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Engineering Mathematics with Examples and

Applications - Xin-She Yang
2016-12-29

Engineering Mathematics with Examples and Applications provides a compact and concise primer in the field, starting with the foundations, and then gradually developing to the advanced level of mathematics that is necessary for all engineering disciplines. Therefore, this book's aim is to

help undergraduates rapidly develop the fundamental knowledge of engineering mathematics. The book can also be used by graduates to review and refresh their mathematical skills. Step-by-step worked examples will help the students gain more insights and build sufficient confidence in engineering mathematics and problem-solving. The main approach and style of this book is informal, theorem-free, and

practical. By using an informal and theorem-free approach, all fundamental mathematics topics required for engineering are covered, and readers can gain such basic knowledge of all important topics without worrying about rigorous (often boring) proofs. Certain rigorous proof and derivatives are presented in an informal way by direct, straightforward mathematical operations and calculations, giving students the same level of fundamental knowledge without any tedious steps. In addition, this practical approach provides over 100 worked examples so that students can see how each step of mathematical problems can be derived without any gap or jump in steps. Thus, readers can build their understanding and mathematical confidence gradually and in a step-by-step manner. Covers fundamental engineering topics that are presented at the right level, without worry of rigorous proofs Includes step-by-step worked examples (of which 100+ feature in the work) Provides an emphasis on

numerical methods, such as root-finding algorithms, numerical integration, and numerical methods of differential equations Balances theory and practice to aid in practical problem-solving in various contexts and applications

Mechanics - DS Mathur
2000-10

The book presents a comprehensive study of important topics in Mechanics of pure and applied sciences. It provides knowledge of scalar and vector in optimum depth to make the students understand the concepts of Mechanics in simple, coherent and lucid manner and grasp its principles & theory. It caters to the requirements of students of B.Sc. Pass and Honours courses. Students of engineering disciplines and the ones aspiring for competitive exams such as AIME and others, will also find it useful for their preparations.

Differential Equations - Paul Blanchard
2012-07-25

Incorporating an innovative modeling approach, this book

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for a one-semester differential equations course emphasizes conceptual understanding to help users relate information taught in the classroom to real-world experiences. Certain models reappear throughout the book as running themes to synthesize different concepts from multiple angles, and a dynamical systems focus emphasizes predicting the long-term behavior of these recurring models. Users will discover how to identify and harness the mathematics they will use in their careers, and apply it effectively outside the classroom. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Beginning Partial Differential Equations -

Peter V. O'Neil 2014-05-07
A broad introduction to PDEs with an emphasis on specialized topics and applications occurring in a variety of fields Featuring a thoroughly revised presentation of topics, Beginning Partial

Differential Equations, Third Edition provides a challenging, yet accessible, combination of techniques, applications, and introductory theory on the subject of partial differential equations. The new edition offers nonstandard coverage on material including Burger's equation, the telegraph equation, damped wave motion, and the use of characteristics to solve nonhomogeneous problems. The Third Edition is organized around four themes: methods of solution for initial-boundary value problems; applications of partial differential equations; existence and properties of solutions; and the use of software to experiment with graphics and carry out computations. With a primary focus on wave and diffusion processes, Beginning Partial Differential Equations, Third Edition also includes: Proofs of theorems incorporated within the topical presentation, such as the existence of a solution for the Dirichlet problem The incorporation of Maple™ to perform computations

and experiments Unusual applications, such as Poë's pendulum Advanced topical coverage of special functions, such as Bessel, Legendre polynomials, and spherical harmonics Fourier and Laplace transform techniques to solve important problems Beginning of Partial Differential Equations, Third Edition is an ideal textbook for upper-undergraduate and first-year graduate-level courses in analysis and applied mathematics, science, and engineering.

Partial Differential Equations with Fourier Series and Boundary Value Problems -

Nakhlé H. Asmar 2005

This example-rich reference fosters a smooth transition from elementary ordinary differential equations to more advanced concepts. Asmar's relaxed style and emphasis on applications make the material accessible even to readers with limited exposure to topics beyond calculus. Encourages computer for illustrating results and applications, but is also suitable for use without

computer access. Contains more engineering and physics applications, and more mathematical proofs and theory of partial differential equations, than the first edition. Offers a large number of exercises per section.

Provides marginal comments and remarks throughout with insightful remarks, keys to following the material, and formulas recalled for the reader's convenience. Offers Mathematica files available for download from the author's website. A useful reference for engineers or anyone who needs to brush up on partial differential equations.

Continuum Mechanics - D. S.

Chandrasekharaiah 2014-05-19

A detailed and self-contained text written for beginners, Continuum Mechanics offers concise coverage of the basic concepts, general principles, and applications of continuum mechanics. Without sacrificing rigor, the clear and simple mathematical derivations are made accessible to a large number of students with little or no previous background in

solid or fluid mechanics. With the inclusion of more than 250 fully worked-out examples and 500 worked exercises, this book is certain to become a standard introductory text for students as well as an indispensable reference for professionals. Key Features *

- Provides a clear and self-contained treatment of vectors, matrices, and tensors specifically tailored to the needs of continuum mechanics
- * Develops the concepts and principles common to all areas in solid and fluid mechanics with a common notation and terminology
- * Covers the fundamentals of elasticity theory and fluid mechanics

Handbook of Linear Partial Differential Equations for Engineers and Scientists - Andrei D. Polyainin 2001-11-28

Following in the footsteps of the authors' bestselling Handbook of Integral Equations and Handbook of Exact Solutions for Ordinary Differential Equations, this handbook presents brief formulations and exact solutions for more than 2,200

equations and problems in science and engineering. Parabolic, hyperbolic, and elliptic equations with

Partial Differential Equations with Fourier Series and Boundary Value Problems - Nakhle H. Asmar 2017-03-23

Rich in proofs, examples, and exercises, this widely adopted text emphasizes physics and engineering applications. The Student Solutions Manual can be downloaded free from Dover's site; the Instructor Solutions Manual is available upon request. 2004 edition, with minor revisions.

Partial Differential Equations: Graduate Level Problems and Solutions - Igor Yanovsky 2014-10-21

Partial Differential Equations: Graduate Level Problems and Solutions By Igor Yanovsky *Mathematical Methods for Engineers and Scientists 3* - Kwong-Tin Tang 2007-01-10

Pedagogical insights gained through 30 years of teaching applied mathematics led the author to write this set of student oriented books. Topics

such as complex analysis, matrix theory, vector and tensor analysis, Fourier analysis, integral transforms, ordinary and partial differential equations are presented in a discursive style that is readable and easy to follow. Numerous examples, completely worked out, together with carefully selected problem sets with answers are used to enhance students' understanding and manipulative skill. The goal is to make students comfortable in using advanced mathematical tools in junior, senior, and beginning graduate courses.

Nonlinear Dispersive Wave Systems - Debnath Lokenath
1992-09-09

The book includes all the subject matter covered in a typical undergraduate course in engineering thermodynamics. It includes a series of worked examples in each chapter, carefully chosen to expose students to diverse applications of engineering thermodynamics. Each worked example is designed to be representative of a class of

physical problems. At the end of each chapter, there are an additional 10 to 15 problems for which numerical answers are provided.

Mathematical Methods for Engineers and Scientists 1 - Kwong-Tin Tang 2006-11-22
The topics of this set of student-oriented books are presented in a discursive style that is readable and easy to follow. Numerous clearly stated, completely worked out examples together with carefully selected problem sets with answers are used to enhance students' understanding and manipulative skill. The goal is to help students feel comfortable and confident in using advanced mathematical tools in junior, senior, and beginning graduate courses.

An Introduction to Continuum Mechanics - Junuthula Narasimha Reddy 2013-07-29
This best-selling textbook presents the concepts of continuum mechanics, and the second edition includes additional explanations, examples and exercises.

Principles of Partial Differential Equations - Alexander Komech
2009-10-05

This concise book covers the classical tools of Partial Differential Equations Theory in today's science and engineering. The rigorous theoretical presentation includes many hints, and the book contains many illustrative applications from physics.

Partial Differential Equations for Scientists and Engineers - Tyn Myint U. 1987

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.

Applied Engineering Mathematics - Xin-She Yang
2007

This book strives to provide a concise and yet comprehensive cover-age of all major mathematical methods in engineering. Topics in-clude advanced calculus, ordinary and partial differential equations, complex variables, vector and tensor analysis, calculus of variations, integral transforms, integral equations, numerical methods, and probability and statistics.

Application topics consist of linear elasticity, harmonic motions, chaos, and reaction-diffusion systems. . This book can serve as a textbook in engineering mathematics, mathematical modelling and scientific computing. This book is organised into 19 chapters.

Chapters 1-14 introduce various mathematical methods, Chapters 15-18 concern the numeri-cal methods, and Chapter 19 introduces the probability and statistics.

Linear Partial Differential Equations for Scientists and Engineers - Tyn Myint-U
2006-12-15

This significantly expanded fourth edition is designed as an introduction to the theory and applications of linear PDEs. The authors provide fundamental concepts, underlying principles, a wide range of applications, and various methods of solutions to PDEs. In addition to essential standard material on the subject, the book contains new material that is not usually covered in similar texts and reference books. It also contains a large number of worked examples and exercises dealing with problems in fluid mechanics, gas dynamics, optics, plasma physics, elasticity, biology, and chemistry; solutions are provided.

Domination in Graphs -

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Teresa W. Haynes 2017-11-22
"Presents the latest in graph domination by leading researchers from around the world-furnishing known results, open research problems, and proof techniques. Maintains standardized terminology and notation throughout for greater accessibility. Covers recent developments in domination in graphs and digraphs, dominating functions, combinatorial problems on chessboards, and more.

Partial Differential Equations - T. Hillen

2019-05-15

Provides more than 150 fully solved problems for linear partial differential equations and boundary value problems. Partial Differential Equations: Theory and Completely Solved Problems offers a modern introduction into the theory and applications of linear partial differential equations (PDEs). It is the material for a typical third year university course in PDEs. The material of this textbook has been extensively class tested over a

period of 20 years in about 60 separate classes. The book is divided into two parts. Part I contains the Theory part and covers topics such as a classification of second order PDEs, physical and biological derivations of the heat, wave and Laplace equations, separation of variables, Fourier series, D'Alembert's principle, Sturm-Liouville theory, special functions, Fourier transforms and the method of characteristics. Part II contains more than 150 fully solved problems, which are ranked according to their difficulty. The last two chapters include sample Midterm and Final exams for this course with full solutions.

A First Course in Functional Analysis - S. David Promislow
2008-04-25

A concise introduction to the major concepts of functional analysis. Requiring only a preliminary knowledge of elementary linear algebra and real analysis, *A First Course in Functional Analysis* provides an introduction to the basic principles and practical

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applications of functional analysis. Key concepts are illustrated in a straightforward manner, which facilitates a complete and fundamental understanding of the topic. This book is based on the author's own class-tested material and uses clear language to explain the major concepts of functional analysis, including Banach spaces, Hilbert spaces, topological vector spaces, as well as bounded linear functionals and operators. As opposed to simply presenting the proofs, the author outlines the logic behind the steps, demonstrates the development of arguments, and discusses how the concepts are connected to one another. Each chapter concludes with exercises ranging in difficulty, giving readers the opportunity to reinforce their comprehension of the discussed methods. An appendix provides a thorough introduction to measure and integration theory, and additional appendices address the background material on topics such as Zorn's lemma,

the Stone-Weierstrass theorem, Tychonoff's theorem on product spaces, and the upper and lower limit points of sequences. References to various applications of functional analysis are also included throughout the book. A First Course in Functional Analysis is an ideal text for upper-undergraduate and graduate-level courses in pure and applied mathematics, statistics, and engineering. It also serves as a valuable reference for practitioners across various disciplines, including the physical sciences, economics, and finance, who would like to expand their knowledge of functional analysis.

[An Introduction to Lagrangian Mechanics](#) - Alain J Brizard
2014-11-28

An Introduction to Lagrangian Mechanics begins with a proper historical perspective on the Lagrangian method by presenting Fermat's Principle of Least Time (as an introduction to the Calculus of Variations) as well as the principles of Maupertuis,

Jacobi, and d'Alembert that preceded Hamilton's formulation of the Principle of Least Action, from which the Euler-Lagrange equations of motion are derived. Other additional topics not traditionally presented in undergraduate textbooks include the treatment of constraint forces in Lagrangian Mechanics; Routh's procedure for Lagrangian systems with symmetries; the art of numerical analysis for physical systems; variational formulations for several continuous Lagrangian systems; an introduction to elliptic functions with applications in Classical Mechanics; and Noncanonical Hamiltonian Mechanics and perturbation theory. The Second Edition includes a larger selection of examples and problems (with hints) in each chapter and continues the strong emphasis of the First Edition on the development and application of mathematical methods (mostly calculus) to the solution of problems in Classical

Mechanics. New material has been added to most chapters. For example, a new derivation of the Noether theorem for discrete Lagrangian systems is given and a modified Rutherford scattering problem is solved exactly to show that the total scattering cross section associated with a confined potential (i.e., which vanishes beyond a certain radius) yields the hard-sphere result. The Frenet-Serret formulas for the Coriolis-corrected projectile motion are presented, where the Frenet-Serret torsion is shown to be directly related to the Coriolis deflection, and a new treatment of the sleeping-top problem is given.

Ordinary Differential Equations
- Tyn Myint U. 1978

Nonlinear Partial Differential Equations for Scientists and Engineers - Lokenath Debnath
2013-11-11

This expanded and revised second edition is a comprehensive and systematic treatment of linear and nonlinear partial differential

equations and their varied applications. Building upon the successful material of the first book, this edition contains updated modern examples and applications from diverse fields. Methods and properties of solutions, along with their physical significance, help make the book more useful for a diverse readership. The book is an exceptionally complete text/reference for graduates, researchers, and professionals in mathematics, physics, and engineering.

Introduction to Partial Differential Equations with Applications - E. C.

Zachmanoglou 2012-04-20

This text explores the essentials of partial differential equations as applied to engineering and the physical sciences. Discusses ordinary differential equations, integral curves and surfaces of vector fields, the Cauchy-Kovalevsky theory, more. Problems and answers.

The Laplace Transform - Joel L. Schiff 2014-01-15

An Introduction to Laplace

Transforms and Fourier Series
- P.P.G. Dyke 2012-12-06

This introduction to Laplace transforms and Fourier series is aimed at second year students in applied mathematics. It is unusual in treating Laplace transforms at a relatively simple level with many examples. Mathematics students do not usually meet this material until later in their degree course but applied mathematicians and engineers need an early introduction.

Suitable as a course text, it will also be of interest to physicists and engineers as supplementary material.

Mathematical Reviews - 1998

Advanced Engineering Mathematics - R. K. Jain
2007-01-01

This work is based on the experience and notes of the authors while teaching mathematics courses to engineering students at the Indian Institute of Technology, New Delhi. It covers syllabi of two core courses in mathematics for engineering students.

Whitaker's Book List - 1987

Integral Transforms and their Applications - B. Davies 2013-11-11

In preparing this second edition I have restricted myself to making small corrections and changes to the first edition. Two chapters have had extensive changes made. First, the material of Sections 14.1 and 14.2 has been rewritten to make explicit reference to the book of Bleistein and Handelsman, which appeared after the original Chapter 14 had been written. Second, Chapter 21, on numerical methods, has been rewritten to take account of comparative work which was done by the author and Brian Martin, and published as a review paper. The material for all of these chapters was in fact, prepared for a translation of the book. Considerable thought has been given to a much more comprehensive revision and expansion of the book. In particular, there have been spectacular advances in the solution of some non-linear

problems using isospectral methods, which may be regarded as a generalization of the Fourier transform. However, the subject is a large one, and even a modest introduction would have added substantially to the book. Moreover, the recent book by Dodd et al. is at a similar level to the present volume. Similarly, I have refrained from expanding the chapter on numerical methods into a complete new part of the book, since a specialized monograph on numerical methods is in preparation in collaboration with a colleague.

Applied Partial Differential Equations - J. David Logan 2012-12-06

This textbook is for the standard, one-semester, junior-senior course that often goes by the title "Elementary Partial Differential Equations" or "Boundary Value Problems." The audience usually consists of students in mathematics, engineering, and the physical sciences. The topics include derivations of some of the standard equations of

mathematical physics (including the heat equation, the wave equation, and the Laplace's equation) and methods for solving those equations on bounded and unbounded domains. Methods include eigenfunction expansions or separation of variables, and methods based on Fourier and Laplace transforms. Prerequisites include calculus and a post-calculus differential equations course. There are several excellent texts for this course, so one can legitimately ask why one would wish to write another. A survey of the content of the existing titles shows that their scope is broad and the analysis detailed; and they often exceed five hundred pages in length. These books generally have enough material for two, three, or even four semesters. Yet, many undergraduate courses are one-semester courses. The author has often felt that students become a little uncomfortable when an instructor jumps around in a long volume searching for the

right topics, or only partially covers some topics; but they are secure in completely mastering a short, well-defined introduction. This text was written to provide a brief, one-semester introduction to partial differential equations.
Books in Print - 1991

Linear Partial Differential Equations for Scientists and Engineers - Tyn Myint-U

2007-04-05

This significantly expanded fourth edition is designed as an introduction to the theory and applications of linear PDEs. The authors provide fundamental concepts, underlying principles, a wide range of applications, and various methods of solutions to PDEs. In addition to essential standard material on the subject, the book contains new material that is not usually covered in similar texts and reference books. It also contains a large number of worked examples and exercises dealing with problems in fluid mechanics, gas dynamics, optics, plasma physics,

elasticity, biology, and chemistry; solutions are provided.

Partial Differential Equations of Mathematical Physics - Tyn Myint U. 1980

Introduction to Hilbert Spaces with Applications -

Lokenath Debnath 2005-09-29

Building on the success of the two previous editions, Introduction to Hilbert Spaces with Applications, Third Edition, offers an overview of the basic ideas and results of Hilbert space theory and functional analysis. It acquaints students with the Lebesgue integral, and includes an enhanced presentation of results and proofs. Students and researchers will benefit from the wealth of revised examples in new, diverse applications as they apply to optimization, variational and control problems, and problems in approximation theory, nonlinear instability, and bifurcation. The text also includes a popular chapter on wavelets that has been completely updated. Students

and researchers agree that this is the definitive text on Hilbert Space theory. Updated chapter on wavelets Improved presentation on results and proof Revised examples and updated applications Completely updated list of references

An Introduction to Integral Transforms - Baidyanath Patra 2018-02-13

'An Introduction to Integral Transforms' is meant for students pursuing graduate and post graduate studies in Science and Engineering. It contains discussions on almost all transforms for normal users of the subject. The content of the book is explained from a rudimentary stand point to an advanced level for convenience of its readers. Pre-requisite for understanding the subject matter of the book is some knowledge on the complex variable techniques. Please note: Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.

Advances in Nonlinear Waves -

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Lokenath Debnath 1984

Ordinary Differential Equations - D. Somasundaram 2001

Though ordinary differential equations is taught as a core course to students in mathematics and applied mathematics, detailed coverage of the topics with sufficient examples is unique. Written by a mathematics professor and intended as a textbook for third- and fourth-year undergraduates, the five chapters of this publication give a precise account of higher order differential equations, power series solutions, special functions, existence and uniqueness of solutions, and systems of linear equations. Relevant motivation for different concepts in each chapter and discussion of theory and problems-without the omission of steps-sets Ordinary Differential Equations: A First Course apart from other texts on ODEs. Full of distinguishing examples and containing exercises at the end of each chapter, this lucid

course book will promote self-study among students.

Wavelet Transforms and Their Applications - Lokenath Debnath 2014-11-25

This textbook is an introduction to wavelet transforms and accessible to a larger audience with diverse backgrounds and interests in mathematics, science, and engineering. Emphasis is placed on the logical development of fundamental ideas and systematic treatment of wavelet analysis and its applications to a wide variety of problems as encountered in various interdisciplinary areas. Topics and Features: * This second edition heavily reworks the chapters on Extensions of Multiresolution Analysis and Newlands's Harmonic Wavelets and introduces a new chapter containing new applications of wavelet transforms * Uses knowledge of Fourier transforms, some elementary ideas of Hilbert spaces, and orthonormal systems to develop the theory and applications of wavelet analysis * Offers detailed and clear

explanations of every concept and method, accompanied by carefully selected worked examples, with special emphasis given to those topics in which students typically experience difficulty * Includes carefully chosen end-of-chapter exercises directly associated with applications or formulated in terms of the mathematical, physical, and engineering context and provides answers

to selected exercises for additional help
Mathematicians, physicists, computer engineers, and electrical and mechanical engineers will find Wavelet Transforms and Their Applications an exceptionally complete and accessible text and reference. It is also suitable as a self-study or reference guide for practitioners and professionals.