phenomena and properties. This book is an ideal resource for scientists, engineers and graduate and senior undergraduate students who need a better understanding of the science of cryogenics and related thermodynamics. Defines the fundamentals of thermodynamics that are associated with cryogenic processes Provides an overview of the history of the development of cryogenic technology Includes new, low temperature tables written by the author Deals with the application of cryogenics to preserve objects at very low temperature Explains how cryogenic phenomena work for human cell and human body preservations and new medical approaches

TEXTBOOK OF PHYSICAL CHEMISTRY - H. K. MOUDGIL 2014-10-21

This comprehensive textbook, now in its second edition, is mainly written as per the latest syllabi of physical chemistry of all the leading universities of India as well as the new syllabus recommended by the UGC. This thoroughly revised and updated edition covers the principal areas of physical chemistry, such as thermodynamics, quantum chemistry, molecular spectroscopy, chemical kinetics, electrochemistry and nanotechnology. In a methodical and accessible style, the book discusses classical, irreversible and statistical thermodynamics and statistical mechanics, and describes macroscopic chemical systems, steady states and thermodynamics at a molecular level. It elaborates the underlying principles of quantum mechanics, molecular spectroscopy, X-ray crystallography and solid state chemistry along with their applications. The book explains various instrumentation techniques such as potentiometry, polarography, voltammetry, conductometry and coulometry. It also describes kinetics, rate laws and chemical processes at the electrodes. In addition, the text deals with chemistry of corrosion and nanomaterials. This text is primarily designed for the undergraduate and postgraduate students of chemistry (B.Sc. and M.Sc.) for their course in physical chemistry. Key Features • Gives a thorough treatment to ensure a solid grasp of the material. • Presents a large number of figures and diagrams that help amplify key concepts. • Contains several worked-out examples for better understanding of the subject matter. • Provides numerous chapter-end exercises to foster conceptual understanding.

Advanced University Physics - Mircea S. Rogalski 2018-10-03

To move from empirical-based physics to the theoretical abstractness required for advanced physics requires a paradigmatic shift in logic that can challenge even the brightest mind. Grasping the play of phenomena as they are described in introductory compendiums does not necessarily create a foundation that allows for the building of a bridge to the higher levels of theoretical physics. In the first edition of Advanced University Physics, respected physicists Stuart Palmer and Mircea Rogalski built that bridge, and then guided readers across it. Serving as a supplement to the standard advanced physics syllabus, their work provided a succinct review of course material, while encouraging the development of a more cohesive understanding of theoretical physics. Now, after incorporating suggestions from many readers and colleagues, the two authors have revised and updated their original work to produce a second, even more

poignant, edition. Succinct, cohesive, and comprehensive, Advanced University Physics, Second Edition brings individuals schooled in the rudiments of physics to theoretical fluency. In a progression of concise chapters, the text clarifies concepts from Newtonian Laws to nuclear dynamics, while introducing and building upon the theoretical logic required to operate in the world of contemporary physics. Some chapters have been combined to improve relational clarity, and new material has been added to cover the evolving concepts that have emerged over the last decade in this highly fluid field. The authors have also added a substantial amount of relevant problems and at least one pertinent example for every chapter. Those already steeped in physics will continue to find this work to be a useful reference, as the book's 47 chapters provide the opportunity to become refreshed and updated on a great number of easily identified topics.

Heat Storage: A Unique Solution For Energy Systems - Ibrahim Dincer 2018-10-09

This book covers emerging energy storage technologies and material characterization methods along with various systems and applications in building, power generation systems and thermal management. The authors present options available for reducing the net energy consumption for heating/cooling, improving the thermal properties of the phase change materials and optimization methods for heat storage embedded multi-generation systems. An in-depth discussion on the natural convection-driven phase change is included. The book also discusses main energy storage options for thermal management practices in photovoltaics and phase change material applications that aim passive thermal control. This book will appeal to researchers and professionals in the fields of mechanical engineering, chemical engineering, electrical engineering, renewable energy, and thermodynamics. It can also be used as an ancillary text in upper-level undergraduate courses and graduate courses in these fields.

Loose Leaf Thermodynamics: An Engineering Approach with Student Resources DVD - Yunus Cengel 2012-08-24

Thermodynamics Seventh Edition covers the basic principles of thermodynamics while presenting a wealth of real-world engineering examples so students get a feel for how thermodynamics is applied in engineering practice. This text helps students develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments. Cengel/Boles explore the various facets of thermodynamics through careful explanations of concepts and its use of numerous practical examples and figures, having students develop necessary skills to bridge the gap between knowledge and the confidence to properly apply knowledge. The media package for this text is extensive, giving users a large variety of supplemental resources to choose from. A Student Resources DVD is packaged with each new copy of the text and contains the popular Engineering Equation Solver (EES) software. McGraw-Hill's new Connect is available to students and instructors. Connect is a powerful, web-based assignment management system that makes creating and grading assignments easy for instructors and learning convenient for students. It saves time and makes learning for students accessible anytime, anywhere. With Connect, instructors can easily manage assignments, grading, progress, and students receive instant feedback from assignments and practice problems.

Fundamentals of Chemical Engineering Thermodynamics, SI Edition - Kevin D. Dahm 2014-02-21

A brand new book, FUNDAMENTALS OF CHEMICAL ENGINEERING THERMODYNAMICS makes the abstract subject of chemical engineering thermodynamics more accessible to undergraduate students. The subject is presented through a problem-solving inductive (from specific to general) learning approach, written in a conversational and approachable manner. Suitable for either a one-semester course or two-semester sequence in the subject, this book covers thermodynamics in a complete and mathematically rigorous manner, with an emphasis on solving practical engineering problems. The approach taken stresses problem-solving, and draws from best practice engineering teaching strategies. FUNDAMENTALS OF CHEMICAL ENGINEERING THERMODYNAMICS uses examples to frame the importance of the material. Each topic begins with a motivational example that is investigated in context to that topic. This framing of the material is helpful to all readers, particularly to global learners who require big picture insights, and hands-on learners who struggle with abstractions. Each worked example is fully annotated with sketches and comments on the thought process behind the solved problems. Common errors are presented and explained. Extensive margin notes add to the book accessibility as well as presenting opportunities for

investigation. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Loose Leaf Version for Thermodynamics: An Engineering Approach 7E - Yunus Cengel 2012-06-22

Thermodynamics Seventh Edition covers the basic principles of thermodynamics while presenting a wealth of real-world engineering examples so students get a feel for how thermodynamics is applied in engineering practice. This text helps students develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments. Cengel/Boles explore the various facets of thermodynamics through careful explanations of concepts and its use of numerous practical examples and figures, having students develop necessary skills to bridge the gap between knowledge and the confidence to properly apply knowledge. The media package for this text is extensive, giving users a large variety of supplemental resources to choose from. A Student Resources DVD is packaged with each new copy of the text and contains the popular Engineering Equation Solver (EES) software. McGraw-Hill's new Connect is available to students and instructors. Connect is a powerful, web-based assignment management system that makes creating and grading assignments easy for instructors and learning convenient for students. It saves time and makes learning for students accessible anytime, anywhere. With Connect, instructors can easily manage assignments, grading, progress, and students receive instant feedback from assignments and practice problems.

Energy, Entropy and Engines - Sanjeev Chandra 2016-05-16

Textbook concisely introduces engineering thermodynamics, covering concepts including energy, entropy, equilibrium and reversibility Novel explanation of entropy and the second law of thermodynamics Presents abstract ideas in an easy to understand manner Includes solved examples and end of chapter problems Accompanied by a website hosting a solutions manual

Schaum's Outline of Thermodynamics for Engineers, 2ed - Merle Potter 2010-05-23

Tough Test Questions? Missed Lectures? Not Enough Time? Fortunately for you, there's Schaum's Outlines. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you Practice problems with full explanations that reinforce knowledge Coverage of the most up-to-date developments in your course field In-depth review of practices and applications Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time-and get your best test scores! Schaum's Outlines-Problem Solved.

Introductory Chemical Engineering Thermodynamics - J. Richard Elliott 2012-02-06

A Practical, Up-to-Date Introduction to Applied Thermodynamics, Including Coverage of Process Simulation Models and an Introduction to Biological Systems Introductory Chemical Engineering Thermodynamics, Second Edition, helps readers master the fundamentals of applied thermodynamics as practiced today: with extensive development of molecular perspectives that enables adaptation to fields including biological systems, environmental applications, and nanotechnology. This text is distinctive in making molecular perspectives accessible at the introductory level and connecting properties with practical implications. Features of the second edition include Hierarchical instruction with increasing levels of detail: Content requiring deeper levels of theory is clearly delineated in separate sections and chapters Early introduction to the overall perspective of composite systems like distillation columns, reactive processes, and biological systems Learning objectives, problem-solving strategies for energy balances and phase equilibria, chapter summaries, and "important equations" for every chapter Extensive practical examples, especially coverage of non-ideal mixtures, which include water contamination via hydrocarbons, polymer blending/recycling, oxygenated fuels, hydrogen bonding, osmotic pressure, electrolyte solutions, zwitterions and biological molecules, and other contemporary issues Supporting software in formats for both MATLAB® and spreadsheets Online supplemental sections and resources including instructor slides, ConcepTests, coursecast videos, and other useful resources

Loose Leaf for Thermodynamics: An Engineering Approach - Yunus A. Cengel, Dr. 2018-01-24
Thermodynamics, An Engineering Approach, covers the basic principles of thermodynamics while

presenting a wealth of real-world engineering examples, so students get a feel for how thermodynamics is applied in engineering practice. This text helps students develop an intuitive understanding by emphasizing the physics and physical arguments. Cengel and Boles explore the various facets of thermodynamics through careful explanations of concepts and use of numerous practical examples and figures, having students develop necessary skills to bridge the gap between knowledge, and the confidence to properly apply their knowledge. The 9th edition offers new video and applet tools inside Connect. McGraw-Hill Education's Connect, is also available as an optional, add on item. Connect is the only integrated learning system that empowers students by continuously adapting to deliver precisely what they need, when they need it, how they need it, so that class time is more effective. Connect allows the professor to assign homework, quizzes, and tests easily and automatically grades and records the scores of the student's work. Problems are randomized to prevent sharing of answers and may also have a "multi-step solution" which helps move the students' learning along if they experience difficulty.

Basic And Applied Thermodynamics - P. K. NAG 2009

Proceedings of the ASME Advanced Energy Systems Division - American Society of Mechanical Engineers. Advanced Energy Systems Division 1996

Nonequilibrium Thermodynamics - Yasar Demirel 2013-12-16

Natural phenomena consist of simultaneously occurring transport processes and chemical reactions. These processes may interact with each other and may lead to self-organized structures, fluctuations, instabilities, and evolutionary systems. Nonequilibrium Thermodynamics, Third Edition emphasizes the unifying role of thermodynamics in analyzing the natural phenomena. This third edition updates and expands on the first and second editions by focusing on the general balance equations for coupled processes of physical, chemical, and biological systems. The new edition contains a new chapter on stochastic approaches to include the statistical thermodynamics, mesoscopic nonequilibrium thermodynamics, fluctuation theory, information theory, and modeling the coupled biochemical systems in thermodynamic analysis. This new addition also comes with more examples and practice problems. Informs and updates on all the latest developments in the field Contributions from leading authorities and industry experts A useful text for seniors and graduate students from diverse engineering and science programs to analyze some nonequilibrium, coupled, evolutionary, stochastic, and dissipative processes Highlights fundamentals of equilibrium thermodynamics, transport processes and chemical reactions Expands the theory of nonequilibrium thermodynamics and its use in coupled transport processes and chemical reactions in physical, chemical, and biological systems Presents a unified analysis for transport and rate processes in various time and space scales Discusses stochastic approaches in thermodynamic analysis including fluctuation and information theories Has 198 fully solved examples and 287 practice problems An Instructor Resource containing the Solution Manual can be obtained from the author: ydemirel2@unl.edu

Essential Thermodynamics - Athanassios Z. Panagiotopoulos 2011-01

This textbook covers basic principles of equilibrium behavior for systems of interest to chemical engineering, including elementary microscopic concepts. A strong emphasis is placed on fundamentals: energy conservation in open and closed systems (first law), temperature, entropy and reversibility (second law), fundamental equations, and criteria for equilibrium and stability. These concepts are then applied to the analysis of energy conversion processes, mixing, phase equilibria, and chemical reactions.

Introduction to Engineering Thermodynamics - Richard E. Sonntag 2001-08-10

Engineering Thermodynamics - R. K. Rajput 2010

Mechanical Engineering

Non-equilibrium Thermodynamics For Engineers (Second Edition) - Signe Kjelstrup 2017-02-15

Kjelstrup, Bedeaux, Johannessen, and Gross describe what non-equilibrium thermodynamics is in a simple and practical way and how it can add to engineering design. They explain how to describe proper equations of transport that are more precise than those used so far, and how to use them to understand the waste of energy resources in central process units in the industry. The authors introduce the entropy balance as an

additional equation to use in engineering; to create consistent thermodynamic models, and to systematically minimize energy losses that are connected with the transport of heat, mass, charge and momentum. Non-equilibrium Thermodynamics for Engineers teaches the essence of non-equilibrium thermodynamics and its applications at a level comprehensible to engineering students, practitioner engineers, and scientists working on industrial problems. The book may be used as a textbook in basic engineering curricula or graduate courses.

Entropy Based Design and Analysis of Fluids Engineering Systems - Greg F. Naterer 2008-02-27

From engineering fluid mechanics to power systems, information coding theory and other fields, entropy is key to maximizing performance in engineering systems. It serves a vital role in achieving the upper limits of efficiency of industrial processes and quality of manufactured products. Entropy based design (EBD) can shed new light on various flow processes, ranging from optimized flow configurations in an aircraft engine to highly ordered crystal structures in a turbine blade. Entropy Based Design of Fluid Engineering Systems provides an overview of EBD as an emerging technology with applications to aerospace, microfluidics, heat transfer, and other disciplines. The text extends past analytical methods of Entropy Generation Minimization to numerical simulations involving more complex configurations and experimental measurement techniques. The book begins with an extensive development of basic concepts, including the mathematical properties of entropy and exergy, as well as statistical and numerical formulations of the second law. It then goes on to describe topics related to incompressible flows and the Second Law in microfluidic systems. The authors develop computational and experimental methods for identifying problem regions within a system through the local rates of entropy production. With these techniques, designers can use EBD to focus on particular regions where design modifications can be made to improve system performance. Numerous case studies illustrate the concepts in each chapter, and cover an array of applications including supersonic flows, condensation and turbulence. A one-of-a-kind reference, Entropy Based Design of Fluid Engineering Systems outlines new advances showing how local irreversibilities can be detected in complex configurations so that engineering devices can be re-designed locally to improve overall performance.

Introduction to Thermodynamics and Heat Transfer - Yunus A. Cengel 2009-02

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.

Entropy and Entropy Generation - J.S. Shiner 2001-11-30

Entropy and entropy generation play essential roles in our understanding of many diverse phenomena ranging from cosmology to biology. Their importance is manifest in areas of immediate practical interest such as the provision of global energy as well as in others of a more fundamental flavour such as the source of order and complexity in nature. They also form the basis of most modern formulations of both equilibrium and nonequilibrium thermodynamics. Today much progress is being made in our understanding of entropy and entropy generation in both fundamental aspects and application to concrete problems. The purpose of this volume is to present some of these recent and important results in a manner that not only appeals to the entropy specialist but also makes them accessible to the nonspecialist looking for an overview of the field. This book contains fourteen contributions by leading scientists in their fields. The content covers such topics as quantum thermodynamics, nonlinear processes, gravitational and irreversible thermodynamics, the thermodynamics of Taylor dispersion, higher order transport, the mesoscopic theory of liquid crystals, simulated annealing, information and biological aspects, global energy, photovoltaics, heat and mass transport and nonlinear electrochemical systems. Audience: This work will be of value to physicists, chemists, biologists and engineers interested in the theory and applications of entropy and its generation.

Thermodynamics - Yunus A. Çengel 2006

CD-ROM contains: Engineering Equation Solver, limited academic version with homework problems -- Interactive thermodynamics tutorial.

Fundamentals of Thermal-fluid Sciences - Yunus A. Çengel 2021

"This text is an abbreviated version of standard thermodynamics, fluid mechanics, and heat transfer texts,

covering topics that engineering students are most likely to need in their professional lives"--

Energy, Entropy and Engines - Sanjeev Chandra 2016-03-22

Textbook concisely introduces engineering thermodynamics, covering concepts including energy, entropy,

equilibrium and reversibility Novel explanation of entropy and the second law of thermodynamics Presents

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Accompanied by a website hosting a solutions manual