

A Course In Linear Algebra

suitable for advanced undergraduates and graduate students this text introduces basic concepts of linear algebra each chapter contains an introduction definitions and propositions in addition to multiple examples lemmas theorems corollaries and proofs each chapter features numerous supplemental exercises and solutions to selected problems appear at the end 1988 edition

an introduction to the basic concepts of linear algebra along with an introduction to the techniques of formal mathematics numerous worked examples and exercises along with precise statements of definitions and complete proofs of every theorem make the text ideal for independent study

this textbook for senior undergraduate and first year graduate level courses in linear algebra and analysis covers linear algebra multilinear algebra canonical forms of matrices normal linear vector spaces and inner product spaces these topics provide all of the prerequisites for graduate students in mathematics to prepare for advanced level work in such areas as algebra analysis topology and applied mathematics

this is a short readable introduction to basic linear algebra as usually encountered in a first course the development of the subject is integrated with a large number of worked examples that illustrate the ideas and methods the format of the book with text and relevant examples on facing pages means that the reader can follow the text uninterrupted the student should be able to work through the book and learn from it sequentially stress is placed on applications of the methods rather than on developing a logical system of theorems numerous exercises are provided

the text itself is well written each chapter begins with a brief synopsis which nicely captures the heart of the chapter and there are enough boldface headings and vocabulary to keep the reader oriented to the task at hand maa reviews a first course in linear algebra is written by two experts from algebra who have more than 20 years of experience in algebra linear algebra and number theory it prepares students with no background in linear algebra students after mastering the materials in this textbook can already understand any linear algebra used in more advanced books and research papers in mathematics or in other scientific disciplines this book provides a solid foundation for the theory dealing with finite dimensional vector spaces

it explains in details the relation between linear transformations and matrices one may thus use different viewpoints to manipulate a matrix instead of a one sided approach although most of the examples are for real and complex matrices a vector space over a general field is briefly discussed several optional sections are devoted to applications to demonstrate the power of linear algebra

the book is an introduction to linear algebra intended as a textbook for the first course in linear algebra in the first six chapters we present the core topics matrices the vector space on orthogonality in on determinants eigenvalues and eigenvectors and linear transformations the book gives students an opportunity to better understand linear algebra in the next three chapters jordan forms by examples singular value decomposition and quadratic forms and positive definite matrices in the first nine chapters everything is formulated in terms of on this makes the ideas of linear algebra easier to understand the general vector spaces are introduced in chapter 10 the last chapter presents problems solved with a computer algebra system at the end of the book we have results or solutions for odd numbered exercises

the book is an introduction to linear algebra with an account of its principal applications it is addressed to students of mathematics the physical engineering and social sciences and commerce the reader is assumed to have completed the calculus sequence special features of the book are thorough coverage of all core areas of linear algebra with a detailed account of such important applications as least squares systems of linear recurrences markov processes and systems of differential equations the book also gives an introduction to some more advanced topics such as diagonalization of hermitian matrices and jordan form a principal aim of the book is to make the material accessible to the reader who is not a mathematician without loss of mathematical rigor this is reflected in a wealth of examples the clarity of writing and the organization of material there is a growing need for knowledge of linear algebra that goes beyond the basic skills of solving systems of linear equations and this book is intended to meet it

developed from the author s successful two volume calculus text this book presents linear algebra without emphasis on abstraction or formalization to accommodate a variety of backgrounds the text begins with a review of prerequisites divided

into precalculus and calculus prerequisites it continues to cover vector algebra analytic geometry linear spaces determinants linear differential equations and more

linear algebra is a fundamental tool in many fields including mathematics and statistics computer science economics and the physical and biological sciences this undergraduate textbook offers a complete second course in linear algebra tailored to help students transition from basic theory to advanced topics and applications concise chapters promote a focused progression through essential ideas and contain many examples and illustrative graphics in addition each chapter contains a bullet list summarising important concepts and the book includes over 600 exercises to aid the reader's understanding topics are derived and discussed in detail including the singular value decomposition the jordan canonical form the spectral theorem the qr factorization normal matrices hermitian matrices of interest to physics students and positive definite matrices of interest to statistics students

linear algebra a first course with applications explores the fundamental ideas of linear algebra including vector spaces subspaces basis span linear independence linear transformation eigenvalues and eigenvectors as well as a variety of applications from inventories to graphics to google's pagerank unlike other texts on the subject thi

in order not to intimidate students by a too abstract approach this textbook on linear algebra is written to be easy to digest by non mathematicians it introduces the concepts of vector spaces and mappings between them without dwelling on statements such as theorems and proofs too much it is also designed to be self contained so no other material is required for an understanding of the topics covered as the basis for courses on space and atmospheric science remote sensing geographic information systems meteorology climate and satellite communications at un affiliated regional centers various applications of the formal theory are discussed as well these include differential equations statistics optimization and some engineering motivated problems in physics contents vectors matrices determinants eigenvalues and eigenvectors some applications of matrices and determinants matrix series and additional properties of matrices

this innovative intermediate level statistics text fills an important gap by presenting the theory of linear statistical models at a level appropriate for senior undergraduate or first year graduate students with an innovative approach the author s introduces students to the mathematical and statistical concepts and tools that form a foundation for studying the theory and applications of both univariate and multivariate linear models a first course in linear model theory systematically presents the basic theory behind linear statistical models with motivation from an algebraic as well as a geometric perspective through the concepts and tools of matrix and linear algebra and distribution theory it provides a framework for understanding classical and contemporary linear model theory it does not merely introduce formulas but develops in students the art of statistical thinking and inspires learning at an intuitive level by emphasizing conceptual understanding the authors fresh approach methodical presentation wealth of examples and introduction to topics beyond the classical theory set this book apart from other texts on linear models it forms a refreshing and invaluable first step in students study of advanced linear models generalized linear models nonlinear models and dynamic models

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