

A Text Book Of Differential Equations By N M Kapur In

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This introductory text explores 1st- and 2nd-order differential equations, series solutions, the Laplace transform, difference equations, much more. Numerous figures, problems with solutions, notes. 1994 edition. Includes 268 figures and 23 tables. In this book, how to solve such type equations has been elaborately described. In this book, vector differential calculus is considered, which extends the basic concepts of (ordinary) differential calculus, such as, continuity and differentiability to vector functions in a simple and natural way. This book comprises previous question papers problems at appropriate places and also previous GATE questions at the end of each chapter for the

This book offers readers a primer on the theory and applications of Ordinary Differential Equations. The style used is simple, yet thorough and rigorous. Each chapter ends with a broad set of exercises that range from the routine to the more challenging and thought-provoking. Solutions to selected exercises can be found at the end of the book. The book contains many interesting examples on topics such as electric circuits, the pendulum equation, the logistic equation, the Lotka-Volterra system, the Laplace Transform, etc., which introduce students to a number of interesting aspects of the theory and applications. The work is mainly intended for students of Mathematics, Physics, Engineering, Computer Science and other areas of the natural and social sciences that use ordinary differential equations, and who have a firm grasp of Calculus and a minimal understanding of the basic concepts used in Linear Algebra. It also studies a few more advanced topics, such as Stability Theory and Boundary Value Problems, which may be suitable for more advanced undergraduate or first-year graduate students. The second edition has been revised to correct minor errata, and features a number of carefully selected new exercises, together with more detailed explanations of some of the topics. A complete Solutions Manual, containing solutions to all the exercises published in the book, is available. Instructors who wish to adopt the book may request the manual by writing directly to one of the authors.

For over 300 years, differential equations have served as an essential tool for describing and analyzing problems in many scientific disciplines. This carefully-written textbook provides an introduction to many of the important topics associated with ordinary differential equations. Unlike most textbooks on the subject, this text includes nonstandard topics such as perturbation methods and differential equations and Mathematica. In addition to the nonstandard topics, this text also contains contemporary material in the area as well as its classical topics. This second edition is updated to be compatible with Mathematica, version 7.0. It also provides 81 additional exercises, a new section in Chapter 1 on the generalized logistic equation, an additional theorem in Chapter 2 concerning fundamental matrices, and many more other

enhancements to the first edition. This book can be used either for a second course in ordinary differential equations or as an introductory course for well-prepared students. The prerequisites for this book are three semesters of calculus and a course in linear algebra, although the needed concepts from linear algebra are introduced along with examples in the book. An undergraduate course in analysis is needed for the more theoretical subjects covered in the final two chapters.

The book has been divided into nine chapters. It deals the introduction to differential equation, differential equation of first order but not of first degree, the differential equation of first order and first degree, application of first order differential, linear equations, methods of variation of parameters and undetermined coefficients, linear equations of second order, ordinary simultaneous differential equation, total differential equations (Pfaffian Differential Forms and Equations). The book include fundamental concepts, illustrative examples and applications to various problems. Contents: An introduction to Differential Equations, Differential Equations of First Order but not of First Degree, Differential Equations of First Order and First Degree, Applications of first Order Differential, Linear Equations, Methods of Variation of Parameters and Undermined Coefficients, Linear Equations of Second Order, Ordinary Simultaneously Differential Equations, Total Differential Equations (Pfaffian Differential Forms and Equations).

The revised syllabus for core courses in CBCS / Semester system is being followed by all the universities in Andhra Pradesh, from the academic year 2020 - 2021. This book strictly covers the new curriculum for Course I (Semester I - 1st year, 1st semester) under this syllabus The book is intended to serve as as a textbook for undergraduate and honors students. It will be useful to the engineering and management students, and other applied areas. It will also be helpful in preparing for competitive examinations like IAS, IES, NET, PCS, and other higher education exams. Key Features: Basic concepts presented in an easy to understand style, Notes and remarks given at appropriate places, clean and clear figures given for better understanding, includes a large number of solved examples, Exercise questions at the end of each chapter, Presentation of the subject in a natural way.

A Textbook of B.Sc. Mathematics Sem II Differential Equations

This textbook is intended to serve as textbook for undergraduate and honors students. It will be useful to the engineering, management and students of other applied areas. It will also be helpful for competitive examinations like IAS, IES, NET, PCS and other higher education exams. Key Features: Provide basic concepts in an easy to understand style, Presentation of the subject in natural way, Includes large number of solved examples, Notes and remarks given at appropriate places, Clean and clear figures for better understanding, Exercise questions at the end of each chapter.

Covers ODEs and PDEs—in One Textbook Until now, a comprehensive textbook covering both ordinary differential equations (ODEs) and partial differential equations (PDEs) didn't exist. Fulfilling this need, Ordinary and Partial Differential Equations provides a complete and accessible course on ODEs and PDEs using many examples and exercises as well as intuitive, easy-to-use software. Teaches the Key Topics in Differential Equations The text includes all the topics that form the core of a modern undergraduate or beginning graduate course in differential equations. It also discusses other optional but important topics such as integral equations, Fourier series, and special functions. Numerous carefully chosen examples offer practical guidance on the concepts and techniques. Guides Students through the Problem-Solving Process Requiring no user programming, the accompanying computer software allows students to fully investigate problems, thus enabling a deeper study into the role of boundary

and initial conditions, the dependence of the solution on the parameters, the accuracy of the solution, the speed of a series convergence, and related questions. The ODE module compares students' analytical solutions to the results of computations while the PDE module demonstrates the sequence of all necessary analytical solution steps.

This book is intended to serve as a Textbook for Undergraduate and Post - graduate students of Mathematics. It will be useful to the researchers working in the field of Differential geometry and its applications to general theory of relativity and other applied areas. It will also be helpful in preparing for the competitive examinations like IAS, IES, NET, PCS, and UP Higher Education exams. The text starts with a chapter on Preliminaries discussing basic concepts and results which would be taken for general later in the subsequent chapters of this book.

This is followed by the Study of the Tensors Algebra and its operations and types, Christoffel's symbols and its properties, the concept of covariant differentiation and its properties, Riemann's symbols and its properties, and application of tensor in different areas in part – I and the study of the Theory of Curves in Space, Concepts of a Surface and Fundamental forms, Envelopes and Developables, Curvature of Surface and Lines of Curvature, Fundamental Equations of Surface Theory, Theory of Geodesics, Differentiable Manifolds and Riemannian Manifold and Application of Differential Geometry in Part –II. **KEY FEATURES:**

Provides basic Concepts in an easy to understand style; Presentation of the subject in a natural way; Includes a large number of solved examples and illuminating illustrations; Exercise questions at the end of the topic and at the end of each chapter; Proof of the theorems are given in an easy to understand style; Neat and clean figures are given at appropriate places; Notes and remarks are given at appropriate places.

Calculus is a powerful mathematical tool with applications in almost every branch of science and engineering. This subject is therefore considered to occupy the central position in mathematics. The third edition of Textbook of Differential Calculus is thoroughly revised as per the latest syllabi of various Indian universities for undergraduate courses in mathematics and engineering. The text is designed with rich collection of solved examples and problems to motivate students. Calculus is best understood via geometry. A major section of the text is devoted to topics on geometrical applications of calculus that includes treatment of topics such as tangents and normal to curves, curvature, asymptotes, maxima and minima of functions. **KEY FEATURES**

- A large number of solved examples, section-end questions and theorems help to build an intuitive understanding of mathematics.
- Questions have been selected from previous years' examination papers.
- Multiple-choice questions, with answers, at the end of the book, help students to prepare for competitive examinations.

NEW TO THE THIRD EDITION

- Provides several new examples in the existing chapters
- Includes a new chapter on Jacobians (Chapter 6)

Ordinary differential equations serve as mathematical models for many exciting real world problems. Rapid growth in the theory and applications of differential equations has resulted in a continued interest in their study by students in many disciplines. This textbook organizes material around theorems and proofs, comprising of 42 class-tested lectures that effectively convey the subject in easily manageable sections. The presentation is driven by detailed examples that illustrate how the subject works. Numerous exercise sets, with an "answers and hints" section, are included. The book further provides a background and history

of the subject.

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.

This book on Differential Calculus has been written for the use of the students of degree and honours classes of Indian Universities. The subject matter has been discussed in such a simple way that the students will find no difficulty to understand it. The theories and articles have been explained in detailed in a nice manner and all the examples have been completely solved. Self practice problems in such chapter will help students self evaluation. Hints and answers to self practice problems enable to students learn at their own pace. The book contains almost all the questions set at various examinations held by Indian Universities and it covers to syllabi of all Indian Universities. Contents: Function of Real Variable, Limits, Continuity and Differentiability, Rolle's Theorem, Mean Value Theorems, Taylor's and Maclaurin's Theorems, Differentiation, Successive Differentiation, Expansions of Functions, Partial Differential, Indeterminate Forms, Tangents and Norms, Curvature, Asymptotes.

This Textbook of B.Sc Mathematics is for the students studying First year in all universities of Andhra Pradesh. The revised syllabus is being adopted by all the universities in Andhra Pradesh, following Common Core model curriculum from the academic year 2015 - 2016 (revised in 2016) based on CBCS (Choice Based Credit System). This book strictly covers the new curriculum for 1st year's Semester-I).

The third edition of this concise, popular textbook on elementary differential equations gives instructors an alternative to the many voluminous texts on the market. It presents a thorough treatment of the standard topics in an accessible, easy-to-read, format. The overarching perspective of the text conveys that differential equations are about applications. This book illuminates the mathematical theory in the text with a wide variety of applications that will appeal to students in physics, engineering, the biosciences, economics and mathematics. Instructors are likely to find that the first four or five chapters are suitable for a first course in the subject. This edition contains a healthy increase over earlier editions in the number of worked examples and exercises, particularly those routine in nature. Two appendices include a review with practice problems, and a MATLAB® supplement that gives basic codes and commands for solving differential equations. MATLAB® is not required; students are encouraged to utilize available software to plot many of their solutions. Solutions to even-numbered problems are available on springer.com.

Written in a clear, precise and readable manner, this textbook (now revised and corrected) is designed to provide postgraduate mathematics students with a sound and inspiring introduction to the main themes of ordinary differential

equations. It is presented from the viewpoint of applied mathematics to treat differential equations both from the theoretical background and practical applications to scientific and engineering problems. Beginning with a comprehensive treatment of linear differential equations with variable coefficients, the text gives a detailed discussion on some well-known special functions which provide solutions of second order linear ordinary differential equations having several regular singular points. Many of the standard concepts and methods which are useful in the study of special functions are discussed. The properties of special functions are derived from their differential equations and boundary conditions. Finally, existence and uniqueness of solutions of differential equations are established. Worked-out examples are introduced throughout the text. End-of-chapter exercises further help understand the mathematical and physical structure of the subject.

This is a textbook on differential geometry well-suited to a variety of courses on this topic. For readers seeking an elementary text, the prerequisites are minimal and include plenty of examples and intermediate steps within proofs, while providing an invitation to more excursive applications and advanced topics. For readers bound for graduate school in math or physics, this is a clear, concise, rigorous development of the topic including the deep global theorems. For the benefit of all readers, the author employs various techniques to render the difficult abstract ideas herein more understandable and engaging. Over 300 color illustrations bring the mathematics to life, instantly clarifying concepts in ways that grayscale could not. Green-boxed definitions and purple-boxed theorems help to visually organize the mathematical content. Color is even used within the text to highlight logical relationships. Applications abound! The study of conformal and equiareal functions is grounded in its application to cartography. Evolutes, involutes and cycloids are introduced through Christiaan Huygens' fascinating story: in attempting to solve the famous longitude problem with a mathematically-improved pendulum clock, he invented mathematics that would later be applied to optics and gears. Clairaut's Theorem is presented as a conservation law for angular momentum. Green's Theorem makes possible a drafting tool called a planimeter. Foucault's Pendulum helps one visualize a parallel vector field along a latitude of the earth. Even better, a south-pointing chariot helps one visualize a parallel vector field along any curve in any surface. In truth, the most profound application of differential geometry is to modern physics, which is beyond the scope of this book. The GPS in any car wouldn't work without general relativity, formalized through the language of differential geometry. Throughout this book, applications, metaphors and visualizations are tools that motivate and clarify the rigorous mathematical content, but never replace it.

A Text Book of Differential Equations Pitambar Publishing

Calculus is central to all branches of science and engineering. This book on Differential Calculus is written according to the UGC Model Curriculum and presents an integrated study of the subject to BA/BSc and engineering students

and also those aspiring

An Integral Part Of College Mathematics, Finds Application In Diverse Areas Of Science And Engineering. This Book Covers The Subject Of Ordinary And Partial Differential Equations In Detail. There Are Nineteen Chapters And Eight Appendices Covering Diverse Topics Including Numerical Solution Of First Order Equations, Existence Theorem, Solution In Series, Detailed Study Of Partial Differential Equations Of Second Order Etc. This Book Fully Covers The Latest Requirement Of Graduation And Postgraduate Courses.

A Textbook of B.Sc. Mathematics Differential & Integral Calculus

A Textbook of B.Sc. Mathematics

Primarily intended for the undergraduate and postgraduate students of mathematics, this textbook covers both geometry and tensor in a single volume. This book aims to provide a conceptual exposition of the fundamental results in the theory of tensors. It also illustrates the applications of tensors to differential geometry, mechanics and relativity. Organized in ten chapters, it provides the origin and nature of the tensor along with the scope of the tensor calculus.

Besides this, it also discusses N-dimensional Riemannian space, characteristic peculiarity of Riemannian space, intrinsic property of surfaces, and properties and transformation of Christoffel's symbols. Besides the students of mathematics, this book will be equally useful for the postgraduate students of physics. **KEY FEATURES :** Contains 250 worked out examples Includes more than 350 unsolved problems Gives thorough foundation in Tensors

This book presents a variety of techniques for solving ordinary differential equations analytically and features a wealth of examples. Focusing on the modeling of real-world phenomena, it begins with a basic introduction to differential equations, followed by linear and nonlinear first order equations and a detailed treatment of the second order linear equations. After presenting solution methods for the Laplace transform and power series, it lastly presents systems of equations and offers an introduction to the stability theory. To help readers practice the theory covered, two types of exercises are provided: those that illustrate the general theory, and others designed to expand on the text material. Detailed solutions to all the exercises are included. The book is excellently suited for use as a textbook for an undergraduate class (of all disciplines) in ordinary differential equations.

This textbook is a comprehensive treatment of ordinary differential equations, concisely presenting basic and essential results in a rigorous manner. Including various examples from physics, mechanics, natural sciences, engineering and automatic theory, Differential Equations is a bridge between the abstract theory of differential equations and applied systems theory. Particular attention is given to the existence and uniqueness of the Cauchy problem, linear differential systems, stability theory and applications to first-order partial differential equations. Upper undergraduate students and researchers in applied mathematics and systems theory with a background in advanced calculus will

find this book particularly useful. Supplementary topics are covered in an appendix enabling the book to be completely self-contained.

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