Ordinary Differential Equations Dover Books On Mathematics

Abstract Methods in Partial Differential EquationsDifferential Equations with ApplicationsDifferential EquationsOrdinary Differential EquationsPartial Differential Equations with Fourier Series and Boundary Value ProblemsOrdinary Differential EquationsAn Introduction to MathematicsAsymptotic Expansions for Ordinary Differential EquationsThe Qualitative Theory of Ordinary Differential EquationsPartial Differential EquationsAn Introduction to Ordinary Differential EquationsNonlinear Differential EquationsLectures on Partial Differential EquationsLectures on Ordinary Differential EquationsIntroduction to Partial Differential Equations with ApplicationsTopics in Ordinary Differential EquationsOrdinary Differential EquationsLaplace Transforms and Their Applications to Differential EquationsOrdinary Differential Equations and Their SolutionsDifferential EquationsLinear AlgebraOrdinary Differential EquationsDifferential Equations and Their ApplicationsSolution Manual for Partial Differential Equations for Scientists and EngineersOrdinary Differential EquationsAn Introduction To Ordinary Differential EquationsTensors, Differential Forms, and Variational PrinciplesHill's EquationElements of Partial Differential EquationsStability Theory of Differential EquationsA Second Course in Elementary Differential EquationsOrdinary Differential Equations and Stability Theory:Introduction to Nonlinear Differential and Integral EquationsLectures on Ordinary Differential

EquationsOrdinary Differential Equations in the Complex DomainIntroduction to Linear Algebra and Differential EquationsPartial Differential EquationsOrdinary Differential EquationsExistence Theorems for Ordinary Differential EquationsOrdinary Differential Equations

Abstract Methods in Partial Differential Equations

Examines the history and development of mathematical concepts and how the contemporary student may use them

Differential Equations with Applications

This outstanding text concentrates on the mathematical ideas underlying various asymptotic methods for ordinary differential equations that lead to full, infinite expansions. "A book of great value." — Mathematical Reviews. 1976 revised edition.

Differential Equations

Classic graduate-level exposition covers theory and applications to ordinary and partial differential equations. Includes derivation of Laplace transforms of various functions, Laplace transform for a finite interval, and more. 1948 edition.

Ordinary Differential Equations

First-rate introduction for undergraduates examines first order equations, complex-valued solutions, linear differential operators, the Laplace transform, Picard's existence theorem, and much more. Includes problems and solutions.

Partial Differential Equations with Fourier Series and Boundary Value Problems

A thorough, systematic first course in elementary differential equations for undergraduates in mathematics and science, requiring only basic calculus for a background. Includes many exercises and problems, with answers. Index.

Ordinary Differential Equations

For the past several years the Division of Applied Mathematics at Brown University has been teaching an extremely popular sophomore level differential equations course. The immense success of this course is due primarily to two fac tors. First, and foremost, the material is presented in a manner which is rigorous enough for our mathematics and ap plied mathematics majors, but yet intuitive and practical enough for our engineering, biology, economics, physics and geology majors. Secondly, numerous case histories are given of how researchers have used differential equations to solve real life problems. This book is the outgrowth of this course. It is a rigorous treatment of differential equations and their appli cations, and can be understood by anyone who has

had a two semester course in Calculus. It contains all the material usually covered in a one or two semester course in differen tial equations. In addition, it possesses the following unique features which distinguish it from other textbooks on differential equations.

An Introduction to Mathematics

This unusually well-written, skillfully organized introductory text provides an exhaustive survey of ordinary differential equations — equations which express the relationship between variables and their derivatives. In a disarmingly simple, step-by-step style that never sacrifices mathematical rigor, the authors — Morris Tenenbaum of Cornell University, and Harry Pollard of Purdue University — introduce and explain complex, critically-important concepts to undergraduate students of mathematics, engineering and the sciences. The book begins with a section that examines the origin of differential equations, defines basic terms and outlines the general solution of a differential equation-the solution that actually contains every solution of such an equation. Subsequent sections deal with such subjects as: integrating factors; dilution and accretion problems; the algebra of complex numbers; the linearization of first order systems; Laplace Transforms; Newton's Interpolation Formulas; and Picard's Method of Successive Approximations. The book contains two exceptional chapters: one on series methods of solving differential equations, the second on numerical methods of solving differential equations.

The first includes a discussion of the Legendre Differential Equation, Legendre Functions, Legendre Polynomials, the Bessel Differential Equation, and the Laguerre Differential Equation. Throughout the book, every term is clearly defined and every theorem lucidly and thoroughly analyzed, and there is an admirable balance between the theory of differential equations and their application. An abundance of solved problems and practice exercises enhances the value of Ordinary Differential Equations as a classroom text for undergraduate students and teaching professionals. The book concludes with an in-depth examination of existence and uniqueness theorems about a variety of differential equations, as well as an introduction to the theory of determinants and theorems about Wronskians.

Asymptotic Expansions for Ordinary Differential Equations

The Qualitative Theory of Ordinary Differential Equations

This rigorous treatment prepares readers for the study of differential equations and shows them how to research current literature. It emphasizes nonlinear problems and specific analytical methods. 1969 edition.

Partial Differential Equations

An Introduction to Ordinary Differential Equations

Nonlinear Differential Equations

This three-part treatment of partial differential equations focuses on elliptic and evolution equations. Largely self-contained, it concludes with a series of independent topics directly related to the methods and results of the preceding sections that helps introduce readers to advanced topics for further study. Geared toward graduate and postgraduate students of mathematics, this volume also constitutes a valuable reference for mathematicians and mathematical theorists. Starting with the theory of elliptic equations and the solution of the Dirichlet problem, the text develops the theory of weak derivatives, proves various inequalities and imbedding problems, and derives smoothness theorems. Part Two concerns evolution equations in Banach space and develops the theory of semigroups. It solves the initial-boundary value problem for parabolic equations and covers backward uniqueness, asymptotic behavior, and lower bounds at infinity. The final section includes independent topics directly related to the methods and results of the previous material, including the analyticity of solutions of elliptic and parabolic equations, asymptotic behavior of solutions of elliptic equations near infinity, and problems in the theory of control in Banach space.

Lectures on Partial Differential Equations

Few books on Ordinary Differential Equations (ODEs) have the elegant geometric insight of this one, which puts emphasis on the qualitative and geometric properties of ODEs and their solutions, rather than on routine presentation of algorithms. From the reviews: "Professor Arnold has expanded his classic book to include new material on exponential growth, predator-prey, the pendulum, impulse response, symmetry groups and group actions, perturbation and bifurcation." --SIAM REVIEW

Lectures on Ordinary Differential Equations

Superb, self-contained graduate-level text covers standard theorems concerning linear systems, existence and uniqueness of solutions, and dependence on parameters. Focuses on stability theory and its applications to oscillation phenomena, self-excited oscillations, more. Includes exercises.

Introduction to Partial Differential Equations with Applications

Skillfully organized introductory text examines origin of differential equations, then defines basic terms and outlines the general solution of a differential equation. Subsequent sections deal with integrating factors; dilution and accretion problems; linearization of first order systems; Laplace Transforms; Newton's Interpolation Formulas, more.

Topics in Ordinary Differential Equations

This text examines fundamental and general existence theorems, along with uniqueness theorems and Picard iterants, and applies them to properties of solutions and linear differential equations. 1954 edition.

Ordinary Differential Equations

Incisive, self-contained account of tensor analysis and the calculus of exterior differential forms, interaction between the concept of invariance and the calculus of variations. Emphasis is on analytical techniques. Includes problems.

Laplace Transforms and Their Applications to Differential Equations

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.

Ordinary Differential Equations and Their Solutions

Graduate-level text offers full treatments of existence theorems, representation of solutions by series, theory of majorants, dominants and minorants, questions of growth, much more. Includes 675

exercises. Bibliography.

Differential Equations

Covers determinants, linear spaces, systems of linear equations, linear functions of a vector argument, coordinate transformations, the canonical form of the matrix of a linear operator, bilinear and quadratic forms, Euclidean spaces, unitary spaces, quadratic forms in Euclidean and unitary spaces, finite-dimensional space. Problems with hints and answers.

Linear Algebra

Suitable for advanced undergraduates and graduate students, this text introduces the stability theory and asymptotic behavior of solutions of linear and nonlinear differential equations. 1953 edition.

Ordinary Differential Equations

Detailed treatment covers existence and uniqueness of a solution of the initial value problem, properties of solutions, properties of linear systems, stability of nonlinear systems, and two-dimensional systems. 1962 edition.

Differential Equations and Their Applications

Solution Manual for Partial Differential

Equations for Scientists and Engineers

Graduate-level exposition by noted Russian mathematician offers rigorous, readable coverage of classification of equations, hyperbolic equations, elliptic equations, and parabolic equations. Translated from the Russian by A. Shenitzer.

Ordinary Differential Equations

Excellent introductory text focuses on complex numbers, determinants, orthonormal bases, symmetric and hermitian matrices, first order non-linear equations, linear differential equations, Laplace transforms, Bessel functions, more. Includes 48 black-and-white illustrations. Exercises with solutions. Index.

An Introduction To Ordinary Differential Equations

Introductory treatment explores existence theorems for first-order scalar and vector equations, basic properties of linear vector equations, and two-dimensional nonlinear autonomous systems. "A rigorous and lively introduction." — The American Mathematical Monthly. 1958 edition.

Tensors, Differential Forms, and Variational Principles

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.

Hill's Equation

A Second Course in Elementary Differential Equations deals with norms, metric spaces, completeness, inner products, and an asymptotic behavior in a natural setting for solving problems in differential equations. The book reviews linear algebra, constant coefficient case, repeated eigenvalues, and the employment of the Putzer algorithm for nondiagonalizable coefficient matrix. The text describes, in geometrical and in an intuitive approach, Liapunov stability, qualitative behavior, the phase plane concepts, polar coordinate techniques, limit cycles, the Poincaré-Bendixson theorem. The book explores, in an analytical procedure, the existence and uniqueness theorems,

metric spaces, operators, contraction mapping theorem, and initial value problems. The contraction mapping theorem concerns operators that map a given metric space into itself, in which, where an element of the metric space M, an operator merely associates with it a unique element of M. The text also tackles inner products, orthogonality, bifurcation, as well as linear boundary value problems, (particularly the Sturm-Liouville problem). The book is intended for mathematics or physics students engaged in ordinary differential equations, and for biologists, engineers, economists, or chemists who need to master the prerequisites for a graduate course in mathematics.

Elements of Partial Differential Equations

This brief modern introduction to the subject of ordinary differential equations emphasizes stability theory. Concisely and lucidly expressed, it is intended as a supplementary text for advanced undergraduates or beginning graduate students who have completed a first course in ordinary differential equations. The author begins by developing the notions of a fundamental system of solutions, the Wronskian, and the corresponding fundamental matrix. Subsequent chapters explore the linear equation with constant coefficients, stability theory for autonomous and nonautonomous systems, and the problems of the existence and uniqueness of solutions and related topics. Problems at the end of each chapter and two Appendixes on special topics enrich the text.

Stability Theory of Differential Equations

This two-part treatment of Hill's equation encompasses the subject's most pertinent information, explaining both basic theory and numerous details, including elementary formulas, oscillatory solutions, intervals of stability and instability, discriminants, and coexistence. Particular attention is given to stability problems and the question of coexistence of periodic solutions. 1966 edition.

A Second Course in Elementary Differential Equations

This treatment presents most of the methods for solving ordinary differential equations and systematic arrangements of more than 2,000 equations and their solutions. The material is organized so that standard equations can be easily found. Plus, the substantial number and variety of equations promises an exact equation or a sufficiently similar one. 1960 edition.

Ordinary Differential Equations and Stability Theory:

Geared toward advanced undergraduates and graduate students in mathematics, engineering, and the sciences, this self-contained treatment is appropriate for a course in nonlinear system analysis. Its highlight is a scholarly treatment of the stability of dynamical systems, including the absolute stability problem. Acclaimed by IEEE Control Systems

Magazine as "a welcome addition" to books in the field of nonlinear control systems, the text opens with the modeling of a number of electrical, mechanical, and electromechanical systems, which provide the setting for later analysis. Subsequent chapters review results regarding the existence and uniqueness of solutions of ordinary differential equations; matrix analysis of the linear system of differential equations; and boundary value problems. The rest of the book is devoted chiefly to the stability of nonlinear systems, including issues of stability related to perturbations; periodic solutions of two-dimensional systems and the Poincaré-Bendixson theorem; and the stability of the equilibrium point. Each chapter is complemented with a series of well-chosen problems.

Introduction to Nonlinear Differential and Integral Equations

Covers the fundamentals of the theory of ordinary differential equations.

Lectures on Ordinary Differential Equations

"A rigorous and lively introduction . . . careful and lucid . . ."--The American Mathematical Monthly. Excellent hardcover edition. This concise and idea-rich introduction to a topic of perennial interest in mathematics is written so clearly and lucidly, it is well within the reach of senior mathematics students. It covers mainly existence theorems for first-order scalar and vector equations, basic properties of linear

vector equations, and two-dimensional nonlinear autonomous systems. Throughout, the emphasis is on geometric methods. Witold Hurewicz was a world-class mathematician whose untimely death in 1956 deprived the mathematics community of one of its leading lights. His contributions to dimension theory, homotopy and other topics are outlined by Professor Solomon Lefschetz in a prefatory article "Witold Hurewicz in Memoriam" included in this volume. Also included is a list of books on differential equations for those interested in further reading, and a bibliography of Hurewicz's published works. Unabridged Dover republication of the work originally published by MIT Press, 1958. Prefatory article "Witold Hurewicz in Memoriam" by Solomon Lefschetz. List of References. Index. 26 figures.

Ordinary Differential Equations in the Complex Domain

Complete solutions for all problems contained in a widely used text for advanced undergraduates in mathematics. Covers diffusion-type problems, hyperbolic-type problems, elliptic-type problems, and numerical and approximate methods. 2016 edition.

Introduction to Linear Algebra and Differential Equations

Topics covered include differential equations of the 1st order, the Riccati equation and existence theorems, 2nd order equations, elliptic integrals and functions, nonlinear mechanics, nonlinear integral

equations, more. Includes 137 problems.

Partial Differential Equations

Practical, concise text covers the existence and uniqueness theorem, characteristics of first-order equations, boundary problems for second-order linear equations, asymptotic methods, and differential equations in the complex field. 1961 edition.

Ordinary Differential Equations

Coherent, balanced introductory text focuses on initial- and boundary-value problems, general properties of linear equations, and the differences between linear and nonlinear systems. Includes large number of illustrative examples worked out in detail and extensive sets of problems. Answers or hints to most problems appear at end.

Existence Theorems for Ordinary Differential Equations

Detailed, self-contained treatment examines modern abstract methods in partial differential equations, especially abstract evolution equations. Suitable for graduate students with some previous exposure to classical partial differential equations. 1969 edition.

Ordinary Differential Equations

This text features numerous worked examples in its presentation of elements from the theory of partial

differential equations, emphasizing forms suitable for solving equations. Solutions to odd-numbered problems appear at the end. 1957 edition.