Tensor Analysis De Gruyter Textbook

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Cartesian Tensors Princeton University Press
Revised and updated throughout, this book presents the fundamental concepts of vector and tensor analysis with their corresponding physical and geometric applications - emphasizing the development of computational skills and basic procedures, and exploring highly complex and technical topics in simplified settings.;This text: incorporates transformation of rectangular cartesian coordinate systems and the invariance of the gradient, divergence and the curl into the discussion of tensors; combines the test for independence of path and the path independence sections; offers new examples and figures that demonstrate computational methods, as well as carify concepts; introduces subtitles in each section to highlight the appearance of new topics; provides definitions and theorems in boldface type for easy identification. It also contains numerical exercises of varying levels of difficulty and many problems solved.
Tensor Analysis Courier Corporation
Tensors, or hypermatrices, are multi-arrays with more than two indices. In the last decade or so, many concepts and results in matrix theory?some of which are nontrivial?have been extended to tensors and have a wide range of applications (for example, spectral hypergraph theory, higher order Markov chains, polynomial optimization, magnetic resonance imaging, automatic control, and quantum entanglement problems). The authors provide a comprehensive discussion of this new theory of tensors. Tensor Analysis: Spectral Theory and Special Tensors is unique in that it is the first book on these three subject areas: spectral theory of tensors; the theory of special tensors, including nonnegative tensors, positive semidefinite tensors, completely positive tensors, and copositive tensors; and the spectral hypergraph theory via tensors.
Tensor Analysis on Manifolds Princeton University Press
An introduction to the theory of Cartesian tensors, this text notes the importance of the analysis of the structure of tensors in terms of spectral sets of projection operators as part of the very substance of quantum theory. Covers isotropic tensors and spinor analysis within the confines of Euclidean space; and tensors in orthogonal curvilinear coordinates. Examples. 1960 edition.
Tensor Analysis Courier Corporation
This textbook provides a rigorous approach to tensor manifolds in several aspects relevant for Engineers and Physicists working in industry or academia. With a thorough, comprehensive, and unified presentation, this book offers insights into several topics of tensor analysis, which covers all aspects of n-dimensional spaces. The main purpose of this book is to give a self-contained yet simple, correct and comprehensive mathematical explanation of tensor calculus for undergraduate and graduate students and for professionals. In addition to many worked problems, this book features a selection of examples, solved step by step. Although no emphasis is placed on special and particular problems of Engineering or Physics, the text covers the fundamentals of these fields of science. The book makes a brief introduction into the basic concept of the tensorial formalism so as to allow the reader to make a quick and easy review of the essential topics that enable having the grounds for the subsequent themes, without needing to resort to other bibliographical sources on tensors. Chapter 1 deals with Fundamental Concepts about tensors and chapter 2 is devoted to the study of covariant, absolute and contravariant derivatives. The chapters 3 and 4 are dedicated to the Integral Theorems and Differential Operators, respectively. Chapter 5 deals with Riemann Spaces, and finally the chapter 6 presents a concise study of the Parallelism of Vectors. It also shows how to solve various problems of several particular manifolds.
Tensors and Riemannian Geometry Walter de Gruyter GmbH & Co KG
This book is based on the experience of teaching the subject by the author in Russia, France, South Africa and Sweden. The author provides students and teachers with an easy to follow textbook spanning a variety of topics on tensors, Riemannian geometry and geometric approach to partial differential equations. Application of approximate transformation groups to the equations of general relativity in the de Sitter space simplifies the subject significantly.
A Brief on Tensor Analysis CRC Press
This book offers a compact overview on crystallography, symmetry, and applications of symmetry concepts. The author explains the theory behind scattering and diffraction of electromagnetic radiation. X-ray diffraction on single crystals as well as quantitative evaluation of powder patterns are discussed.
Tensor Analysis and Nonlinear Tensor Functions Walter de Gruyter
This is a high level introduction to abstract algebra which is aimed at readers whose interests lie in mathematics and in the information and physical sciences. In addition to introducing the main concepts of modern algebra, the book contains numerous applications, which are intended to illustrate the concepts and to convince the reader of the utility and relevance of algebra today. In particular applications to Polya coloring theory, latin squares, Steiner systems and error correcting codes are described. Another feature of the book is that group theory and ring theory are carried further than is often done at this level. There is ample material here for a two semester course in abstract algebra. The importance of proof is stressed and rigorous proofs of almost all results are given. But care has been taken to lead the reader through the proofs by gentle stages. There are nearly 400 problems, of varying degrees of difficulty, to test the reader's skill and progress. The book should be suitable for students in the third or fourth year of study at a North American university or in the second or third year at a university in Europe, and should ease the transition to (post)graduate studies.
Irreducible Cartesian Tensors Springer
This book offers an introduction to differential geometry for the non-specialist. It includes most of the required material from multivariable calculus, linear algebra, and basic analysis. An intuitive approach and a minimum of prerequisites make it a valuable companion for students of mathematics and physics. The main focus is on manifolds in Euclidean space and the metric properties they inherit from it. Among the topics discussed are curvature and how it affects the shape of space, and the generalization of the fundamental theorem of calculus known as Stokes' theorem.
Tensor Numerical Methods in Scientific Computing World Scientific
Fundamental introduction of absolute differential calculus and for those interested in applications of tensor calculus to mathematical physics and engineering. Topics include spaces and tensors; basic operations in Riemannian space, curvature of space, more.
Concepts from Tensor Analysis and Differential Geometry SIAM
When applied to multidimensional problems, conventional numerical methods suffer from the so-called "curse of dimensionality", which cannot be eliminated by parallel methods and high-performance computers. In this book, the authors explain basic
Tensor Analysis Walter de Gruyter GmbH & Co KG
When I was an undergraduate, working as a co-op student at North American Aviation, I tried to learn something about tensors. In the Aeronautical En gineering Department at MIT, I had just finished an introductory course in classical mechanics that so impressed me that to this day I cannot watch a plane in flight-especially in a tum-without imaging it bristling with vec tors. Near the end of the course the professor showed that, if an airplane is treated as a rigid body, there arises a mysterious collection of rather simple looking integrals called the components of the moment of inertia tensor. Tensor-what power those two syllables seemed to resonate. I had heard the word once before, in an aside by a graduate instructor to the cognoscenti in the front row of a course in strength of materials. "What the book calls stress is actually a tensor. . . ." With my interest twice piqued and with time off from fighting the brush fires of a demanding curriculum, I was ready for my first serious effort at self instruction. In Los Angeles, after several tries, I found a store with a book on tensor analysis. In my mind I had rehearsed the scene in which a graduate stu dent or professor, spying me there, would shout, "You're an undergraduate.
Tensor Analysis Courier Corporation
This graduate textbook begins by introducing Tensors and Riemannian Spaces, and then elaborates their application in solving second-order differential equations, and ends with introducing theory of relativity and de Sitter space. Based on 40 years o
Multivariable Calculus and Differential Geometry Courier Corporation
Book 3 in the Princeton Mathematical Series. Originally published in 1950. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.
Quantum Mechanics Courier Corporation
The subject of Tensor Analysis deals with the problem of the formulation of the relation between various entities in forms which remain invariant when we pass from one system of coordinates to another. The invariant form of equation is necessarily related to the possible system of coordinates with reference to which the equation remains invariant. The primary purpose of this book is the study of the invariance form of equation relative to the totally of the rectangular co-ordinate system in the three-dimensional Euclidean space. We start with the consideration of the way the sets representing various entities are transformed when we pass from one system of rectangular co-ordinates to another. A Tensor may be a physical entity that can be described as a Tensor only with respect to the manner of its representation by means of multi-sux sets associated with different system of axes such that the sets associated with different system of co-ordinate obey the transformation law for Tensor. We have employed sux notation for tensors of any order, we could also employ single letter such A,B to denote Tensors.
Vector & Tensor Analysis Walter de Gruyter GmbH & Co KG
Standard work applies tensorial methods to subjects within realm of advanced college mathematics. Text explains fundamental ideas and notation of tensor theory; covers geometrical treatment of tensor algebra; introduces theory of differentiation of tensors; and applies mathematics to dynamics, electricity, elasticity and hydrodynamics. 685 exercises, most with answers.
Tensoranalysis Academic Publishers
Tensor calculus is a prerequisite for many tasks in physics and engineering. This book introduces the symbolic and the index notation side by side and offers easy access to techniques in the field by focusing on algorithms in index notation. It explains the required algebraic tools and contains numerous exercises with answers, making it suitable for self study for students and researchers in areas such as solid mechanics, fluid mechanics, and electrodynamics. ContentsAlgebraic ToolsTensor Analysis in Symbolic Notation and in Cartesian CoordinatesAlgebra of Second Order TensorsTensor Analysis in Curvilinear CoordinatesRepresentation of Tensor FunctionsAppendices: Solutions to the Problems; Cylindrical Coordinates and Spherical Coordinates
Tensor Calculus for Engineers and Physicists Walter de Gruyter GmbH & Co KG
There is a large gap between engineering courses in tensor algebra on one hand, and the treatment of linear transformations within classical linear algebra on the other. This book addresses primarily engineering students with some initial knowledge of matrix algebra. Thereby, mathematical formalism is applied as far as it is absolutely necessary. Numerous exercises provided in the book are accompanied by solutions enabling autonomous study. The last chapters deal with modern developments in the theory of isotropic and anisotropic tensor functions and their applications to continuum mechanics and might therefore be of high interest for PhD-students and scientists working in this area.
An Introduction to Tensor Analysis Walter de Gruyter
The authors present a rigorous treatment of the first principles of the algebraic and analytic core of quantum field theory. Their aim is to correlate modern mathematical theory with the explanation of the observed process of particle production and of particle-wave duality that heuristic quantum field theory provides. Many topics are treated here in book form for the first time, from the origins of complex structures to the quantization of tachyons and domains of dependence for quantized wave equations. This work begins with a comprehensive analysis, in a universal format, of the structure and characterization of free fields, which is illustrated by applications to specific fields. Nonlinear local functions of both free fields (or Wick products) and interacting fields are established mathematically in a way that is consistent with the basic physical constraints and practice. Among other topics discussed are functional integration, Fourier transforms in Hilbert space, and implementability of canonical transformations. The authors address readers interested in fundamental mathematical physics and who have at least the training of an entering graduate student. A series of lexicons connects the mathematical development with the underlying physical motivation or interpretation. The examples and problems illustrate the theory and relate it to the scientific literature. Originally published in 1992. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished

backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

Tensor Analysis Courier Corporation

This undergraduate-level text provides an introduction to isotropic tensors and spinor analysis, with numerous examples that illustrate the general theory and indicate certain extensions and applications. 1960 edition.

Introduction to Differential Geometry Courier Corporation

Tensor analysis is an essential tool in any science (e.g. engineering, physics, mathematical biology) that employs a continuum description. This concise text offers a straightforward treatment of the subject suitable for the student or practicing engineer. The final chapter introduces the reader to differential geometry, including the elementary theory of curves and surfaces. A well-organized formula list, provided in an appendix, makes the book a very useful reference. A second appendix contains full hints and solutions for the exercises. Undergraduates in engineering or physics, and engineers.