As recognized, adventure as competently as experience nearly lesson, amusement, as skillfully as union can be gotten by just checking out a ebook analytical methods in conduction heat transfer with it is not directly done, you could take even more around this life, in relation to the world.

We give you this proper as with ease as easy pretentiousness to acquire those all. We have enough money analytical methods in conduction heat transfer and numerous ebook collections from fictions to scientific research in any way. among them is this analytical methods in conduction heat transfer that can be your partner.

**Analytical Methods in Conduction Heat Transfer**-Glen E. Myers 1998 This book is designed for a one-semester graduate course in conduction heat transfer. The three major chapters are: 3 (separation of variables), 8 (finite differences) and 9 (finite elements). Other topics include Bessel functions, Laplace transforms, complex combination, normalization, superposition and Duhamel's theorem.

**Analytical Methods for Heat Transfer and Fluid Flow Problems**-Bernhard Weigand
This book describes useful analytical methods by applying them to real-world problems rather than solving the usual oversimplified classroom problems. The book demonstrates the applicability of analytical methods even for complex problems and guides the reader to a more intuitive understanding of approaches and solutions. Although the solution of Partial Differential Equations by numerical methods is the standard practice in industries, analytical methods are still important for the critical assessment of results derived from advanced computer simulations and the improvement of the underlying numerical techniques. Literature devoted to analytical methods, however, often focuses on theoretical and mathematical aspects and is therefore useless to most engineers. Analytical Methods for Heat Transfer and Fluid Flow Problems addresses engineers and engineering students. The second edition has been updated, the chapters on non-linear problems and on axial heat conduction problems were extended. And worked out examples were included.

Analytical Heat Transfer
Je-Chin Han

Filling the gap between basic undergraduate courses and advanced graduate courses, this text explains how to analyze and solve conduction, convection, and radiation heat transfer problems analytically. It describes many well-known analytical methods and their solutions, such as Bessel functions, separation of variables, similarity method, integral method, and matrix inversion method. Developed from the author's 30 years of teaching, the text also presents step-by-step mathematical formula derivations, analytical solution procedures, and numerous demonstration examples of heat transfer applications.

Heat Conduction
Liqiu Wang

Many phenomena in social, natural and engineering fields are governed by wave, potential, parabolic heat-conduction, hyperbolic heat-conduction and dual-phase-lagging heat-conduction equations.
This monograph examines these equations: their solution structures, methods of finding their solutions under various supplementary conditions, as well as the physical implication and applications of their solutions.

Analytical Methods in Conduction Heat Transfer - Glen E. Myers 1971

Solving Direct and Inverse Heat Conduction Problems - Jan Taler 2010-04-16 This book presents a solution for direct and inverse heat conduction problems, discussing the theoretical basis for the heat transfer process and presenting selected theoretical and numerical problems in the form of exercises with solutions. The book covers one-, two- and three dimensional problems which are solved by using exact and approximate analytical methods and numerical methods. An accompanying CD-Rom includes computational solutions of the examples and extensive FORTRAN code.

Nonlinear Systems in Heat Transfer - Davood Domairry Ganji 2017-09-15 Nonlinear Heat Transfer: Mathematical Modeling and Analytical Methods addresses recent progress and original research in nonlinear science and its application in the area of heat transfer, with a particular focus on the most important advances and challenging applications. The importance of understanding analytical methods for solving linear and nonlinear constitutive equations is essential in studying engineering problems. This book provides a comprehensive range of (partial) differential equations, applied in the field of heat transfer, tackling a comprehensive range of nonlinear mathematical problems in heat radiation, heat conduction, heat convection, heat diffusion and non-Newtonian fluid systems. Providing various innovative analytical techniques and their practical application in nonlinear engineering problems is the unique point of this book. Drawing a balance between theory and practice, the different chapters of the
book focus not only on the broader linear and nonlinear problems, but also applied examples of practical solutions by the outlined methodologies. Demonstrates applied mathematical techniques in the engineering applications, especially in nonlinear phenomena. Exhibits a complete understanding of analytical methods and nonlinear differential equations in heat transfer. Provides the tools to model and interpret applicable methods in heat transfer processes or systems to solve related complexities.

**Heat Transfer in Structures** - H. Schuh
2014-05-16 Heat Transfer in Structures discusses the heat flow problems directly related to structures. A large section of the book presents the heat conduction in solids. The fundamentals of the analytical method are covered briefly, while introduction on the use of semi-analytical methods is treated in detail. Various approximate methods and finite difference methods are fully explained. The description of structural elements is dealt with extensively. The subject of analogues for finding temperature distributions are briefly discussed, while similarity laws and model testing are covered more comprehensively. Another topic of interest is the heat flow inside the solid part of an ablating body which is covered in detail. Thermal conductance across interfaces and joints are analyzed. And a thorough discussion of the steady heat flow is provided. A section of the text covers the simple structural elements. The book will provide useful information to aeronautics, astronautics, mechanics, engineers, and students of the physical sciences.

**Convection and Conduction Heat Transfer** - Amimul Ahsan 2011-10-21 The convection and conduction heat transfer, thermal conductivity, and phase transformations are significant issues in a design of wide range of industrial processes and devices. This book includes 18 advanced and revised contributions, and it covers mainly (1) heat convection, (2) heat conduction, and (3)
heat transfer analysis. The first section introduces mixed convection studies on inclined channels, double diffusive coupling, and on lid driven trapezoidal cavity, forced natural convection through a roof, convection on non-isothermal jet oscillations, unsteady pulsed flow, and hydromagnetic flow with thermal radiation. The second section covers heat conduction in capillary porous bodies and in structures made of functionally graded materials, integral transforms for heat conduction problems, non-linear radiative-conductive heat transfer, thermal conductivity of gas diffusion layers and multi-component natural systems, thermal behavior of the ink, primer and paint, heating in biothermal systems, and RBF finite difference approach in heat conduction. The third section includes heat transfer analysis of reinforced concrete beam, modeling of heat transfer and phase transformations, boundary conditions-surface heat flux and temperature, simulation of phase change materials, and finite element methods of factorial design. The advanced idea and information described here will be fruitful for the readers to find a sustainable solution in an industrialized society.

**The Finite Element Method in Heat Transfer Analysis**-Roland W. Lewis 1996-08-06 Heat transfer analysis is a problem of major significance in a vast range of industrial applications. These extend over the fields of mechanical engineering, aeronautical engineering, chemical engineering and numerous applications in civil and electrical engineering. If one considers the heat conduction equation alone the number of practical problems amenable to solution is extensive. Expansion of the work to include features such as phase change, coupled heat and mass transfer, and thermal stress analysis provides the engineer with the capability to address a further series of key engineering problems. The complexity of practical problems is such that closed form solutions are not generally possible. The use of numerical techniques to solve such problems is therefore considered essential, and this book presents the
use of the powerful finite element method in heat transfer analysis. Starting with the fundamental general heat conduction equation, the book moves on to consider the solution of linear steady state heat conduction problems, transient analyses and non-linear examples. Problems of melting and solidification are then considered at length followed by a chapter on convection. The application of heat and mass transfer to drying problems and the calculation of both thermal and shrinkage stresses conclude the book. Numerical examples are used to illustrate the basic concepts introduced. This book is the outcome of the teaching and research experience of the authors over a period of more than 20 years.

**Thermal Radiative Transfer and Properties**-M. Quinn Brewster 1992-04-16 Not only enables readers to include radiation as part of their design and analysis but also appreciate the radiative transfer processes in both nature and engineering systems. Offers two distinguishing features--a whole chapter devoted to the classical dispersion theory which lays a foundation for the discussion of radiative properties presented throughout and a detailed description of particle radiative properties, including real particle size distribution effects. Presents numerous realistic and instructive illustrations and problems involving current topics such as planetary heat transfer, satellite thermal control, atmospheric radiation, radiation in industrial and propulsion combustion systems and more.

**Analytical Heat Diffusion Theory**-Alekseĭ Vasil’evich Lykov 1968 Analytical Heat Diffusion Theory ...

**Heat Conduction**-David W. Hahn 2012-08-20 The long-awaited revision of the bestseller on heat conduction Heat Conduction, Third Edition is an update of the classic text on heat conduction, replacing some of the coverage of numerical methods with content on micro- and nanoscale heat transfer. With an emphasis on the
mathematics and underlying physics, this new edition has considerable depth and analytical rigor, providing a systematic framework for each solution scheme with attention to boundary conditions and energy conservation. Chapter coverage includes: Heat conduction fundamentals Orthogonal functions, boundary value problems, and the Fourier Series The separation of variables in the rectangular coordinate system The separation of variables in the cylindrical coordinate system The separation of variables in the spherical coordinate system Solution of the heat equation for semi-infinite and infinite domains The use of Duhamel's theorem The use of Green's function for solution of heat conduction The use of the Laplace transform One-dimensional composite medium Moving heat source problems Phase-change problems Approximate analytic methods Integral-transform technique Heat conduction in anisotropic solids Introduction to microscale heat conduction In addition, new capstone examples are included in this edition and extensive problems, cases, and examples have been thoroughly updated. A solutions manual is also available. Heat Conduction is appropriate reading for students in mainstream courses of conduction heat transfer, students in mechanical engineering, and engineers in research and design functions throughout industry.

Conduction Heat Transfer Analysis in Composite Materials-Lit S. Han 1980

Heat Transfer with Freezing and Thawing-V.J. Lunardini 1991-01-15 This volume provides a comprehensive overview on the vast amount of literature on solidification heat transfer. Chapter one develops important basic equations and discusses the validity of considering only conductive heat transfer, while ignoring convection, in the large class of materials which make up the porous media. Chapters 2 to 4 deal with problems that can be expressed in plane (Cartesian) coordinates. These problems are further divided into boundary conditions of
temperature, prescribed heat flux, and surface convection. Chapter 5 examines some plane geometries involving three-dimensional freezing or thawing. Problems in the cylindrical and spherical coordinate systems are covered in chapters 6 and 7. Chapter 8 is an introduction to solidification in porous media. Many of the applications have been directed to water/ice soil-systems, but it should be clear that the basic techniques and solutions can be applied to such diverse areas as metallurgy, biological systems, latent heat storage, and the preservation of food.

Analytical Solutions of Heat Conduction Problems- The following thesis deals with the analytical methods which are in vogue for solving problems to the area of heat conduction. There have been discussed two methods, an old method known as the HEAT BALANCE INTEGRAL METHOD, and a relatively newer method christened as the DIFFERENTIAL TRANSFORMATION METHOD. The latter is dealt with first, as it is easier of the two. Dealing involves the basic idea of the method used, followed by the general theorems adopted. Two problems follow, illustrating the ease of use of this method, along with a comparison with the solutions of the problem using the numerical methods. The former method, on the other hand, is more of an assumptive method, where one has to guess a temperature profile for proceeding. This is, nonetheless, a very accurate method, albeit a long one. Similar comparisons have been made for this method, like the ones made for the DT method. The reader may use either method with ease, as it was for the simplification of the problem that these methods were developed.

Inverse Heat Conduction-James V. Beck 1985-10-02 Here is the only commercially published work to deal with the engineering problem of determining surface heat flux and temperature history based on interior temperature measurements. Provides the analytical techniques needed to arrive at otherwise difficult solutions, summarizing the
findings of the last ten years. Topics include the steady state solution, Duhamel's Theorem, ill-posed problems, single future time step, and more.

Heat Conduction Using Greens Functions
Kevin Cole 2010-07-16 Since its publication more than 15 years ago, Heat Conduction Using Green's Functions has become the consummate heat conduction treatise from the perspective of Green's functions-and the newly revised Second Edition is poised to take its place. Based on the authors' own research and classroom experience with the material, this book organizes the so

detail, but also trains them to use the techniques only when simpler approaches fail. Covering all essential methods offered in traditional texts, but with a different order, Professor Sidebotham stresses inductive thinking and problem solving as well as a constructive understanding of modern, computer-based practice. Readers learn to develop their own code in the context of the material, rather than just how to use packaged software, offering a deeper, intrinsic grasp behind models of heat transfer. Developed from over twenty-five years of lecture notes to teach students of mechanical and chemical engineering at The Cooper Union for the Advancement of Science and Art, the book is ideal for students and practitioners across engineering disciplines seeking a solid understanding of heat transfer. This book also: · Adopts a novel inductive pedagogy where commonly understood examples are introduced early and theory is developed to explain and predict readily recognized phenomena · Introduces new techniques as needed to address specific problems, in contrast to traditional texts’ use of a deductive approach,
Conduction Heat Transfer - Dimos Poulikakos 1994

This introduction to conduction heat transfer blends a description of the necessary mathematics with contemporary engineering applications. Examples include: heat transfer in manufacturing processes, the cooling of electronic equipment and heat transfer in various applications.

Inverse Heat Conduction and Heat Exchangers - Suvanjan Bhattacharyya 2020-12-02

A direct solution of the heat conduction equation with prescribed initial and boundary conditions yields temperature distribution inside a specimen. The direct solution is mathematically considered as a well-posed one because the solution exists, is unique, and continuously depends on input data. The estimation of unknown parameters from the measured temperature data is known as the inverse problem of heat conduction. An error in temperature measurement, thermal time lagging, thermocouple-cavity, or signal noise data makes stability a problem in the estimation of unknown parameters. The solution of the inverse problem can be obtained by employing the gradient or non-gradient based inverse algorithm. The aim of this book is to analyze the inverse problem and heat exchanger applications in the fields of...
aerospace, mechanical, applied mechanics, environment sciences, and engineering.

**Numerical and Analytical Methods with MATLAB**-William Bober 2009-08-11 Numerical and Analytical Methods with MATLAB® presents extensive coverage of the MATLAB programming language for engineers. It demonstrates how the built-in functions of MATLAB can be used to solve systems of linear equations, ODEs, roots of transcendental equations, statistical problems, optimization problems, control systems problems, and stress analysis problems. These built-in functions are essentially black boxes to students. By combining MATLAB with basic numerical and analytical techniques, the mystery of what these black boxes might contain is somewhat alleviated. This classroom-tested text first reviews the essentials involved in writing computer programs as well as fundamental aspects of MATLAB. It next explains how matrices can solve problems of linear equations, how to obtain the roots of algebraic and transcendental equations, how to evaluate integrals, and how to solve various ODEs. After exploring the features of Simulink, the book discusses curve fitting, optimization problems, and PDE problems, such as the vibrating string, unsteady heat conduction, and sound waves. The focus then shifts to the solution of engineering problems via iteration procedures, differential equations via Laplace transforms, and stress analysis problems via the finite element method. The final chapter examines control systems theory, including the design of single-input single-output (SISO) systems. Two Courses in One Textbook The first six chapters are appropriate for a lower level course at the sophomore level. The remaining chapters are ideal for a course at the senior undergraduate or first-year graduate level. Most of the chapters contain projects that require students to write a computer program in MATLAB that produces tables, graphs, or both. Many sample MATLAB programs (scripts) in the text provide guidance on completing these projects.
Heat Conduction - Yaman Yener 2018-05-04
Nearly thirty years since its first publication, the highly anticipated fourth edition of Heat Conduction upholds its reputation as an instrumental textbook and reference for graduate students and practicing engineers in mechanical engineering and thermal sciences. Written to suit a one-semester graduate course, the text begins with fundamental concepts, introducing the governing equation of heat conduction as derived from the First law of Thermodynamics. Solutions for one-dimensional conduction follow, then orthogonal functions, Fourier series and transforms, and multi-dimensional problems. Later sections focus on a series of specialized techniques, including integral equations, Laplace transforms, finite difference numerical methods, and variational formulations. Two new chapters (9 and 11) have been added to cover heat conduction with local heat sources and heat conduction involving phase change. Applications of Fourier transforms in the semi-infinite and infinite regions have been added to Chapter 7 and Chapter 10 has been expanded to include solutions by the similarity method. Also new to the fourth edition are additional problems at the end of each chapter.

Heat Conduction, Fifth Edition - Sadık Kakac 2018-07-11 Heat Conduction, Fifth Edition, upholds its reputation as the leading text in the field for graduate students, and as a resource for practicing engineers. The text begins with fundamental concepts, introducing the governing equation of heat conduction, and progresses through solutions for one-dimensional conduction, orthogonal functions, Fourier series and transforms, and multi-dimensional problems. Integral equations, Laplace transforms, finite difference numerical methods, and variational formulations are then covered. A systematic derivation of the analytical solution of heat conduction problems in heterogeneous media, introducing a more general approach based on the integral transform method, has been added in this new edition, along with new and revised
problems, and complete problem solutions for instructors.

**Finite Difference Methods in Heat Transfer**
M. Necati Özisik 2017-07-20

Finite Difference Methods in Heat Transfer, Second Edition focuses on finite difference methods and their application to the solution of heat transfer problems. Such methods are based on the discretization of governing equations, initial and boundary conditions, which then replace a continuous partial differential problem by a system of algebraic equations. Finite difference methods are a versatile tool for scientists and for engineers. This updated book serves university students taking graduate-level coursework in heat transfer, as well as being an important reference for researchers and engineering.

**Heat Transfer in Structures**
Herbert Schuh 1965

Heat Transfer in Structures discusses the heat flow problems directly related to structures. A large section of the book presents the heat conduction in solids. The fundamentals of the analytical method are covered briefly, while introduction on the use of semi-analytical methods is treated in detail. Various approximate methods and finite difference methods are fully explained.

**Inverse Heat Transfer**
M. Necat Ozisik 2018-05-02

This book introduces the fundamental concepts of inverse heat transfer problems. It presents in detail the basic steps of four techniques of inverse heat transfer protocol, as a parameter estimation approach and as a function estimation approach. These techniques

---

*analytical-methods-in-conduction-heat-transfer*
are then applied to the solution of the problems of practical engineering interest involving conduction, convection, and radiation. The text also introduces a formulation based on generalized coordinates for the solution of inverse heat conduction problems in two-dimensional regions.

Combustion technology has traditionally been dominated by air/fuel combustion. However, two developments have increased the significance of oxygen-enhanced combustion—new technologies that produce oxygen less expensively and the increased importance of environmental regulations. Advantages of oxygen-enhanced combustion include less pollutant emissions as well as increased energy efficiency and productivity. Oxygen-Enhanced Combustion, Second Edition compiles information about using oxygen to enhance industrial heating and melting processes. It integrates fundamental principles, applications, and equipment design in one volume, making it a unique resource for specialists implementing the use of oxygen in combustion systems. This second edition of the bestselling book has more than doubled in size. Extensively updated and expanded, it covers significant advances in the technology that have occurred since the publication of the first edition. What’s New in This Edition
Expanded from 11 chapters to 30, with most of the existing chapters revised
A broader view of oxygen-enhanced combustion, with more than 50 contributors from over 20 organizations around the world
More coverage of fundamentals, including fluid flow, heat transfer, noise, flame impingement, CFD modeling, soot formation, burner design, and burner testing
New chapters on applications such as flameless combustion, steel reheating, iron production, cement production, power generation, fluidized bed combustion, chemicals and petrochemicals, and diesel engines
This book offers a unified, up-to-date look at important commercialized uses of oxygen-enhanced combustion in a wide range of industries. It
brings together the latest knowledge to assist those researching, engineering, and implementing combustion in power plants, engines, and other applications.

**Heat Transfer in Food Processing** - S. Yanniotis 2007 Heat Transfer is important in food processing. This edited book presents a review of ongoing activities in a broad perspective.

**A HEAT TRANSFER TEXTBOOK** - John H. Lienhard 2004

**Insulation Materials in Context of Sustainability** - Amjad Almusaed 2016-08-31 This book gives information and guidance on important subjects. It presents the major and efficient applications for efficient insulation materials. The book is divided into two parts. Part I discusses ecological insulation materials. In this part, the three sub-subjects are drafting, Unconventional insulation materials, Jute-Based Insulation Material, and Possible Applications of Corn Cob as a Raw Insulation Material. Part II: discusses Practical Applying and Performance of Insulation Materials (case studies), where three sub-subjects are drafting seismic aspects of the application of thermal insulation boards beneath the building's foundations, flammability of bio-based rigid polyurethane foam thermal insulation, and the review of some commonly used methods and techniques to measure the thermal conductivity of insulation materials.

**Heat Transfer in Single and Multiphase Systems** - Greg F. Naterer 2002-08-29 Extensively revised and thoroughly updated, this popular text de-emphasizes high level mathematics in favor of effective, accurate modeling. Real-world examples amplify the theory and show how to use derived equations to model physical problems. Exercises that parallel the examples build readers' confidence and prepare them to confront the more complex situations they
encounter as professionals.

**Finite Element Simulation of Heat Transfer**
Jean-Michel Bergheau 2013-03-01 This book introduces the finite element method applied to the resolution of industrial heat transfer problems. Starting from steady conduction, the method is gradually extended to transient regimes, to traditional non-linearities, and to convective phenomena. Coupled problems involving heat transfer are then presented. Three types of couplings are discussed: coupling through boundary conditions (such as radiative heat transfer in cavities), addition of state variables (such as metallurgical phase change), and coupling through partial differential equations (such as electrical phenomena). A review of the various thermal phenomena is drawn up, which an engineer can simulate. The methods presented will enable the reader to achieve optimal use from finite element software and also to develop new applications.

**Analytical Heat Diffusion Theory**
A Luikov 2012-12-02 Analytical Heat Diffusion Theory is a revised edition of an earlier book by Academician Luikov, which was widely used throughout the Soviet Union and the surrounding socialist countries. This book is divided into 15 chapters that treat heat conduction problems by the classical methods and emphasize the advantages of the transform method, particularly in obtaining short time solutions of many transient problems. This book starts with a discussion on the physical fundamentals, generalized variables, and solution of boundary value problems of heat transfer. Considerable chapters are devoted to the basic classical heat transfer problems and problems in which the body surface temperature is a specified function of time. Other chapters explore the heat transfer problems under different heat sources, including continuous and pulse-type. The discussion then shifts to the problem of freezing wet ground, two-dimensional temperature field, and heat conduction with variable transfer coefficients. The final chapters
deal with the fundamentals of the integral transforms and their application to heat conduction problems. These chapters also look into the application of the theory of analytic functions to the heat conduction theory of mathematical physics. This book is an invaluable source for advanced undergraduate or graduate in analytical heat transfer.

**Convection and Conduction Heat Transfer**
Amimul Ahsan 2011-10-21 The convection and conduction heat transfer, thermal conductivity, and phase transformations are significant issues in a design of wide range of industrial processes and devices. This book includes 18 advanced and revised contributions, and it covers mainly (1) heat convection, (2) heat conduction, and (3) heat transfer analysis. The first section introduces mixed convection studies on inclined channels, double diffusive coupling, and on lid driven trapezoidal cavity, forced natural convection through a roof, convection on non-isothermal jet oscillations, unsteady pulsed flow, and hydromagnetic flow with thermal radiation. The second section covers heat conduction in capillary porous bodies and in structures made of functionally graded materials, integral transforms for heat conduction problems, non-linear radiative-conductive heat transfer, thermal conductivity of gas diffusion layers and multi-component natural systems, thermal behavior of the ink, primer and paint, heating in biothermal systems, and RBF finite difference approach in heat conduction. The third section includes heat transfer analysis of reinforced concrete beam, modeling of heat transfer and phase transformations, boundary conditions-surface heat flux and temperature, simulation of phase change materials, and finite element methods of factorial design. The advanced idea and information described here will be fruitful for the readers to find a sustainable solution in an industrialized society.

**Heating and Cooling of Buildings**
T. Agami Reddy 2016-09-01 Heating and Cooling of
Buildings: Principles and Practice of Energy Efficient Design, Third Edition is structured to provide a rigorous and comprehensive technical foundation and coverage to all the various elements inherent in the design of energy efficient and green buildings. Along with numerous new and revised examples, design case studies, and homework problems, the third edition includes the HCB software along with its extensive website material, which contains a wealth of data to support design analysis and planning. Based around current codes and standards, the Third Edition explores the latest technologies that are central to design and operation of today’s buildings. It serves as an up-to-date technical resource for future designers, practitioners, and researchers wishing to acquire a firm scientific foundation for improving the design and performance of buildings and the comfort of their occupants. For engineering and architecture students in undergraduate/graduate classes, this comprehensive textbook:

**Thermal Conductivity 24/Thermal Expansion 12**-Peter S. Gaal 1999-01-11

**Food Engineering Handbook**-Theodoros Varzakas 2014-12-02 Food Engineering Handbook: Food Engineering Fundamentals provides a stimulating and up-to-date review of food engineering phenomena. Combining theory with a practical, hands-on approach, this book covers the key aspects of food engineering, from mass and heat transfer to steam and boilers, heat exchangers, diffusion, and absorption. A complement to

**Homotopy Analysis Method in Nonlinear Differential Equations**-Shijun Liao 2012-06-22 "Homotopy Analysis Method in Nonlinear Differential Equations" presents the latest developments and applications of the analytic approximation method for highly nonlinear problems, namely the homotopy analysis method (HAM). Unlike perturbation methods, the HAM
has nothing to do with small/large physical parameters. In addition, it provides great freedom to choose the equation-type of linear sub-problems and the base functions of a solution. Above all, it provides a convenient way to guarantee the convergence of a solution. This book consists of three parts. Part I provides its basic ideas and theoretical development. Part II presents the HAM-based Mathematica package BVPh 1.0 for nonlinear boundary-value problems and its applications. Part III shows the validity of the HAM for nonlinear PDEs, such as the American put option and resonance criterion of nonlinear travelling waves. New solutions to a number of nonlinear problems are presented, illustrating the originality of the HAM. Mathematica codes are freely available online to make it easy for readers to understand and use the HAM. This book is suitable for researchers and postgraduates in applied mathematics, physics, nonlinear mechanics, finance and engineering. Dr. Shijun Liao, a distinguished professor of Shanghai Jiao Tong University, is a pioneer of the HAM.

Heat Conduction, Fifth Edition-Sadık Kakac 2018-07-11 Heat Conduction, Fifth Edition, upholds its reputation as the leading text in the field for graduate students, and as a resource for practicing engineers. The text begins with fundamental concepts, introducing the governing equation of heat conduction, and progresses through solutions for one-dimensional conduction, orthogonal functions, Fourier series and transforms, and multi-dimensional problems. Integral equations, Laplace transforms, finite difference numerical methods, and variational formulations are then covered. A systematic derivation of the analytical solution of heat conduction problems in heterogeneous media, introducing a more general approach based on the integral transform method, has been added in this new edition, along with new and revised problems, and complete problem solutions for instructors.