

Engineering Heat Transfer Gupta Prakash

This book presents the outcomes of the International Conference on Intelligent Manufacturing and Automation (ICIMA 2018) organized by the Departments of Mechanical Engineering and Production Engineering at Dwarkadas J. Sanghvi College of Engineering, Mumbai, and the Indian Society of Manufacturing Engineers. It includes original research and the latest advances in the field, focusing on automation, mechatronics and robotics; CAD/CAM/CAE/CIM/FMS in manufacturing; product design and development; DFM/DFA/FMEA; MEMS and Nanotechnology; rapid prototyping; computational techniques; industrial engineering; manufacturing process management; modelling and optimization techniques; CRM, MRP and ERP; green, lean, agile and sustainable manufacturing; logistics and supply chain management; quality assurance and environment protection; advanced material processing and characterization; and composite and smart materials.

Renewable Energy Engineering and Technology: Principles and Practice - covers major renewable energy resources and technologies for various applications. The book is conceived as a standard reference book for students, experts, and policy-makers. It has been designed to meet the needs of these diverse groups. While covering the basics of scientific and engineering principles of thermal engineering, heat and mass transfer, fluid dynamics, and renewable energy resource assessments, the book further deals with the basics of applied technologies and design practices for following renewable energy resources.- Solar (thermal and photovoltaic)- Wind - Bio-energy including liquid biofuels and municipal solid waste- Other renewables such as tidal, wave, and geothermalThe book is designed to fulfil the much-awaited need for a handy, scientific, and easy-to-understand comprehensive handbook for design professionals and students of renewable energy engineering courses. Besides the sheer breadth of the topics covered, what makes this well-researched book different from earlier attempts is the fact that this is based on extensive practical experiences of the editor and the authors. Thus, a lot of emphasis has been placed on system sizing and integration. Ample solved examples using data for India make this book a relevant and an authentic reference.

Papers presented at the conference.

This textbook presents the classical treatment of the problems of heat transfer in an exhaustive manner with due emphasis on understanding of the physics of the problems. This emphasis is especially visible in the chapters on convective heat transfer. Emphasis is laid on the solution of steady and unsteady two-dimensional heat conduction problems. Another special feature of the book is a chapter on introduction to design of heat exchangers and their illustrative design problems. A simple and understandable treatment of gaseous radiation has been presented. A special chapter on flat plate solar air heater has been incorporated that covers thermo-hydraulic modeling and simulation. The chapter on mass transfer has been written looking specifically at the needs of the students of mechanical engineering. The book includes a large number and variety of solved problems with supporting line diagrams. The author has avoided duplicating similar problems, while incorporating more application-based examples. All the end-of-chapter exercise problems are supplemented with stepwise answers. Primarily designed to serve as a complete textbook for

undergraduate and graduate students of mechanical engineering, the book will also be useful for students of chemical, automobile, production, and industrial engineering streams. The book fully covers the topics of heat transfer coursework and can also be used as reference for students preparing for competitive graduate examinations. Heat Transfer Engineering: Fundamentals and Techniques reviews the core mechanisms of heat transfer and provides modern methods to solve practical problems encountered by working practitioners, with a particular focus on developing engagement and motivation. The book reviews fundamental concepts in conduction, forced convection, free convection, boiling, condensation, heat exchangers and mass transfer succinctly and without unnecessary exposition. Throughout, copious examples drawn from current industrial practice are examined with an emphasis on problem-solving for interest and insight rather than the procedural approaches often adopted in courses. The book contains numerous important solved and unsolved problems, utilizing modern tools and computational sources wherever relevant. A subsection on common issues and recent advances is presented in each chapter, encouraging the reader to explore a greater diversity of problems. Reveals physical solutions alongside their application in practical problems, with an aim of generating interest from reality rather than dry exposition Reviews pertinent, contemporary computational tools, including emerging topics such as machine learning Describes the complexity of modern heat transfer in an engaging and conversational style, greatly adding to the uniqueness and accessibility of the book

Microfabrication and precision engineering is an increasingly important area relating to metallic, polymers, ceramics, composites, biomaterials and complex materials. Micro-electro-mechanical-systems (MEMS) emphasize miniaturization in both electronic and mechanical components. Microsystem products may be classified by application, and have been applied to a variety of fields, including medical, automotive, aerospace and alternative energy. Microsystems technology refers to the products as well as the fabrication technologies used in production. With detailed information on modelling of micro and nano-scale cutting, as well as innovative machining strategies involved in microelectrochemical applications, microchannel fabrication, as well as underwater pulsed Laser beam cutting, among other techniques, Microfabrication and Precision Engineering is a valuable reference for students, researchers and professionals in the microfabrication and precision engineering fields. Contains contributions by top industry experts Includes the latest techniques and strategies Special emphasis given to state-of-the art research and development in microfabrication and precision engineering

Advances in Civil Engineering and Building Materials presents the state-of-the-art development in: - Structural Engineering - Road & Bridge Engineering- Geotechnical Engineering- Architecture & Urban Planning- Transportation Engineering- Hydraulic Engineering - Engineering Management- Computational Mechanics- Construction Technology- Buildi

Fundamentals of Heat and Mass Transfer is written for senior undergraduates in engineering colleges of Indian universities, in the departments of Mechanical,

Automobile, Production, Chemical, Nuclear and Aerospace Engineering. The book should also

This book is meant for diploma students of chemical engineering and petroleum engineering both for their academic programmes as well as for competitive examination. This book Contains 18 chapters covering the entire syllabus of diploma course in chemical engineering and petrochemical engineering. This book in its present form has been designed to serve as an encyclopedia of chemical engineering so as to be ready reckoner apart from being useful for all types of written tests and interviews faced by chemical engineering and petrochemical engineering diploma students of the country. Since branch related subjects of petrochemical engineering are same as that of chemical engineering diploma students, so this book will be equally useful for diploma in petrochemical engineering students.

This book presents the select proceedings of the 3rd International Conference on Computational and Experimental Methods in Mechanical Engineering (ICCEMME 2020). The book discusses the recent researches and concrete findings in the field of mechanical design and automation with its allied branches. Various topics covered in this book include modeling and simulation, application of modelling to complex real-world systems, application of machine or deep learning in mechanical problems, artificial intelligence, vehicle design, robotics, vehicle dynamics and control, biomechanics, and vibration-related problems. Given its content, the book will be useful for beginners, researchers, and professionals interested in the field of mechanical engineering. .

This book gathers selected contributions in the field of civil and construction engineering, as presented by international researchers and engineers at the 2nd International Scientific Conference on Socio-Technical Construction and Civil Engineering (STCCE), held in Kazan, Russia on April 21-28 2021. The book covers a wide range of topics including building constructions and structures, bridges, roads and tunnels, building materials and products, construction management, energy efficiency and thermal protection of buildings, ventilation, air conditioning, gas supply and lighting in buildings, innovative and smart technologies in construction, sustainable development, transport system development. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations. Naturally burning coal fires and those ignited by human activities receive little attention from the media compared to other environmental hazards, but their study is gaining ground. Here, the world's leading experts present their research findings covering topics such as the gases generated in underground coal fires, the origin of gas-vent minerals and land-cover changes due to coal fires.

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Bubbles, Drops, and Particles in Non-Newtonian Fluids, Second Edition continues to provide thorough coverage of the scientific foundations and the latest advances in

particle motion in non-Newtonian media. The book demonstrates how dynamic behavior of single particles can yield useful information for modeling transport processes in complex multiphase flows. Completely revised and expanded, this second edition covers macroscopic momentum and heat/mass transfer from a single rigid or fluid particle or ensembles of particles involving strong inter-particle interactions including packed beds, fluidized beds, and porous media with different types of non-Newtonian fluids. It reflects advances made since the publication of the previous, bestselling edition with new material on topics such as extensional flow; time-independent, time-dependent and visco-elastic fluids; free settling behavior of non-spherical particles; and particle motion in visco-elastic and visco-plastic fluids, boundary layer flows, flows in porous media, and falling object rheometry. An excellent reference and handbook dealing with the technological aspects of non-Newtonian materials encountered in nature and in technology, this book highlights qualitative differences between the response of a Newtonian and non-Newtonian fluids in the complex flows encountered in processing applications.

Fluid-Solid Reactions, Second Edition takes a detailed and thorough look at the scope of fluid-solid reaction systems, focusing on the four phenomena: external mass transfer, pore diffusion, chemical reaction, and adsorption/desorption. This completely revised new edition builds on the classic original edition through the introduction of cutting-edge new theories and applications, including the formulation and application of a new and convenient law that governs fluid-solid reaction kinetics. This book will be of primary interest to practicing engineers engaged in process research, development, and design in the many fields where fluid-solid reactions are critical to workflow and research. Fluid-solid reactions play a major role in the technology of most industrialized nations. These reactions encompass a very broad field, including the extraction of metals from their ores, the combustion of solid fuels, coal gasification, and the incineration of solid refuse. Features 50% new and revised content, arming researchers with the latest developments in the field Details a new unified approach to modeling the rates of fluid-solid reaction systems Authored by one of the world's foremost experts on fluid-solid reactions and their applications in the field

This book presents the select proceedings of the International Conference on Functional Material, Manufacturing and Performances (ICFMMP) 2019. The book covers broad aspects of several topics involved in the metrology and measurement of engineering surfaces and their implementation in automotive, bio-manufacturing, chemicals, electronics, energy, construction materials, and other engineering applications. The contents focus on cutting-edge instruments, methods and standards in the field of metrology and mechanical properties of advanced materials. Given the scope of the topics, this book can be useful for students, researchers and professionals interested in the measurement of surfaces, and the applications thereof.

Never before has so much ground been covered in a single volume reference source. This five-part work is sure to be of great value to students, technicians and practicing engineers as well as equipment designers and manufacturers, and should become their one-stop shop for all information needs in this subject area. This book will be of interest to those working with: Static Drives, Static Controls of Electric Motors, Speed Control of Electric Motors, Soft Starting, Fluid Coupling, Wind Mills, Generators, Painting procedures, Effluent treatment, Electrostatic Painting, Liquid Painting, Instrument

Transformers, Core Balanced CTs, CTs, VTs, Current Transformers, Voltage Transformers, Earthquake engineering, Seismic testing, Seismic effects, Cabling, Circuit Breakers, Switching Surges, Insulation Coordination, Surge Protection, Lightning, Over-voltages, Ground Fault Protections, Earthing, Earth fault Protection, Shunt Capacitors, Reactive control, Bus Systems, Bus Duct, & Rising mains *A 5-part guide to all aspects of electrical power engineering *Uniquely comprehensive coverage of all subjects associated with power engineering *A one-stop reference resource for power drives, their controls, power transfer and distribution, reactive controls, protection (including over voltage and surge protection), maintenance and testing electrical engineering

Papers recommended by the institute's various committees for conference presentation.

This book presents the selected peer-reviewed proceedings of the International Conference on Innovative Engineering Design (ICOIED 2020). The contents provide a multidisciplinary approach for the development of innovative product design and their benefits for the society. The book presents latest advances in various fields like design process, service development, micro/nano technology, sensors and MEMS, and sustainability in engineering design. This book can be useful for students, researchers, and professionals interested in innovative product/process design and development. Transport Phenomena in Dispersed Media addresses the main problems associated with the transfer of heat, mass and momentum. The authors focus on the analytical solutions of the mass and heat transfer equations; the theoretical problems of coalescence, coagulation, aggregation and fragmentation of dispersed particles; the rheology of structured aggregate and kinetically stable disperse systems; the precipitation of particles in a turbulent flow; the evolution of the distribution function; the stochastic counterpart of the mass transfer equations; the dissipation of energy in disperse systems; and many other problems that distinguish this book from existing publications. Key Selling Features Covers all technological processes taking place in the oil and gas complex, as well as in the petrochemical industry Presents new original solutions for calculating design as well as for the development and implementation of processes of chemical technology Organized to first provide an extensive review of each chapter topic, solve specific problems, and then review the solutions with the reader Contains complex mathematical expressions for practical calculations Compares results obtained on the basis of mathematical models with experimental data In the present book, nanofluid heat and mass transfer in engineering problems are investigated. The use of additives in the base fluid like water or ethylene glycol is one of the techniques applied to augment heat transfer. Newly, innovative nanometer-sized particles have been dispersed in the base fluid in heat transfer fluids. The fluids containing the solid nanometer-sized particle dispersion are called "nanofluids." At first, nanofluid heat and mass transfer over a stretching sheet are provided with various boundary conditions. Problems faced for simulating nanofluids are reported. Also, thermophysical properties of various nanofluids are presented. Nanofluid flow and heat transfer in the presence of magnetic field are investigated. Furthermore, applications for electrical and biomedical engineering are provided. Besides, applications of nanofluid in internal combustion engine are provided. Volume is indexed by Thomson Reuters CPCI-S (WoS). These proceedings comprise fully-refereed papers presented at the conference. The main conference theme was Mechanical and Aerospace Engineering, and the main goal of the event was to provide an international

scientific forum for the exchange of new ideas in a number of fields and for in-depth discussions with peers from around the world. Core areas of mechanical and aerospace engineering are covered, together with multidisciplinary, interdisciplinary research and applications; thus making the work an excellent guide to those topics.

Intended as a textbook for undergraduate courses in heat transfer for students of mechanical, chemical, aeronautical, and metallurgical engineering, or as a reference for professionals in industry, this book emphasizes the clear understanding of theoretical concepts followed by practical applications. Treating each subject analytically and then numerically, it provides step-by-step solutions of numerical problems through the use of systematic procedures by a prescribed format. With more than a million users in industry, MATLAB is the most popular computing programming language among engineers. This Second Edition has been updated to include discussions on how to develop programs that solve heat transfer problems using MATLAB, which allows the student to rapidly develop programs that involve complex numerical and engineering heat transfer computations.

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