Computational Heat Transfer Engineer

RCA EngineerNumerical Heat Transfer and Fluid FlowComputational Fluid DynamicsIntroduction to Engineering Heat TransferNumerical Heat Transfer and Fluid FlowHeat TransferExperimentation, Validation, and Uncertainty Analysis for EngineersThe Finite Element Method in Heat Transfer and Fluid Dynamics, Third EditionHeat TransferGas Turbine Heat Transfer and Cooling TechnologyPrinciples of Convective Heat TransferComputational Heat Transfer, The Finite Difference MethodologyIntroduction to Computational Mass TransferCombustion and FireStandard for Verification and Validation in Computational Fluid Dynamics and Heat TransferComputational Fluid Mechanics and Heat TransferComputational Modeling of Pulverized Coal Fired BoilersComputation of Conduction and Duct Flow Heat TransferComputational Fluid Dynamics for EngineersFundamentals of Convective Heat TransferComputational Analysis of Heat Transfer in Fluids and SolidsHeat Transfer EngineeringSelected Topics of Computational and Experimental Fluid MechanicsComputational Fluid Dynamics and Heat TransferComputational Heat Transfer, Mathematical ModellingComputational Fluid Mechanics and Heat Transfer, Second EditionComputational Techniques For Chemical EngineersBenchmark Problems for Heat Transfer CodesHeat TransferFirst U.K. National Conference on Heat TransferComputational Fluid Dynamics for EngineersComputational Heat TransferIntroduction to Computational Mass TransferHeat and Mass TransferTurbomachinery Fluid Dynamics and Heat

TransferComputational Methods for Heat and Mass TransferComputational Aspects of Heat Transfer Benchmark ProblemsNaval Engineers JournalDiscontinuous Finite Elements in Fluid Dynamics and Heat TransferFundamentals of the Finite Element Method for Heat and Mass Transfer

RCA Engineer

This concise and unified text reviews recent contributions to the principles of convective heat transfer for single and multi-phase systems. This valuable new edition has been updated throughout and contains new examples and problems.

Numerical Heat Transfer and Fluid Flow

First U.K. National Conference on Heat Transfer, Volume 1, documents the proceedings of the conference organized by the U.K. National Committee for Heat Transfer—a joint committee of the Institutions of Chemical and Mechanical Engineers and includes a member nominated by the Heat Transfer Society—held at the University of Leeds, on 3-5 July 1984. It is intended that the Leeds conference will be the first of a series of UK National Conferences which will be held at four-yearly intervals (1984, 1988, 1992 etc). Thus, for people working in the heat transfer field there will be an opportunity to present and discuss their work at a

major conference every two years. This volume contains 55 papers that are presented during Sessions 1-10. The papers in Session 1 deal with post dry-out and drop heat transfer. Session 2 presents studies on the thermal hydraulic aspects of accidents and transients. Session 3 contains papers on the thermal hydraulics of reflood. Session 4 focuses on reactor operational heat transfer while Session 5 deals with AGR and other fuel heat transfer. The presentations in Session 6 cover fouling mechanisms while those in Session 7 focus on fouling detection, inhibition, and control. Session 8 takes up heat transfer in regenerators and fixed beds. Session 9 discusses papers on heat exchange networks. Session 10 contains studies on condensation and condensers.

Computational Fluid Dynamics

Introduction to Engineering Heat Transfer

Numerical Heat Transfer and Fluid Flow

This book presents a new computational methodology called Computational Mass Transfer (CMT). It offers an approach to rigorously simulating the mass, heat and

momentum transfer under turbulent flow conditions with the help of two newly published models, namely the C'2—εC' model and the Reynolds mass flux model, especially with regard to predictions of concentration, temperature and velocity distributions in chemical and related processes. The book will also allow readers to understand the interfacial phenomena accompanying the mass transfer process and methods for modeling the interfacial effect, such as the influences of Marangoni convection and Rayleigh convection. The CMT methodology is demonstrated by means of its applications to typical separation and chemical reaction processes and equipment, including distillation, absorption, adsorption and chemical reactors. Professor Kuo-Tsong Yu is a Member of the Chinese Academy of Sciences. Dr. Xigang Yuan is a Professor at the School of Chemical Engineering and Technology, Tianjin University, China.

Heat Transfer

This comprehensive text provides basic fundamentals of computational theory and computational methods. The book is divided into two parts. The first part covers material fundamental to the understanding and application of finite-difference methods. The second part illustrates the use of such methods in solving different types of complex problems encountered in fluid mechanics and heat transfer. The book is replete with worked examples and problems provided at the end of each chapter.

Experimentation, Validation, and Uncertainty Analysis for Engineers

This book offers an easy-to-understand introduction to the computational mass transfer (CMT) method. On the basis of the contents of the first edition, this new edition is characterized by the following additional materials. It describes the successful application of this method to the simulation of the mass transfer process in a fluidized bed, as well as recent investigations and computing methods for predictions for the multi-component mass transfer process. It also demonstrates the general issues concerning computational methods for simulating the mass transfer of the rising bubble process. This new edition has been reorganized by moving the preparatory materials for Computational Fluid Dynamics (CFD) and Computational Heat Transfer into appendices, additions of new chapters, and including three new appendices on, respectively, generalized representation of the two-equation model for the CMT, derivation of the equilibrium distribution function in the lattice-Boltzmann method, and derivation of the Navier-Stokes equation using the lattice-Boltzmann model. This book is a valuable resource for researchers and graduate students in the fields of computational methodologies for the numerical simulation of fluid dynamics, mass and/or heat transfer involved in separation processes (distillation, absorption, extraction, adsorption etc.), chemical/biochemical reactions, and other related processes.

The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition

This book describes the computer program CONDUCT in terms of its physical, mathematical, and computational details and its application to heat conduction and duct flow problems. It aims to develop students' problem-solving skills as well as enhance their understanding of these physical processes.

Heat Transfer

Gas Turbine Heat Transfer and Cooling Technology

This Third Edition helps you assess and manage uncertainty at all stages of experimentation and validation of simulations In this greatly expanded Third Edition, the acclaimed Experimentation, Validation, and Uncertainty Analysis for Engineers guides readers through the concepts of experimental uncertainty analysis and the applications in validating models and simulations, solving problems experimentally, and characterizing the behavior of systems. This Third Edition presents the current, internationally accepted methodology from ISO, ANSI, and ASME standards to cover the planning, design, debugging, and execution

phases of experiments. Cases in which the experimental result is determined only once or when the result is determined multiple times in a test are addressed and illustrated with examples from the authors' experience. The important practical cases in which multiple measured variables share correlated errors are discussed in detail, and strategies to take advantage of such effects in calibrations and comparative testing situations are presented. The methodology for determining uncertainty by Monte Carlo analysis is described in detail. Knowledge of the material in this Third Edition is a must for those involved in executing or managing experimental programs or validating models, codes, and simulations. Professionals and students in disciplines spanning the full range of engineering and science will find this book an essential guide.

Principles of Convective Heat Transfer

This book, which is published in two volumes, studies heat transfer problems by modern numerical methods. Basic mathematical models of heat transfer are considered. The main approaches, to the analysis of the models by traditional means of applied mathematics are described. Numerical methods for the approximate solution of steady- and unsteady state heat conduction problems are discussed. Investigation of difference schemes is based on the general stability theory. Much emphasis is put on problems in which phase transitions are involved and on heat and mass transfer problems. Problems of controlling and optimizing

heat processes are discussed in detail. These processes are described by partial differential equations, and the main approaches to numerical solution of the optimal control problems involved here are discussed. Aspects of numerical solution of inverse heat exchange problems are considered. Much attention is paid to the most important applied problems of identifying coefficients and boundary conditions for a heat transfer equation. The first volume considered the mathematical models of heat transfer, classic analytical solution methods for heat conduction problems, numerical methods for steady-state and transient heat conduction problems, and phase change problems. In this second volume, we present solution techniques for complicated heat transfer problems (radiation, convection, thermoelasticity, thermal process control and inverse problems) as well as some examples of solving particular heat transfer problems.

Computational Heat Transfer, The Finite Difference Methodology

This book provides engineers with the tools to solve real-world heat transfer problems. It includes advanced topics not covered in other books on the subject. The examples are complex and timely problems that are inherently interesting. It integrates Maple, MATLAB, FEHT, and Engineering Equation Solver (EES) directly with the heat transfer material.

Introduction to Computational Mass Transfer

This festschrift in honor of Professor Budugur Lakshminarayana's 60th birthday-based on the proceedings of a symposium on Turbomachinery Fluid Dynamics and Heat Transfer held recently at The Pennsylvania State University, University Park-provides authoritative and conclusive research results as well as new insights into complex flow features found in the turbomachinery used for propulsion, power, and industrial applications. Explaining in detail compressors, heat transfer fields in turbines, computational fluid dynamics, and unsteady flows, Turbomachinery Fluid Dynamics and Heat Transfer covers: Mixing mechanisms, annulus wall boundary layers, and the flow field in transonic turbocompressors The numerical implementation of turbulence models in a computer code Secondary flows, film cooling, and thermal turbulence modeling The visualization method of modeling using liquid crystals Innovative techniques in the computational modeling of compressor and turbine flows measurement in unsteady flows as well as axial flows and compressor noise generation And much more Generously illustrated and containing key bibliographic citations, Turbomachinery Fluid Dynamics and Heat Transfer is an indispensable resource for mechanical, design, aerospace, marine, manufacturing, materials, industrial, and reliability engineers; and upper-level undergraduate and graduate students in these disciplines.

Combustion and Fire

Computational fluid dynamics, CFD, has become an indispensable tool for many engineers. This book gives an introduction to CFD simulations of turbulence, mixing, reaction, combustion and multiphase flows. The emphasis on understanding the physics of these flows helps the engineer to select appropriate models to obtain reliable simulations. Besides presenting the equations involved, the basics and limitations of the models are explained and discussed. The book combined with tutorials, project and power-point lecture notes (all available for download) forms a complete course. The reader is given hands-on experience of drawing, meshing and simulation. The tutorials cover flow and reactions inside a porous catalyst, combustion in turbulent non-premixed flow, and multiphase simulation of evaporation spray respectively. The project deals with design of an industrial-scale selective catalytic reduction process and allows the reader to explore various design improvements and apply best practice guidelines in the CFD simulations.

Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer

The continuing trend toward miniaturization and high power density electronics

results in a growing interdependency between different fields of engineering. In particular, thermal management has become essential to the design and manufacturing of most electronic systems. Heat Transfer: Thermal Management of Electronics details how engineers can use intelligent thermal design to prevent heat-related failures, increase the life expectancy of the system, and reduce emitted noise, energy consumption, cost, and time to market. Appropriate thermal management can also create a significant market differentiation, compared to similar systems. Since there are more design flexibilities in the earlier stages of product design, it would be productive to keep the thermal design in mind as early as the concept and feasibility phase. The author first provides the basic knowledge necessary to understand and solve simple electronic cooling problems. He then delves into more detail about heat transfer fundamentals to give the reader a deeper understanding of the physics of heat transfer. Next, he describes experimental and numerical techniques and tools that are used in a typical thermal design process. The book concludes with a chapter on some advanced cooling methods. With its comprehensive coverage of thermal design, this book can help all engineers to develop the necessary expertise in thermal management of electronics and move a step closer to being a multidisciplinary engineer.

Computational Fluid Mechanics and Heat Transfer

Thoroughly updated to include the latest developments in the field, this classic text

on finite-difference and finite-volume computational methods maintains the fundamental concepts covered in the first edition. As an introductory text for advanced undergraduates and first-year graduate students, Computational Fluid Mechanics and Heat Transfer, Thi

Computational Modeling of Pulverized Coal Fired Boilers

This book contains invited lectures and selected contributions presented at the Enzo Levi and XIX Annual Meeting of the Fluid Dynamic Division of the Mexican Physical Society in 2013. It is aimed at fourth year undergraduate and graduate students, and scientists in the fields of physics, engineering and chemistry who are interested in fluid dynamics from an experimental and theoretical point of view. The invited lectures are introductory and avoid the use of complicated mathematics. The fluid dynamics applications include multiphase flow, convection, diffusion, heat transfer, rheology, granular material, viscous flow, porous media flow, geophysics and astrophysics. The material contained in the book includes recent advances in experimental and theoretical fluid dynamics and is suitable for both teaching and research.

Computation of Conduction and Duct Flow Heat Transfer

This book focuses on heat and mass transfer, fluid flow, chemical reaction, and other related processes that occur in engineering equipment, the natural environment, and living organisms. Using simple algebra and elementary calculus, the author develops numerical methods for predicting these processes mainly based on physical considerations. Through this approach, readers will develop a deeper understanding of the underlying physical aspects of heat transfer and fluid flow as well as improve their ability to analyze and interpret computed results.

Computational Fluid Dynamics for Engineers

The advent of high-speed computers has encouraged a growing demand for newly graduated engineers to possess the basic skills of computational methods for heat and mass transfer and fluid dynamics. Computational fluid dynamics and heat transfer, as well as finite element codes, are standard tools in the computer-aided design and analysis of processe

Fundamentals of Convective Heat Transfer

Thermal convection is often encountered by scientists and engineers while designing or analyzing flows involving exchange of energy. Fundamentals of Convective Heat Transfer is a unified text that captures the physical insight into

convective heat transfer and thorough, analytical, and numerical treatments. It also focuses on the latest developments in the theory of convective energy and mass transport. Aimed at graduates, senior undergraduates, and engineers involved in research and development activities, the book provides new material on boiling, including nuances of physical processes. In all the derivations, step-by-step and systematic approaches have been followed.

Computational Analysis of Heat Transfer in Fluids and Solids

This new edition updated the material by expanding coverage of certain topics, adding new examples and problems, removing outdated material, and adding a computer disk, which will be included with each book. Professor Jaluria and Torrance have structured a text addressing both finite difference and finite element methods, comparing a number of applicable methods.

Heat Transfer Engineering

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

Selected Topics of Computational and Experimental Fluid Mechanics

Computational Fluid Dynamics and Heat Transfer

This book focuses on heat and mass transfer, fluid flow, chemical reaction, and other related processes that occur in engineering equipment, the natural environment, and living organisms. Using simple algebra and elementary calculus, the author develops numerical methods for predicting these processes mainly based on physical considerations. Through this approach, readers will develop a deeper understanding of the underlying physical aspects of heat transfer and fluid flow as well as improve their ability to analyze and interpret computed results.

Computational Heat Transfer, Mathematical Modelling

Computational Fluid Mechanics and Heat Transfer, Second

Edition

This book provides engineers with the tools to solve real-world heat transfer problems. It includes advanced topics not covered in other books on the subject. The examples are complex and timely problems that are inherently interesting. It integrates Maple, MATLAB, FEHT, and Engineering Equation Solver (EES) directly with the heat transfer material.

Computational Techniques For Chemical Engineers

This book, which is published in two volumes, studies heat transfer problems by modern numerical methods. Basic mathematical models of heat transfer are considered. The main approaches to the analysis of the models by traditional means of applied mathematics are described. Numerical methods for the approximate solution of steady and unsteady-state heat conduction problems are discussed. Investigation of difference schemes is based on the general stability theory. Much emphasis is put on problems in which phase transitions are involved and on heat and mass transfer problems. Problems of controlling and optimizing heat processes are discussed in detail. These processes are described by partial differential equations, and the main approaches to numerical solution of the optimal control problems involved here are discussed. Aspects of numerical

solution of inverse heat exchange problems are considered. Much attention is paid to the most important applied problems of identifying coefficients and boundary conditions for a heat transfer equation. This first volume considers the mathematical models of heat transfer, classic analytical solution methods for heat conduction problems, numerical methods for steady-state and transient heat conduction problems, and phase change problems. The second volume presents solution techniques for complicated heat transfer problems (radiation, convection, thermoelasticity, thermal process control and inverse problems) as well as some examples of solving particular heat transfer problems.

Benchmark Problems for Heat Transfer Codes

A comprehensive reference for engineers and researchers, Gas Turbine Heat Transfer and Cooling Technology, Second Edition has been completely revised and updated to reflect advances in the field made during the past ten years. The second edition retains the format that made the first edition so popular and adds new information mainly based on selec

Heat Transfer

This new text integrates fundamental theory with modern computational tools such

as EES, MATLAB®, and FEHT to equip students with the essential tools for designing and optimizing real-world systems and the skills needed to become effective practicing engineers. Real engineering problems are illustrated and solved in a clear step-by-step manner. Starting from first principles, derivations are tailored to be accessible to undergraduates by separating the formulation and analysis from the solution and exploration steps to encourage a deep and practical understanding. Numerous exercises are provided for homework and self-study and include standard hand calculations as well as more advanced project-focused problems for the practice and application of computational tools. Appendices include reference tables for thermophysical properties and answers to selected homework problems from the book. Complete with an online package of guidance documents on EES, MATLAB®, and FEHT software, sample code, lecture slides, video tutorials, and a test bank and full solutions manual for instructors, this is an ideal text for undergraduate heat transfer courses and a useful guide for practicing engineers.

First U.K. National Conference on Heat Transfer

Harness State-of-the-Art Computational Modeling Tools Computational Modeling of Pulverized Coal Fired Boilers successfully establishes the use of computational modeling as an effective means to simulate and enhance boiler performance. This text factors in how computational flow models can provide a framework for

developing a greater understanding of the underlying processes in PC boilers. It also provides a detailed account of the methodology of computational modeling of pulverized coal boilers, as well as an apt approach to modeling complex processes occurring in PC boilers in a manageable way. Connects Modeling with Real-Life Applications Restricted to the combustion side of the boiler (the authors assume some prior background of reaction engineering and numerical techniques), the book describes the individual aspects of combustion and heat recovery sections of PC boilers that can be used to further improve the design methodologies, optimize boiler performance, and solve practical boiler-related problems. The book provides guidelines on implementing the material in commercial CFD solvers, summarizes key points, and presents relevant case studies. It can also be used to model larger boilers based on conventional, super-critical, or ultra-super critical technologies as well as based on oxy-fuel technologies. Consisting of six chapters, this functional text: Provides a general introduction Explains the overall approach and methodology Explores kinetics of coal pyrolysis (devolatilization) and combustion and methods of its evaluation Presents computational flow modeling approach to simulate pulverized coal fired boiler Covers modeling aspects from formulation of model equations to simulation methodology Determines typical results obtained with computational flow models Discusses the phenomenological models or reactor network models Includes practical applications of computational modeling Computational Modeling of Pulverized Coal Fired Boilers explores the potential of computational models for better engineering of pulverized coal boilers, providing

an ideal resource for practicing engineers working in utility industries. It also benefits boiler design companies, industrial consultants, R & D laboratories, and engineering scientists/research students.

Computational Fluid Dynamics for Engineers

Computational fluid dynamics, CFD, has become an indispensable tool for many engineers. This book gives an introduction to CFD simulations of turbulence, mixing, reaction, combustion and multiphase flows. The emphasis on understanding the physics of these flows helps the engineer to select appropriate models to obtain reliable simulations. Besides presenting the equations involved, the basics and limitations of the models are explained and discussed. The book combined with tutorials, project and power-point lecture notes (all available for download) forms a complete course. The reader is given hands-on experience of drawing, meshing and simulation. The tutorials cover flow and reactions inside a porous catalyst, combustion in turbulent non-premixed flow, and multiphase simulation of evaporation spray respectively. The project deals with design of an industrial-scale selective catalytic reduction process and allows the reader to explore various design improvements and apply best practice guidelines in the CFD simulations.

Computational Heat Transfer

As Computational Fluid Dynamics (CFD) and Computational Heat Transfer (CHT) evolve and become increasingly important in standard engineering design and analysis practice, users require a solid understanding of mechanics and numerical methods to make optimal use of available software. The Finite Element Method in Heat Transfer and Fluid Dynamics, Third Edition illustrates what a user must know to ensure the optimal application of computational procedures—particularly the Finite Element Method (FEM)—to important problems associated with heat conduction, incompressible viscous flows, and convection heat transfer. This book follows the tradition of the bestselling previous editions, noted for their concise explanation and powerful presentation of useful methodology tailored for use in simulating CFD and CHT. The authors update research developments while retaining the previous editions' key material and popular style in regard to text organization, equation numbering, references, and symbols. This updated third edition features new or extended coverage of: Coupled problems and parallel processing Mathematical preliminaries and low-speed compressible flows Mode superposition methods and a more detailed account of radiation solution methods Variational multi-scale methods (VMM) and least-squares finite element models (LSFEM) Application of the finite element method to non-isothermal flows Formulation of low-speed, compressible flows With its presentation of realistic, applied examples of FEM in thermal and fluid design analysis, this proven

masterwork is an invaluable tool for mastering basic methodology, competently using existing simulation software, and developing simpler special-purpose computer codes. It remains one of the very best resources for understanding numerical methods used in the study of fluid mechanics and heat transfer phenomena.

Introduction to Computational Mass Transfer

With complete coverage of the basic principles of heat transfer and a broad range of applications in a flexible format, "Heat and Mass Transfer: A Practical Approach" provides the perfect blend of fundamentals and applications. The text provides a highly intuitive and practical understanding of the material by emphasizing the physics and the underlying physical phenomena involved. Key: Text covers the standard topics of heat transfer with an emphasis on physics and real-world every day applications, while de-emphasizing the intimidating heavy mathematical aspects. This approach is designed to take advantage of students' intuition, making the learning process easier and more engaging. Key: The new edition will add helpful web-links for students. Key: 50% of the Homework Problems including design, computer, essay, lab-type, and FE problems are new or revised to this edition. Using a reader-friendly approach and a conversational writing style, the book is self-instructive and entertains while it teaches. It shows that highly technical matter can be communicated effectively in a simple yet precise

language.

Heat and Mass Transfer

Heat transfer and fluid flow issues are of great significance and this state-of-the-art edited book with reference to new and innovative numerical methods will make a contribution for researchers in academia and research organizations, as well as industrial scientists and college students. The book provides comprehensive chapters on research and developments in emerging topics in computational methods, e.g., the finite volume method, finite element method as well as turbulent flow computational methods. Fundamentals of the numerical methods, comparison of various higher-order schemes for convection-diffusion terms, turbulence modeling, the pressure-velocity coupling, mesh generation and the handling of arbitrary geometries are presented. Results from engineering applications are provided. Chapters have been co-authored by eminent researchers.

Turbomachinery Fluid Dynamics and Heat Transfer

Computational Methods for Heat and Mass Transfer

Computational Aspects of Heat Transfer Benchmark Problems

Computational Fluid Dynamics, Second Edition, provides an introduction to CFD fundamentals that focuses on the use of commercial CFD software to solve engineering problems. This new edition provides expanded coverage of CFD techniques including discretisation via finite element and spectral element as well as finite difference and finite volume methods and multigrid method. There is additional coverage of high-pressure fluid dynamics and meshless approach to provide a broader overview of the application areas where CFD can be used. The book combines an appropriate level of mathematical background, worked examples, computer screen shots, and step-by-step processes, walking students through modeling and computing as well as interpretation of CFD results. It is ideal for senior level undergraduate and graduate students of mechanical, aerospace, civil, chemical, environmental and marine engineering. It can also help beginner users of commercial CFD software tools (including CFX and FLUENT). A more comprehensive coverage of CFD techniques including discretisation via finite element and spectral element as well as finite difference and finite volume methods and multigrid method Coverage of different approaches to CFD grid generation in order to closely match how CFD meshing is being used in industry Additional coverage of high-pressure fluid dynamics and meshless approach to provide a broader overview of the application areas where CFD can be used 20%

new content

Naval Engineers Journal

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

Discontinuous Finite Elements in Fluid Dynamics and Heat Transfer

Over the past several years, significant advances have been made in developing the discontinuous Galerkin finite element method for applications in fluid flow and heat transfer. Certain unique features of the method have made it attractive as an alternative for other popular methods such as finite volume and finite elements in thermal fluids engineering analyses. This book is written as an introductory textbook on the discontinuous finite element method for senior undergraduate and graduate students in the area of thermal science and fluid dynamics. It also can be used as a reference book for researchers and engineers who intend to use the method for research in computational fluid dynamics and heat transfer. A good portion of this book has been used in a course for computational fluid dynamics and heat transfer for senior undergraduate and first year graduate students. It also has been used by some graduate students for self-study of the basics of discontinuous finite elements. This monograph assumes that readers have a basic understanding of thermodynamics, fluid mechanics and heat transfer and some background in numerical analysis. Knowledge of continuous finite elements is not necessary but will be helpful. The book covers the application of the method for the simulation of both macroscopic and micro/nanoscale fluid flow and heat transfer phenomena.

Fundamentals of the Finite Element Method for Heat and Mass Transfer

The special issue on ⬚Computational Analysis of Heat Transfer in Fluids and Solids⬚ of the journal ⬚Defect and Diffusion Forum⬚ addresses various novel nonlinear models and computational techniques important for tackling the heat transfer phenomenon in fluids and solids. Numerical results are discussed quantitatively to illustrate the salient features of practical engineering and industrial applications. Topics covered by excellent research papers in this issue include: extended surfaces fins, reactive flow problem, Newtonian and non-Newtonian flow, nanofluids dynamics, boundary layer flow, natural convection, hydrodynamic stability, biomechanics, plasma physics, physics of dusty plasma, forced convection, mixed convection, magnetohydrodynamics, thermal radiation, porous media flow and irreversibility analysis. We anticipate that our special issue will stimulate and help a wide audience of researchers, engineers and educators from various fields of human activity.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION