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KEY=CONCEPTS - JOHNSON DALE

LINEAR PROGRAMMING

AN INTRODUCTION

SAGE **Linear Programming is a well-written introduction to the techniques and applications of linear programming. It clearly shows readers how to model, solve, and interpret appropriate linear programming problems. Feiring has presented several carefully-chosen examples which provide a foundation for mathematical modelling and demonstrate the wide scope of the techniques. He subsequently develops an understanding of the Simplex Method and Sensitivity Analysis and includes a discussion of computer codes for linear programming. This book should encourage the spread of linear programming techniques throughout the social sciences and, since it has been developed from Feiring's own class notes, it is ideal for students, particularly those with a limited background in quantitative methods.**

LINEAR PROGRAMMING AND ECONOMIC ANALYSIS

Courier Corporation **Clear, comprehensive exposition of interrelation of game theory and linear programming, interrelation of linear programming and modern welfare economics, Leontief theory of input-output, problems of dynamic linear programming, more.**

LINEAR PROGRAMMING 1

INTRODUCTION

Springer Science & Business Media **Encompassing all the major topics students will encounter in courses on the subject, the authors teach both the underlying mathematical foundations and how these ideas are implemented in practice. They illustrate all the concepts with both worked examples and plenty of exercises, and, in addition, provide software so that students can try out numerical methods and so hone their skills in interpreting the results. As a result, this will make an ideal textbook for all those coming to the subject for the first time. Authors' note: A problem recently found with the software is due to a bug in Formula One, the third party commercial software package that was used for the development of the interface. It occurs when the date, currency, etc. format is set to a non-United States version. Please try setting your computer date/currency option to the United States option . The new version of Formula One, when ready, will be posted on WWW.**

PREDICTIVE CONTROL FOR LINEAR AND HYBRID SYSTEMS

Cambridge University Press **With a simple approach that includes real-time applications and algorithms, this book covers the theory of model predictive control (MPC).**

EXTENSION OF DATA ENVELOPMENT ANALYSIS WITH PREFERENCE INFORMATION

VALUE EFFICIENCY

Springer **This book provides an introduction to incorporating preference information in Data Envelopment Analysis (DEA) with a special emphasis in Value Efficiency Analysis. In addition to theoretical considerations, numerous illustrative examples are included. Hence, the book can be used as a teaching text as well. Only a modest mathematical background is needed to understand the main principles. The only prerequisites are a) familiarity with linear algebra, especially matrix calculus; b) knowledge of the simplex method; and c) familiarity with the use of computer software. The book is organized as follows. Chapter 1 provides motivation and introduces the basic concepts. Chapter 2 provides the basic ideas and models of Data Envelopment Analysis. The efficient frontier and production possibility set concepts play an important role in all considerations. That's why these concepts are considered more closely in Chapter 3. Since the approaches introduced in this study are inspired by Multiple Objective Linear Programming, the basic concepts of this field are reviewed in Chapter 4. Chapter 5 also compares and contrasts Data Envelopment Analysis and Multiple Objective Linear Programming, providing some cornerstones for approaches presented later in the book. Chapter 6 discusses the traditional approaches to take into account preference information in DEA. In Chapter 7, Value Efficiency is introduced, and Chapter 8 discusses practical aspects. Some extensions are presented in Chapter 9, and in Chapter 10 Value Efficiency is extended to cover the case when a production possibility set is not convex. Three implemented applications are reviewed in Chapter 11.**

MATHEMATICAL PROGRAMMING

AN INTRODUCTION TO OPTIMIZATION

CRC Press **This book serves as an introductory text in mathematical programming and optimization for students having a mathematical background that includes one semester of linear algebra and a complete calculus sequence. It includes computational examples to aid students develop computational skills.**

LINEAR GENETIC PROGRAMMING

Springer Science & Business Media **Linear Genetic Programming presents a variant of Genetic Programming that evolves imperative computer programs as linear sequences of instructions, in contrast to the more traditional functional expressions or syntax trees. Typical GP phenomena, such as non-effective code, neutral variations, and code growth are investigated from the perspective of linear GP. This book serves as a reference for researchers; it includes sufficient introductory material for students and newcomers to the field.**

LINEAR PROGRAMMING WITH MATLAB

SIAM **This textbook provides a self-contained introduction to linear programming using MATLAB software to elucidate the development of algorithms and theory. Early chapters cover linear algebra basics, the simplex method, duality, the solving of large linear problems, sensitivity analysis, and parametric linear programming. In later chapters, the authors discuss quadratic programming, linear complementarity, interior-point methods, and selected applications of linear programming to approximation and classification problems. Exercises are interwoven with the theory presented in each chapter, and two appendices provide additional information on linear algebra, convexity, nonlinear functions, and on available MATLAB commands, respectively. Readers can access MATLAB codes and associated mex files at a Web site maintained by the authors. Only a basic knowledge of linear algebra and calculus is required to understand this textbook, which is geared toward junior and senior-level undergraduate students, first-year graduate students, and researchers unfamiliar with linear programming.**

INTRODUCTION TO OPTIMUM DESIGN

Elsevier **Optimization is a mathematical tool developed in the early 1960's used to find the most efficient and feasible solutions to an engineering problem. It can be used to find ideal shapes and physical configurations, ideal structural designs, maximum energy efficiency, and many other desired goals of engineering. This book is intended for use in a first course on engineering design and optimization. Material for the text has evolved over a period of several years and is based on classroom presentations for an undergraduate core course on the principles of design. Virtually any problem for which certain parameters need to be determined to satisfy constraints can be formulated as a design optimization problem. The concepts and methods described in the text are quite general and applicable to all such formulations. Inasmuch, the range of application of the optimum design methodology is almost limitless, constrained only by the imagination and ingenuity of the user. The book describes the basic concepts and techniques with only a few simple applications. Once they are clearly understood, they can be applied to many other advanced applications that are discussed in the text. * Allows engineers involved in the design process to adapt optimum design concepts in their work using the material in the text. * Basic concepts of optimality conditions and numerical methods are described with simple examples, making the material high teachable and learnable. * Classroom-tested for many years to attain optimum pedagogical effectiveness.**

LINEAR NETWORKS AND SYSTEMS: ALGORITHMS AND COMPUTER-AIDED IMPLEMENTATIONS

(IN 2 VOLUMES)

World Scientific **This two-volume introductory text on modern network and system theory establishes a firm analytic foundation for the analysis, design and optimization of a wide variety of passive and active circuits. Volume 1 is devoted to the fundamentals and Volume 2 to Fourier analysis and state equations. Its prerequisites are basic calculus, dc and ac networks, matrix algebra, and some familiarity with linear differential equations. The objective of the book is to select and feature theories and concepts of fundamental importance that are amendable to a broad range of applications. A special feature of the book is that it bridges the gap between theory and practice, with abundant examples showing how theory solves problems. Recognizing that computers are common tools in modern engineering, canned computer programs are developed throughout the text, both in the time**

domain and the frequency domain. In addition to the usual materials in a linear networks and systems book, advanced topics on functions of a matrix that are closely related to the solution of the state equation are included. The reader will find the study of this material rewarding. Contents:Vol 1:Fundamental ConceptsGraphs and Network EquationsSecondary Systems of Networks EquationsSimultaneous Linear Differential EquationsLaplace TransformationNetwork AnalysisIntegral Solution-ConvolutionVol 2:Fourier Series and Signal SpectraSystem Response and Discrete Fourier SeriesFourier Transform and Continuous SpectraState EquationsSolution of State EquationsAnalytic Functions of a MatrixMatrix Computations and Similarity Reduction Readership: Electrical, computer, communication, electronics and control engineers. Keywords:Network Analysis;Circuit Analysis;Computer-Aided Analysis;CAD;Linear Network Analysis;Fourier Series And Transform;Laplace Transform;Graphs;Integral Solution;Convolution;Signal Spectra;System Response;Discrete Fourier Series;FFT;Fourier Transform;State Equations;Analytic Functions of a Matrix;Matrix Computations;Similarity Reduction;Numerical Solution;Frequency Domain Analysis;Time Domain Analysis;State Variable Technique;Network Theory;Circuit TheoryReview: "The breadth and detail of the material presented in the book make it an excellent choice for use in classroom or for individual references." Muhammad A Khaliq Circuits & Devices

NETWORK AND DISCRETE LOCATION

MODELS, ALGORITHMS, AND APPLICATIONS

John Wiley & Sons **Praise for the First Edition This book is refreshing to read since it takes an important topic... and presents it in a clear and concise manner by using examples that include visual presentations of the problem, solution methods, and results along with an explanation of the mathematical and procedural steps required to model the problem and work through to a solution." —Journal of Classification Thoroughly updated and revised, Network and Discrete Location: Models, Algorithms, and Applications, Second Edition remains the go-to guide on facility location modeling. The book offers a unique introduction to methodological tools for solving location models and provides insight into when each approach is useful and what information can be obtained. The Second Edition focuses on real-world extensions of the basic models used in locating facilities, including production and distribution systems, location-inventory models, and defender-interdictor problems. A unique taxonomy of location problems and models is also presented. Featuring examples using the author's own software—SITATION, MOD-DIST, and MENU-OKF—as well as Microsoft Office® Excel®, the book provides: • A theoretical and applied perspective on location models and algorithms • An intuitive presentation of the uses and limits of modeling techniques • An introduction to integrated location-inventory modeling and defender-interdictor models for the design of reliable facility location systems • A full range of exercises to equip readers with an understanding of the basic facility location model types Network and Discrete Location: Models, Algorithms, and Applications, Second Edition is an essential resource for practitioners in applied and discrete mathematics, operations research, industrial engineering, and quantitative geography. The book is also a useful textbook for upper-level undergraduate, graduate, and MBA courses.**

MULTIPLE CRITERIA AND MULTIPLE CONSTRAINT LEVELS LINEAR PROGRAMMING

CONCEPTS, TECHNIQUES AND APPLICATIONS

World Scientific Publishing Company **This book introduces multiple criteria and multiple constraint levels linear programming (MC2LP), which is an extension of linear programming (LP) and multiple criteria linear programming (MCLP). In the last decade, the author and a group of researchers from the USA, China, Korea, Germany, and Hungary have been working on the theory and applications of MC2LP problems. This volume integrates their main research results ranging from theoretical bases to broad areas of real world applications. The theoretical bases include the formulation of MC2LP; integer MC2LP and MC2 transportation model; fuzzy MC2LP and fuzzy duality of MC2LP; optimal system designs and contingency plans; MC2 decision support system; and MC2 computer software development. The application areas are accounting, management information systems, production planning, and telecommunications management. The book serves as a seminar text for both undergraduates and graduates who have a linear algebra or equivalent background. For practitioners, it will help in handling LP type problems in multiple decision making environment.**

INTRODUCTION TO THE THEORY AND APPLICATION OF DATA ENVELOPMENT ANALYSIS

A FOUNDATION TEXT WITH INTEGRATED SOFTWARE

Springer Science & Business Media **1 DATA ENVELOPMENT ANALYSIS Data Envelopment Analysis (DEA) was initially developed as a method for assessing the comparative efficiencies of organisational units such as the branches of a bank, schools, hospital departments or restaurants. The key in each case is that they perform feature which makes the units comparable the same function in terms of the kinds of resource they use and the types of output they produce. For example all bank branches to be compared would typically use staff and capital assets to effect income generating activities such as advancing loans, selling financial products and carrying out banking transactions on behalf of their clients. The efficiencies assessed in this context by DEA are intended to reflect the scope for resource conservation at the unit being assessed without detriment to its outputs, or alternatively, the scope for output augmentation without additional resources. The efficiencies assessed are comparative or relative because they reflect scope for resource conservation or output augmentation at one unit relative to other comparable benchmark units rather than in some absolute sense. We resort to relative rather than absolute efficiencies because in most practical contexts we lack sufficient information to derive the superior measures of absolute efficiency. DEA was initiated by Charnes Cooper and Rhodes in 1978 in their seminal paper Chames et al. (1978). The paper operationalised and extended by means of linear programming production economics concepts of empirical efficiency put forth some twenty years earlier by Farrell (1957).**

INTRODUCTION TO STOCHASTIC PROGRAMMING

Springer Science & Business Media **This rapidly developing field encompasses many disciplines including operations research, mathematics, and probability. Conversely, it is being applied in a wide variety of subjects ranging from agriculture to financial planning and from industrial engineering to computer networks. This textbook provides a first course in stochastic programming suitable for students with a basic knowledge of linear programming, elementary analysis, and probability. The authors present a broad overview of the main themes and methods of the subject, thus helping students develop an intuition for how to model uncertainty into mathematical problems, what uncertainty changes bring to the decision process, and what techniques help to manage uncertainty in solving the problems. The early chapters introduce some worked examples of stochastic programming, demonstrate how a stochastic model is formally built, develop the properties of stochastic programs and the basic solution techniques used to solve them. The book then goes on to cover approximation and sampling techniques and is rounded off by an in-depth case study. A well-paced and wide-ranging introduction to this subject.**

SELECTED WATER RESOURCES ABSTRACTS

FINANCIAL ANALYSIS, PLANNING & FORECASTING

THEORY AND APPLICATION

World Scientific **New Professor Cheng-Few Lee ranks #1 based on his publications in the 26 core finance journals, and #163 based on publications in the 7 leading finance journals (Source: Most Prolific Authors in the Finance Literature: 1959-2008 by Jean L Heck and Philip L Cooley (Saint Joseph's University and Trinity University). Based on the authors' extensive teaching, research and business experiences, this book reviews, discusses and integrates both theoretical and practical aspects of financial planning and forecasting. The book is divided into six parts: Information and Methodology for Financial Analysis, Alternative Finance Theories and Their Application, Capital Budgeting and Leasing Decisions, Corporate Policies and Their Interrelationships, Short-term Financial Decisions, Financial Planning and Forecasting, and Overview.The theories used in this book are pre-Modigliani-Miller Theorem, Modigliani-Miller Theorem, Capital Asset Pricing Model and Arbitrage Pricing Theory, and Option Pricing Theory. The interrelationships among these theories are carefully analyzed. Meaningful real-world examples of using these theories are discussed step-by-step, with relevant data and methodology. Alternative planning and forecasting models are also used to show how the interdisciplinary approach is helpful in making meaningful financial management decisions.**

PRINCIPLES OF LINEAR ALGEBRA WITH MATHEMATICA

John Wiley & Sons **A hands-on introduction to the theoretical and computational aspects of linear algebra using Mathematica® Many topics in linear algebra are simple, yet computationally intensive, and computer algebra systems such as Mathematica® are essential not only for learning to apply the concepts to computationally challenging problems, but also for visualizing many of the geometric aspects within this field of study. Principles of Linear Algebra with Mathematica uniquely bridges the gap between beginning linear algebra and computational linear algebra that is often encountered in applied settings, and the commands required to solve complex and computationally challenging problems using Mathematica are provided. The book begins with an introduction to the commands and programming guidelines for working with Mathematica. Next, the authors explore linear systems of equations and matrices, applications of linear systems and matrices, determinants, inverses, and Cramer's rule. Basic linear algebra topics, such as vectors, dot product, cross product, and vector projection are explored, as well as a unique variety of more advanced topics including rotations in space, 'rolling' a circle along a curve, and the TNB Frame. Subsequent chapters feature coverage of linear transformations from Rn to Rm, the geometry of linear and affine transformations, with an exploration of their effect on arclength, area, and volume, least squares fits, and pseudoinverses. Mathematica is used to enhance concepts and is seamlessly integrated throughout the book through symbolic manipulations, numerical computations, graphics in two and three dimensions, animations, and programming. Each section concludes with standard problems in addition to problems that were specifically designed to be solved with Mathematica, allowing readers to test their comprehension of the presented material. All related Mathematica code is available on a corresponding website, along with solutions to problems and additional topical resources. Extensively class-tested to ensure an accessible presentation, Principles of Linear Algebra with Mathematica is an excellent book for courses on linear algebra at the undergraduate level. The book is also an ideal reference for students and professionals who would like to gain a further understanding of the use of Mathematica to solve linear algebra problems.**

STRUCTURAL ANALYSIS WITH THE FINITE ELEMENT METHOD. LINEAR STATICS

VOLUME 1: BASIS AND SOLIDS

Springer Science & Business Media **STRUCTURAL ANALYSIS WITH THE FINITE ELEMENT METHOD Linear Statics Volume 1 : The Basis and Solids Eugenio Oñate The two volumes of this book cover most of the theoretical and computational aspects of the linear static analysis of structures with the Finite Element Method (FEM). The content of the book is based on the lecture notes of a basic course on Structural Analysis with the FEM taught by the author at the Technical University of Catalonia (UPC) in Barcelona, Spain for the last 30 years. Volume1 presents the basis of the FEM for structural analysis and a detailed description of the finite element formulation for axially loaded bars, plane elasticity problems, axisymmetric solids and general three dimensional solids. Each chapter describes the background theory for each structural model considered, details of the finite element formulation and guidelines for the application to structural engineering problems. The book includes a chapter on miscellaneous topics such as treatment of inclined supports, elastic foundations, stress smoothing, error estimation and adaptive mesh refinement techniques, among others. The text concludes with a chapter on the mesh generation and visualization of FEM results. The book will be useful for students approaching the finite element analysis of structures for the first time, as well as for practising engineers interested in the details of the formulation and performance of the different finite elements for practical structural analysis. STRUCTURAL ANALYSIS WITH THE FINITE ELEMENT METHOD Linear Statics Volume 2: Beams, Plates and Shells Eugenio Oñate The two volumes of this book cover most of the theoretical and computational aspects of the linear static analysis of structures with the Finite Element Method (FEM).The content of the book is based on the lecture notes of a basic course on Structural Analysis with the FEM taught by the author at the Technical University of Catalonia (UPC) in Barcelona, Spain for the last 30 years. Volume 2 presents a detailed description of the finite element formulation for analysis of slender and thick beams, thin and thick plates, folded plate structures, axisymmetric shells, general curved shells, prismatic structures and three dimensional beams. Each chapter describes the background theory for each structural model considered, details of the finite element formulation and guidelines for the application to structural engineering problems Emphasis is put on the treatment of structures with layered composite materials. The book will be useful for students approaching the finite element analysis of beam, plate and shell structures for the first time, as well as for practising engineers interested in the details of the formulation and performance of the different finite elements for practical structural analysis.**

COMPUTING NEWSLETTER FOR SCHOOLS OF BUSINESS

DESIGN THEORY AND METHODS USING CAD/CAE

THE COMPUTER AIDED ENGINEERING DESIGN SERIES

Academic Press **The fourth book of a four-part series, Design Theory and Methods using CAD/CAE integrates discussion of modern engineering design principles, advanced design tools, and industrial design practices throughout the design process. This is the first book to integrate discussion of computer design tools throughout the design process. Through this book series, the reader will: Understand basic design principles and all digital modern engineering design paradigms Understand CAD/CAE/CAM tools available for various design related tasks Understand how to put an integrated system together to conduct All Digital Design (ADD) product design using the paradigms and tools Understand industrial practices in employing ADD virtual engineering design and tools for product development The first book to integrate discussion of computer design tools throughout the design process Demonstrates how to define a meaningful design problem and conduct systematic design using computer-based tools that will lead to a better, improved design Fosters confidence and competency to compete in industry, especially in high-tech companies and design departments**

USING R FOR NUMERICAL ANALYSIS IN SCIENCE AND ENGINEERING

CRC Press **Instead of presenting the standard theoretical treatments that underlie the various numerical methods used by scientists and engineers, Using R for Numerical Analysis in Science and Engineering shows how to use R and its add-on packages to obtain numerical solutions to the complex mathematical problems commonly faced by scientists and engineers. This practical guide to the capabilities of R demonstrates Monte Carlo, stochastic, deterministic, and other numerical methods through an abundance of worked examples and code, covering the solution of systems of linear algebraic equations and nonlinear equations as well as ordinary differential equations and partial differential equations. It not only shows how to use R's powerful graphic tools to construct the types of plots most useful in scientific and engineering work, but also: Explains how to statistically analyze and fit data to linear and nonlinear models Explores numerical differentiation, integration, and optimization Describes how to find eigenvalues and eigenfunctions Discusses interpolation and curve fitting Considers the analysis of time series Using R for Numerical Analysis in Science and Engineering provides a solid introduction to the most useful numerical methods for scientific and engineering data analysis using R.**

MACHINE LEARNING IN PYTHON

ESSENTIAL TECHNIQUES FOR PREDICTIVE ANALYSIS

John Wiley & Sons **Learn a simpler and more effective way to analyze data andpredict outcomes with Python Machine Learning in Python shows you how to successfullyanalyze data using only two core machine learning algorithms, andhow to apply them using Python. By focusing on two algorithmfamilies that effectively predict outcomes, this book is able toprovide full descriptions of the mechanisms at work, and theexamples that illustrate the machinery with specific, hackablecode. The algorithms are explained in simple terms with no complexmath and applied using Python, with guidance on algorithmselection, data preparation, and using the trained models inpractice. You will learn a core set of Python programmingtechniques, various methods of building predictive models, and howto measure the performance of each model to ensure that the rightone is used. The chapters on penalized linear regression andensemble methods dive deep into each of the algorithms, and you canuse the sample code in the book to develop your own data analysissolutions. Machine learning algorithms are at the core of data analyticsand visualization. In the past, these methods required a deepbackground in math and statistics, often in combination with thespecialized R programming language. This book demonstrates howmachine learning can be implemented using the more widely used andaccessible Python programming language. Predict outcomes using linear and ensemble algorithmfamilies Build predictive models that solve a range of simple andcomplex problems Apply core machine learning algorithms using Python Use sample code directly to build custom solutions Machine learning doesn't have to be complex and highlyspecialized. Python makes this technology more accessible to a muchwider audience, using methods that are simpler, effective, and welltested. Machine Learning in Python shows you how to do this,without requiring an extensive background in math orstatistics.**

STATISTICAL PROGRAMMING WITH SAS/IML SOFTWARE

SAS Institute **Annotation SAS/IML software is a powerful tool for data analysts because it enables implementation of statistical algorithms that are not available in any SAS procedure. Rick Wicklin's Statistical Programming with SAS/IML Software is the first book to provide a comprehensive description of the software and how to use it. He presents tips and techniques that enable you to use the IML procedure and the SAS/IML Studio application efficiently. In addition to providing a comprehensive introduction to the software, the book also shows how to create and modify statistical graphs, call SAS procedures and R functions from a SAS/IML program, and implement such modern statistical techniques as simulations and bootstrap methods in the SAS/IML language. Written for data analysts working in all industries, graduate students, and consultants, Statistical Programming with SAS/IML Software includes numerous code snippets and more than 100 graphs.**

FINITE ELEMENTS FOR ENGINEERS WITH ANSYS APPLICATIONS

Cambridge University Press **Covering theory and practical industry usage of the finite element method, this highly-illustrated step-by-step approach thoroughly introduces methods using ANSYS.**

LOCATING LINES AND HYPERPLANES

THEORY AND ALGORITHMS

Springer Science & Business Media **Line and hyperplane location problems play an important role not only in operations research and location theory, but also in computational geometry and robust statistics. This book provides a survey on line and hyperplane location combining analytical and geometrical methods. The major portion of the text presents new results on this topic, including the extension of some special cases to all distances derived from norms and a discussion of restricted problems in the plane. Almost all results are proven in the text and most of them are illustrated by examples. Furthermore, relations to classical facility location and to problems in computational geometry are pointed out. Audience: The book is suitable for researchers, lecturers, and graduate students working in the fields of location theory or computational geometry.**

FUNDAMENTALS AND LINEAR ALGEBRA FOR THE CHEMICAL ENGINEER

SOLVING NUMERICAL PROBLEMS

John Wiley & Sons **A practical engineer's companion to using numerical methods for the solution of complex mathematical problems. It thus enables readers to use and implement standard numerical tools in their work, explaining the theory behind the various functions and problem solvers, while showcasing applications in diverse scientific and engineering fields. The material is based on several tried-and-tested courses for scientists and engineers taught by the authors, and all the exercises and problems are classroom-tested. The required software is freeware developed and maintained by the authors, included on the accompanying CD-ROM, together with an installation tutorial, all the examples and sample codes described in the book, as well as a host of additional examples.**

QUANTITATIVE METHODS FOR MANAGERIAL DECISIONS

Addison Wesley Publishing Company

OPTIMIZATION THEORY

Springer Science & Business Media **This volume provides a comprehensive introduction to the theory of (deterministic) optimization. It covers both continuous and discrete optimization. This allows readers to study problems under different points-of-view, which supports a better understanding of the entire field. Many exercises are included to increase the reader's understanding.**

APPLIED DISCRETE STRUCTURES

New Age International **Although This Book Is Intended As A Sequel To Foundations Of Discrete Mathematics By The Same Author, It Can Be Read Independently Of The Latter, As The Relevant Background Needed Has Been Reviewed In Chapter 1. The Subsequent Chapters Deal With Graph Theory (With Applications), Analysis Of Algorithms (With A Detailed Study Of A Few Sorting Algorithms And A Discussion Of Tractability), Linear Programming (With Applications, Variations, Karmarkars Polynomial Time Algorithm, Integer And Quadratic Programming), Applications Of Algebra (To Polyas Theory Of Counting, Galois Theory, Coding Theory Of Designs). A Chapter On Matroids Familiarises The Reader With This Relatively New Branch Of Discrete Mathematics.Even Though Some Of The Topics Are Relatively Advanced, An Attempt Has Been Made To Keep The Style Elementary, So That A Sincere Student Can Read The Book On His Own. A Large Number Of Comments, Exercises, And References Is Included To Broaden The Readers Scope Of Vision. A Detailed Index Is Provided For Easy Reference.**

TECHNOLOGICAL CONCEPTS AND MATHEMATICAL MODELS IN THE EVOLUTION OF MODERN ENGINEERING SYSTEMS

CONTROLLING • MANAGING • ORGANIZING

Springer Science & Business Media **This collection of historical research studies covers the evolution of technology as knowledge, the emergence of an autonomous engineering science in the Industrial Age, the idea of scientific managment of production and operation systems, and the interaction between mathematical models and technological concepts. The book is published with the support of the UNESCO Venice Office - Regional Office for Science & Technology in Europe as an activity of the Project: The evolution of events, concepts and models in engineering systems.**

MATLAB

A PRACTICAL INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING

Butterworth-Heinemann **MatLab, Third Edition is the only book that gives a full introduction to programming in MATLAB combined with an explanation of the software's powerful functions, enabling engineers to fully exploit its extensive capabilities in solving engineering problems. The book provides a systematic, step-by-step approach, building on concepts throughout the text, facilitating easier learning. Sections on common pitfalls and programming guidelines direct students towards best practice. The book is organized into 14 chapters, starting with programming concepts such as variables, assignments, input/output, and selection statements; moves onto loops; and then solves problems using both the 'programming concept' and the 'power of MATLAB' side-by-side. In-depth coverage is given to input/output, a topic that is fundamental to many engineering applications. Vectorized Code has been made into its own chapter, in order to emphasize the importance of using MATLAB efficiently. There are also expanded examples on low-level file input functions, Graphical User Interfaces, and use of MATLAB Version R2012b; modified and new end-of-chapter exercises; improved labeling of plots; and improved standards for variable names and documentation. This book will be a valuable resource for engineers learning to program and model in MATLAB, as well as for undergraduates in engineering and science taking a course that uses (or recommends) MATLAB. Presents programming concepts and MATLAB built-in functions side-by-side Systematic, step-by-step approach, building on concepts throughout the book, facilitating easier learning Sections on common pitfalls and programming guidelines direct students towards best practice**

FUNDAMENTALS OF NATURAL COMPUTING

BASIC CONCEPTS, ALGORITHMS, AND APPLICATIONS

CRC Press **Natural computing brings together nature and computing to develop new computational tools for problem solving; to synthesize natural patterns and behaviors in computers; and to potentially design novel types of computers. Fundamentals of Natural Computing: Basic Concepts, Algorithms, and Applications presents a wide-ranging survey of novel techniques and important applications of nature-based computing. This book presents theoretical and philosophical discussions, pseudocodes for algorithms, and computing paradigms that illustrate how computational techniques can be used to solve complex problems, simulate nature, explain natural phenomena, and possibly allow the development of new computing technologies. The author features a consistent and approachable, textbook-style format that includes lucid figures, tables, real-world examples, and different types of exercises that complement the concepts while encouraging readers to apply the computational tools in each chapter. Building progressively upon core concepts of nature-inspired techniques, the topics include evolutionary computing, neurocomputing, swarm intelligence, immunocomputing, fractal geometry, artificial life, quantum computing, and DNA computing. Fundamentals of Natural Computing is a self-contained introduction and a practical guide to nature-based computational approaches that will find numerous applications in a variety of growing fields including engineering, computer science, biological modeling, and bioinformatics.**

FOREST MANAGEMENT AND PLANNING

Academic Press **Forest Management and Planning provides a focused understanding of contemporary forest management issues through real life examples to engage students. The methodology for the development of quantitatively-derived forest management plans – from gathering information to the implementation of plans at the forest level – are clearly explained. Emphasis is placed on the development of traditional commodity production forest plans using linear programming, the development of alternative forest plans, and problem resolution in planning. The authors have developed this book based on their personal experience in teaching forest management courses and the review of ten forestry programs (Auburn University, University of Georgia, Iowa State University, Louisiana State University, Northern Arizona University, Ohio State University, Pennsylvania State University, University of Florida, Virginia Tech, and Oregon State University). The integration of extended case studies of a variety of scenarios as well as the inclusion of a section on report writing will engage students. Acknowledgement and integration of various software packages for forest management provide the most useful tools for those studying forest management and distinguish this book from the competition. This book is an ideal resource for students of Forest Management – primarily an upper-level course in forestry, and natural resource management, wildlife, and recreation programs. Real-life examples illustrated mathematically and graphically End-of-chapter questions Modern coverage of the planning and management of US Forest timber production Case study analysis Expansive applications drawn for examples in the western US, the Lake States, the northeastern US, the southern US and Canada Detailed descriptions of models and solution methods for integrating a variety of wildlife habitat constraints**

TACTICAL WIRELESS COMMUNICATIONS AND NETWORKS

DESIGN CONCEPTS AND CHALLENGES

John Wiley & Sons **Providing a complete description of modern tactical military communications and networks technology, this book systematically compares tactical military communications techniques with their commercial equivalents, pointing out similarities and differences. In particular it examines each layer of the protocol stack and shows how specific tactical and security requirements result in changes from the commercial approach. The author systematically leads readers through this complex topic, firstly providing background on the architectural approach upon which the analysis will be based, and then going into detail on tactical wireless communications and networking technologies and techniques. Structured progressively: for readers needing an overall view; for those looking at the communications aspects (lower layers of the protocol stack); and for users interested in the networking aspects (higher layers of the protocol stack) Presents approaches to alleviate the challenges faced by the engineers in the field today Furnished throughout with illustrations and case studies to clarify the notional and architectural approaches Includes a list of problems for each chapter to emphasize the important aspects of the topics covered Covers the current state of tactical networking as well as the future long term evolution of tactical wireless communications and networking in the next 50 years Written at an advanced level with scope as a reference tool for engineers and scientists as well as a graduate text for advanced courses**

TEMPORAL LOGIC AND STATE SYSTEMS

Springer Science & Business Media **Temporal logic has developed over the last 30 years into a powerful formal setting for the specification and verification of state-based systems. Based on university lectures given by the authors, this book is a comprehensive, concise, uniform, up-to-date presentation of the theory and applications of linear and branching time temporal logic; TLA (Temporal Logic of Actions); automata theoretical connections; model checking; and related theories. All theoretical details and numerous application examples are elaborated carefully and with full formal rigor, and the book will serve as a basic source and reference for lecturers, graduate students and researchers.**

ELEMENTARY LINEAR PROGRAMMING WITH APPLICATIONS

Elsevier **Elementary Linear Programming with Applications presents a survey of the basic ideas in linear programming and related areas. It also provides students with some of the tools used in solving difficult problems which will prove useful in their professional career. The text is comprised of six chapters. The Prologue gives a brief survey of operations research and discusses the different steps in solving an operations research problem. Chapter 0 gives a quick review of the necessary linear algebra. Chapter 1 deals with the basic necessary geometric ideas in Rn. Chapter 2 introduces linear programming with examples of the problems to be considered, and presents the simplex method as an algorithm for solving linear programming problems. Chapter 3 covers further topics in linear programming, including duality theory and sensitivity analysis. Chapter 4 presents an introduction to integer programming. Chapter 5 covers a few of the more important topics in network flows. Students of business, engineering, computer science, and mathematics will find the book very useful.**

THE NATURE OF PRICE THEORY

Introduces the concepts and relationships of the price theory. Refers to the origins of the ideas, especially Alfred Marshall's basic methods of linear programming and Schumpeter's theory of economic development.

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Cengage Learning Market-leading FINITE MATHEMATICS FOR THE MANAGERIAL, LIFE, AND SOCIAL SCIENCES, Eleventh Edition balances modern applications, solid pedagogy, and the latest technology to provide students the context they need to stay motivated in the course and interested in the material. Suitable for majors and non-majors alike, the text uses an intuitive approach that teaches concepts through examples drawn from real-life—particularly from students' fields of interest. In addition, insightful Portfolios highlight the careers of real people and discuss how they incorporate math into their daily professional activities. Numerous exercises ensure that students have a concrete understanding of concepts before advancing to the next topic. The text's pedagogical features coupled with an exciting array of supplements equip students with the tools they need to make the most of their study time and to succeed in the course. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

HANDBOOK OF SEMIDEFINITE PROGRAMMING

THEORY, ALGORITHMS, AND APPLICATIONS

Springer Science & Business Media This handbook offers a broad, advanced overview of the current state of Semidefinite Programming, in nineteen chapters written by the leading experts on the subject. The material is organized in three parts: Theory, Algorithms, and Applications and Extensions.

COMBINATORICS AND GRAPH THEORY

PHI Learning Pvt. Ltd. Combinatorics and Graph Theory is designed as a textbook for undergraduate students of computer science and engineering and postgraduate students of computer applications. The book seeks to introduce students to the mathematical concepts needed to develop abstract thinking and problem solving—important prerequisites for the study of computer science. The book provides an exhaustive coverage of various concepts and remarkable introduction of several topics of combinatorics and graph theory. The book presents an informative exposure for beginners and acts as a reference for advanced students. It highlights comprehensive and rigorous views of combinatorics and graphs. The text shows simplicity and step-by-step concepts throughout and is profusely illustrated with diagrams. The real-world applications corresponding to the topics are appropriately highlighted. The chapters have also been interspersed throughout with numerous interesting and instructional notes. Written in a lucid style, the book helps students apply the mathematical tools to computer-related concepts and consists of around 600 worked-out examples which motivate students as a self-learning mode.KEY FEATURES Contains various exercises with their answers or hints. Lays emphasis on the applicability of mathematical structures to computer science. Includes competitive examinations' questions asked in GATE, NET, SET, etc