

Engineering Heat And Mass Transfer By Mahesh M Rathore

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Engineering Thermodynamics with Worked Examples - Nihal E Wijesundera 2016-11-25
The laws of thermodynamics have wide ranging practical applications in all branches of engineering. This invaluable textbook covers all the subject matter in a typical undergraduate course in engineering thermodynamics, and uses carefully chosen worked examples and problems to expose students to diverse applications of thermodynamics. This new edition has been revised and updated to include two new chapters on thermodynamic property relations, and the statistical interpretation of entropy. Problems with numerical answers are included at the end of each chapter. As a guide, instructors can use the examples and problems in tutorials, quizzes and examinations. Request Inspection Copy
Heat and Mass Transfer Data Book - KOTHANDARAMAN 1977-01-01

Heat and Mass Transfer - Sawhney 2008
Written with the third-year engineering students of undergraduate level in mind, this well set out textbook explains the fundamentals of Heat and Mass Transfer. Written in question-answer form, the book is precise and easy to understand. The book presents an exhaustive coverage of the theory, definitions, formulae and expenses which are well supported by plenty of diagrams and problems in order to make the underlying principles more comprehensive.
Heat and Mass Transfer - D S Kumar 2008

Heat and Mass Transfer : A Textbook for the

Students Preparing for B.E., B.Tech., B.Sc. Engg., AMIE, UPSC (Engg. Services) and GATE Examinations - R. K. Rajput 2007

The entire book has been thoroughly revised and a large number of solved examples under heading Additional/Typical Worked Examples (Questions selected from various Universities and Competitive Examinations) have been added at the end of the book.

Hydrodynamics, Mass and Heat Transfer in Chemical Engineering - Andrei D. Polyanin 2001-09-27

Hydrodynamics, Mass and Heat Transfer in Chemical Engineering contains a concise and systematic exposition of fundamental problems of hydrodynamics, heat and mass transfer, and physicochemical hydrodynamics, which constitute the theoretical basis of chemical engineering in science. Areas covered include: fluid flows; processes of chemical engineering; mass and heat transfer in plane channels, tubes and fluid films; problems of mass and heat transfer; the motion and mass exchange of power-law and viscoplastic fluids through tubes, channels, and films; and the basic concepts and properties of very specific technological media, namely foam systems. Topics are arranged in increasing order of difficulty, with each section beginning with a brief physical and mathematical statement of the problem considered, followed by final results, usually given for the desired variables in the form of final relationships and tables.

Compact Heat Exchangers - C. Ranganayakulu

2018-04-30

A comprehensive source of generalized design data for most widely used fin surfaces in CHEs Compact Heat Exchanger Analysis, Design and Optimization: FEM and CFD Approach brings new concepts of design data generation numerically (which is more cost effective than generic design data) and can be used by design and practicing engineers more effectively. The numerical methods/techniques are introduced for estimation of performance deteriorations like flow non-uniformity, temperature non-uniformity, and longitudinal heat conduction effects using FEM in CHE unit level and Colburn j factors and Fanning friction f factors data generation method for various types of CHE fins using CFD. In addition, worked examples for single and two-phase flow CHEs are provided and the complete qualification tests are given for CHEs use in aerospace applications. Chapters cover: Basic Heat Transfer; Compact Heat Exchangers; Fundamentals of Finite Element and Finite Volume Methods; Finite Element Analysis of Compact Heat Exchangers; Generation of Design Data by CFD Analysis; Thermal and Mechanical Design of Compact Heat Exchanger; and Manufacturing and Qualification Testing of Compact Heat Exchanger. Provides complete information about basic design of Compact Heat Exchangers Design and data generation is based on numerical techniques such as FEM and CFD methods rather than experimental or analytical ones Intricate design aspects included, covering complete cycle of design, manufacturing, and qualification of a Compact Heat Exchanger Appendices on basic essential fluid properties, metal characteristics, and derivation of Fourier series mathematical equation Compact Heat Exchanger Analysis, Design and Optimization: FEM and CFD Approach is ideal for senior undergraduate and graduate students studying equipment design and heat exchanger design.

Greenhouse Technology for Controlled Environment - G. N. Tiwari 2003

A current and invaluable source for agricultural scientists, researchers, vegetable growers and professional entrepreneurs enabling them to understand the fundamentals of greenhouse technology applicable to vegetable production, crop drying, poultry farms, space heating etc.

Imparts systematic information about the historical background, importance and reviews work in a global perspective. It provides design, construction, instrumentation and error analysis in greenhouse. The basic tools like knowledge of solar energy, solar fraction and heat transfer has also been elaborated upon, as well as different heating / cooling concepts used to control a favorable environment condition inside greenhouses, including information on constituents of inside environment, root media, various crop production, thermal modeling, energy analysis and economic aspects of greenhouse technology.

Heat and Mass Transfer - Kurt Rolle 2015-01-01

Thoroughly up-to-date and packed with real world examples that apply concepts to engineering practice, HEAT AND MASS TRANSFER, 2e, presents the fundamental concepts of heat and mass transfer, demonstrating their complementary nature in engineering applications. Comprehensive, yet more concise than other books for the course, the Second Edition provides a solid introduction to the scientific, mathematical, and empirical methods for treating heat and mass transfer phenomena, along with the tools needed to assess and solve a variety of contemporary engineering problems. Practical guidance throughout helps students learn to anticipate the reasonable answers for a particular system or process and understand that there is often more than one way to solve a particular problem. Especially strong coverage of radiation view factors sets the book apart from other texts available for the course, while a new emphasis on renewable energy and energy efficiency prepares students for engineering practice in the 21st century. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Engineering Materials - RK Rajput 2008

The book has been thoroughly revised. Several new articles have been added, specifically, in chapters in mortar, Concrete, Paint: Varnishes, Distempers and Antitermite treatment to make the book to still more comprehensive and a useful unit for the students preparing for the examination in the subject.

Fundamentals of Rocket Propulsion - DP Mishra

2017-07-20

The book follows a unified approach to present the basic principles of rocket propulsion in concise and lucid form. This textbook comprises of ten chapters ranging from brief introduction and elements of rocket propulsion, aerothermodynamics to solid, liquid and hybrid propellant rocket engines with chapter on electrical propulsion. Worked out examples are also provided at the end of chapter for understanding uncertainty analysis. This book is designed and developed as an introductory text on the fundamental aspects of rocket propulsion for both undergraduate and graduate students. It is also aimed towards practicing engineers in the field of space engineering. This comprehensive guide also provides adequate problems for audience to understand intricate aspects of rocket propulsion enabling them to design and develop rocket engines for peaceful purposes.

Particles, Bubbles and Drops -

Engineering Heat Transfer - Mahesh M. Rathore
2011-08-24

Engineering Science & Technology

Silica Aerogel Composites - Mahesh Sachithanadam 2016-01-13

This book explores the improvement in thermal insulation properties of protein-based silica aerogel composites fabricated by a novel, inexpensive and feasible method. The resulting material exhibits polymeric foam behavior including high compressibility, super-hydrophobic qualities and excellent strain recovery in addition to low thermal conductivity. The fabrication methodologies are explained in great detail and represented in flowcharts for easy reference and understanding. This monograph gives readers a new perspective on composite fabrication using methods other than the traditional ones and explores the endless ways of altering the composition to modify the properties of the silica aerogel composites. Applications for this novel composite are diverse and range from those in the pharmaceutical and aerospace industries to the oil and gas industries.

Elements of Mechanical Engineering (PTU) - Sadhu Singh 2009

The present book on Elements of Mechanical

Engineering is meant for the engineering students of all branches at their first year level. It covers the new syllabus of Panjab Technical University, Jalandhar. However, it shall be useful to students of other Universities also. The book covers the basic principles of Thermodynamics, zeroth law of Thermodynamics and the concept of temperature in the first chapter.

Thermal Engineering - MAHESH M. RATHORE 2010

Fundamentals of Engineering Heat and Mass Transfer - R. C. Sachdeva 2009-01-01

This text is meant to fill a long felt need for a comprehensive and authoritative book on heat and mass transfer for students of Mechanical/Chemical/Aeronautical/Production/Metallurgical engineering. The dual objective of understanding the physical phenomena involved and the ability to formulate and solve typical problems by an average student has been kept in mind while writing this book. In this text, an effort has been made to identify the similarities in both qualitative and quantitative approach, between heat transfer and mass transfer. This gives a better understanding of the phenomena of mass transfer. The subject matter has been developed to a sufficiently advanced stage in a logical and coherent manner with neat illustrations along with an adequate number of solved examples. A large number of problems (with answers) at the end of each chapter assist in the pedagogy. The book has been appended with a set of selected MCQs. The role of experimentation in the teaching of Heat and Mass Transfer is well established. Properly designed experiments reinforce the teaching of basic principles more thoroughly. Keeping this in mind one full chapter comprising 12 typical experiments forms another special feature of this text. Contents: Basic Concepts Fundamental Equations of Conduction One-Dimensional Steady State Heat Conduction Multi-Dimensional Steady State Conduction Transient Heat Conduction Fundamentals of Convective Heat Transfer Forced Convection Systems Natural Convection Thermal Radiation - Basic Relations Radiative Heat Exchange Between Surfaces Boiling and Condensation Heat Exchangers Diffusion Mass Transfer Convective Mass

Transfer Experiments in Engineering Heat and Mass Transfer.

Advances in Interdisciplinary Engineering - Mukul Kumar 2020-08-14

This book presents select proceedings of the International Conference on Future Learning Aspects of Mechanical Engineering (FLAME 2018). The book discusses interdisciplinary areas such as automobile engineering, mechatronics, applied and structural mechanics, bio-mechanics, biomedical instrumentation, ergonomics, biodynamic modeling, nuclear engineering, agriculture engineering, and farm machineries. The contents of the book will benefit both researchers and professionals.

Recent Developments of Nanofluids - Rahmat Ellahi (Ed.)

Hydrocarbon Processing - 1988

September 1, 2021-: "Since 1922, management and technical professionals from petroleum refining, gas processing, petrochemical/chemical and engineer/constructor companies throughout the world have turned to Hydrocarbon Processing for high quality technical and operating information. Through its monthly magazine, website and e-newsletters, Hydrocarbon Processing covers technological advances, processes and optimization developments from throughout the global Hydrocarbon Processing Industry (HPI). Hydrocarbon Processing editors and writers provide real-world case studies and practical information that readers can use to improve their companies' operations and their own professional job skills."--taken from publisher web site.

Recent Trends in Thermal Engineering - L. M. Das 2021-09-15

This book presents select proceedings of the 3rd International Conference on Computational and Experimental Methods in Mechanical Engineering (ICCEMME 2021). It gives an overview of recent developments in the field of fluid dynamics and thermal engineering. Topics covered include case studies in thermal engineering, combustion engines, computational fluid dynamics (cfD), cooling systems, energy conservation, energy conversion, renewable energy, bio fuels, gas turbines, heat exchangers and heat transfer systems, heat pipes and

pumps, heat transfer augmentation, refrigeration and HVAC systems, fluids engineering, energy and process, and thermal power plants. The book will be useful for researchers and professionals working in the area of thermal engineering and allied fields.

Hybrid Nanofluids - Zafar Said 2022-01-21

Hybrid Nanofluids: Preparation, Characterization and Applications presents the history of hybrid nanofluids, preparation techniques, thermoelectrical properties, rheological behaviors, optical properties, theoretical modeling and correlations, and the effect of all these factors on potential applications, such as solar energy, electronics cooling, heat exchangers, machining, and refrigeration. Future challenges and future work scope have also been included. The information from this book enables readers to discover novel techniques, resolve existing research limitations, and create novel hybrid nanofluids which can be implemented for heat transfer applications. Describes the characterization, thermophysical and electrical properties of nanofluids Assesses parameter selection and property measurement techniques for the calibration of thermal performance Provides information on theoretical models and correlations for predicting hybrid nanofluids properties from experimental properties

Heat and Mass Transfer - R. Rudramoorthy 2010

Energy and Exergy for Sustainable and Clean Environment, Volume 2 - V. Edwin Geo 2022-09-16

This multi-disciplinary book presents the most recent advances in exergy, energy, and environmental issues. Volume 2 focuses on fundamentals in the field and covers current problems, future needs, and prospects in the area of energy and environment from researchers worldwide. Based on some selected lectures from the Eleventh International Exergy, Energy and Environmental Symposium (IEEES-11) and complemented by further invited contributions, this comprehensive set of contributions promote the exchange of new ideas and techniques in energy conversion and conservation in order to exchange best practices in "energetic efficiency." Included are

fundamental and historical coverage of the green transportation and sustainable mobility sectors, especially regarding the development of sustainable technologies for thermal comforts and green transportation vehicles. Furthermore, contributions on renewable and sustainable energy sources, strategies for energy production, and the carbon-free society constitute an important part of this book.

Materials Science - RS Khurmi | RS Sedha 2008

We take an opportunity to present 'Material Science' to the students of A.M.I.E.(I) Diploma stream in particular, and other engineering students in general. The object of this book is to present the subject matter in a most concise, compact, to the point and lucid manner. While preparing the book, we have constantly kept in mind the requirements of A.M.I.E(I) students, regarding the latest trend of their examination. To make it really useful for the A.M.I.E.(I) students, the solutions of their complete examination has been written in an easy style, with full detail and illustrations.

Engineering Heat and Mass Transfer - Mahesh M. Rathore 2006-09

Fundamentals of Thermodynamics - Claus Borgnakke 2014

Advances in the Homotopy Analysis Method - Shijun Liao 2013-11-26

Unlike other analytic techniques, the Homotopy Analysis Method (HAM) is independent of small/large physical parameters. Besides, it provides great freedom to choose equation type and solution expression of related linear high-order approximation equations. The HAM provides a simple way to guarantee the convergence of solution series. Such uniqueness differentiates the HAM from all other analytic approximation methods. In addition, the HAM can be applied to solve some challenging problems with high nonlinearity. This book, edited by the pioneer and founder of the HAM, describes the current advances of this powerful analytic approximation method for highly nonlinear problems. Coming from different countries and fields of research, the authors of each chapter are top experts in the HAM and its applications. Contents: Chance and Challenge: A

Brief Review of Homotopy Analysis Method (S-J Liao) Predictor Homotopy Analysis Method (PHAM) (S Abbasbandy and E Shivanian) Spectral Homotopy Analysis Method for Nonlinear Boundary Value Problems (S Motsa and P Sibanda) Stability of Auxiliary Linear Operator and Convergence-Control Parameter (R A Van Gorder) A Convergence Condition of the Homotopy Analysis Method (M Turkyilmazoglu) Homotopy Analysis Method for Some Boundary Layer Flows of Nanofluids (T Hayat and M Mustafa) Homotopy Analysis Method for Fractional Swift-Hohenberg Equation (S Das and K Vishal) HAM-Based Package NOPH for Periodic Oscillations of Nonlinear Dynamic Systems (Y-P Liu) HAM-Based Mathematica Package BVPh 2.0 for Nonlinear Boundary Value Problems (Y-L Zhao and S-J Liao) Readership: Graduate students and researchers in applied mathematics, physics, nonlinear mechanics, engineering and finance. Keywords: Analytic Approximation Method; Nonlinear; Homotopy; Applied Mathematics Key Features: The method described in the book can overcome almost all restrictions of other analytic approximation method for nonlinear problems This book is the first in homotopy analysis method, covering the newest advances, contributed by many top experts in different fields

Engineering Turbulence Modelling and Experiments 6 - Wolfgang Rodi 2005-05-05 Proceedings of the world renowned ERCOFTAC (International Symposium on Engineering Turbulence Modelling and Measurements). The proceedings include papers dealing with the following areas of turbulence: · Eddy-viscosity and second-order RANS models · Direct and large-eddy simulations and deductions for conventional modelling · Measurement and visualization techniques, experimental studies · Turbulence control · Transition and effects of curvature, rotation and buoyancy on turbulence · Aero-acoustics · Heat and mass transfer and chemically reacting flows · Compressible flows, shock phenomena · Two-phase flows · Applications in aerospace engineering, turbomachinery and reciprocating engines, industrial aerodynamics and wind engineering, and selected chemical engineering problems Turbulence remains one of the key issues in

tackling engineering flow problems. These problems are solved more and more by CFD analysis, the reliability of which depends strongly on the performance of the turbulence models employed. Successful simulation of turbulence requires the understanding of the complex physical phenomena involved and suitable models for describing the turbulent momentum, heat and mass transfer. For the understanding of turbulence phenomena, experiments are indispensable, but they are equally important for providing data for the development and testing of turbulence models and hence for CFD software validation. As in other fields of Science, in the rapidly developing discipline of turbulence, swift progress can be achieved only by keeping up to date with recent advances all over the world and by exchanging ideas with colleagues active in related fields.

An Introduction to Computational Fluid Dynamics The Finite Volume Method, 2/e - Versteeg 2007

Fundamentals of Heat and Mass Transfer - Theodore L. Bergman 2012-02-01

This bestselling book in the field provides a complete introduction to the physical origins of heat and mass transfer. Noted for its crystal clear presentation and easy-to-follow problem solving methodology, Incropera and Dewitt's systematic approach to the first law develops reader confidence in using this essential tool for thermal analysis. Readers will learn the meaning of the terminology and physical principles of heat transfer as well as how to use requisite inputs for computing heat transfer rates and/or material temperatures.

Compr. Engineering Heat Transfer - Mahesh M. Rathore 2000

Innovations in Mechanical Engineering - G. S. V. L. Narasimham 2022-03-03

This book comprises select proceedings of the International Conference on Innovations in Mechanical Engineering (ICIME 2021). It presents innovative ideas and new findings in the field of mechanical engineering. Various topics covered in this book are aerospace engineering, automobile engineering, thermal engineering, renewable energy sources, bio-mechanics, fluid mechanics, MEMS,

mechatronics, robotics, CAD/CAM, CAE, CFD, design and optimization, tribology, materials engineering and metallurgy, mimics, surface engineering, nanotechnology, polymer science, manufacturing, production management, industrial engineering and rapid prototyping. This book will be useful for the students, researchers and professionals working in the various areas of mechanical engineering.

Recent Developments of Nanofluids - Rahmat Ellahi 2018-06

Recent Developments of Nanofluids.
Thermal Engineering - R.K. Rajput 2005

Applications of Mathematical Heat Transfer and Fluid Flow Models in Engineering and Medicine - Abram S. Dorfman 2017-02-06

Applications of mathematical heat transfer and fluid flow models in engineering and medicine Abram S. Dorfman, University of Michigan, USA

Engineering and medical applications of cutting-edge heat and flow models This book presents innovative efficient methods in fluid flow and heat transfer developed and widely used over the last fifty years. The analysis is focused on mathematical models which are an essential part of any research effort as they demonstrate the validity of the results obtained. The universality of mathematics allows consideration of engineering and biological problems from one point of view using similar models. In this book, the current situation of applications of modern mathematical models is outlined in three parts. Part I offers in depth coverage of the applications of contemporary conjugate heat transfer models in various industrial and technological processes, from aerospace and nuclear reactors to drying and food processing. In Part II the theory and application of two recently developed models in fluid flow are considered: the similar conjugate model for simulation of biological systems, including flows in human organs, and applications of the latest developments in turbulence simulation by direct solution of Navier-Stokes equations, including flows around aircraft. Part III proposes fundamentals of laminar and turbulent flows and applied mathematics methods. The discussion is complimented by 365 examples selected from a list of 448 cited papers, 239 exercises and 136 commentaries. Key features: Peristaltic flows in

normal and pathologic human organs. Modeling flows around aircraft at high Reynolds numbers. Special mathematical exercises allow the reader to complete expressions derivation following directions from the text. Procedure for preliminary choice between conjugate and common simple methods for particular problem solutions. Criteria of conjugation, definition of semi-conjugate solutions. This book is an ideal reference for graduate and post-graduate students and engineers.

Introduction to Fluid Mechanics - William S. Janna 1993

This book provides readers with an understanding of the theory, concepts and applications of fluid mechanics.

Drop Dynamics and Dropwise Condensation on Textured Surfaces - Sameer Khandekar 2020-09-11

This book is an expanded form of the monograph, Dropwise Condensation on Inclined Textured Surfaces, Springer, 2013, published earlier by the authors, wherein a mathematical model for dropwise condensation of pure vapor over inclined textured surfaces was presented, followed by simulations and comparison with experiments. The model factored in several details of the overall quasi-cyclic process but approximated those at the scale of individual drops. In the last five years, drop level dynamics over hydrophobic surfaces have been extensively studied. These results can now be incorporated in the dropwise condensation model. Dropwise condensation is an efficient route to heat transfer and is often encountered in major power generation applications. Drops are also formed during condensation in distillation devices that work with diverse fluids ranging from water to liquid metals. Design of such equipment requires careful understanding of the condensation cycle, starting from the birth of nuclei, followed by molecular clusters, direct growth of droplets, their coalescence, all the way to instability and fall-off of condensed drops. The model described here considers these

individual steps of the condensation cycle. Additional discussions include drop shape determination under static conditions, a fundamental study of drop spreading in sessile and pendant configurations, and the details of the drop coalescence phenomena. These are subsequently incorporated in the condensation model and their consequences are examined. As the mathematical model is spread over multiple scales of length and time, a parallelization approach to simulation is presented. Special topics include three-phase contact line modeling, surface preparation techniques, fundamentals of evaporation and evaporation rates of a single liquid drop, and measurement of heat transfer coefficient during large-scale condensation of water vapor. We hope that this significantly expanded text meets the expectations of design engineers, analysts, and researchers working in areas related to phase-change phenomena and heat transfer.

Elements of Mechanical Engineering - Mahesh Kumar 2013-07-30

Aimed at first year engineering students, this text includes coverage of properties of steam and boilers; steam turbines and condensers; internal combustion engines and gas turbines; water turbines, pumps, and hydraulic devices; simple lifting machines; power transmission methods and devices; stresses and strains; and shear force and bending moment.

Fundamentals of the Finite Element Method for Heat and Mass Transfer - Perumal Nithiarasu 2016-03-07

Fundamentals of the Finite Element Method for Heat and Mass Transfer, Second Edition is a comprehensively updated new edition and is a unique book on the application of the finite element method to heat and mass transfer. • Addresses fundamentals, applications and computer implementation • Educational computer codes are freely available to download, modify and use • Includes a large number of worked examples and exercises • Fills the gap between learning and research