Optimal Control Theory And Static Optimization In Economics Hardcover

Mathematical Optimization and Economic TheoryOptimization in Economics and FinanceOptimization in Economic TheoryMathematical Optimization and Economic AnalysisElements of OptimizationOptimisation in Economic AnalysisAn Explanation of Constrained Optimization for EconomistsOptimization in Economics and FinanceOptimal Control Theory and Static Optimization in EconomicsMathematical Analysis and Optimization for EconomistsDynamic Optimization and Mathematical EconomicsApproximation, Optimization and Mathematical EconomicsElements of Dynamic OptimizationCalculus and Techniques of Optimization with Microeconomic ApplicationsDynamic OptimizationIntroductory Optimization DynamicsNatural Resource EconomicsMathematics for Stability and Optimization of Economic SystemsComputational EconomicsFunctional Analysis, Optimization, and Mathematical Economics Michael D. Intriligator Bruce D. Craven Avinash K. Dixit Mikuláš Luptáčik Delia Koo Gordon Mills Peter B. Morgan Bruce Desmond Craven Daniel Léonard Michael J. Panik Pan-Tai Liu Marc Lassonde Alpha C. Chiang John Hoag Morton I. Kamien P.N.V. Tu Jon M. Conrad Yasuo Murata Gerald L. Thompson Leonid Vitalyevich Kantorovich

Mathematical Optimization and Economic Theory Optimization in Economics and Finance Optimization in Economic Theory Mathematical Optimization and Economic Analysis Elements of Optimization Optimisation in Economic Analysis An Explanation of Constrained Optimization for Economists Optimization in Economics and Finance Optimal Control Theory and Static Optimization in Economics Mathematical Analysis and Optimization for Economists Dynamic Optimization and Mathematical Economics Approximation, Optimization and Mathematical Economics Elements of Dynamic Optimization Calculus and Techniques of Optimization with Microeconomic Applications Dynamic Optimization Introductory Optimization Dynamics Natural Resource Economics Mathematics for Stability and Optimization of Economic Systems Computational Economics Functional Analysis, Optimization, and Mathematical Economics Michael D. Intriligator Bruce D. Craven Avinash K. Dixit Mikuláš Luptáčik Delia Koo Gordon Mills Peter B. Morgan Bruce Desmond Craven Daniel Léonard Michael J. Panik Pan-Tai Liu Marc Lassonde Alpha C. Chiang John Hoag Morton I. Kamien P.N.V. Tu Jon M. Conrad Yasuo Murata Gerald L. Thompson Leonid Vitalyevich Kantorovich

a classic account of mathematical programming and control techniques and their applications to static and dynamic problems in economics

extends the optimization techniques in a form that may be adopted for modeling social choice problems the models in this book provide possible models for a society s social choice for an allocation that maximizes welfare and utilization of resources a computer program scom is presented here for computing social choice models by optimal control

a new edition of a student text which provides a broad study of optimization methods it builds on the base of simple economic theory elementary linear algebra and calculus and reinforces each new mathematical idea by relating it to its economic application

mathematical optimization and economic analysis is a self contained introduction to various optimization techniques used in economic modeling and analysis such as geometric linear and convex programming and data envelopment analysis through a systematic approach this book demonstrates the usefulness of these mathematical tools in quantitative and qualitative economic analysis the book presents specific examples to demonstrate each technique s advantages and applicability as well as numerous applications of these techniques to industrial economics regulatory economics trade policy economic sustainability production planning and environmental policy key features include a detailed presentation of both single objective and multiobjective optimization an in depth exposition of various applied optimization problems implementation of optimization tools to improve the accuracy

of various economic models extensive resources suggested for further reading this book is intended for graduate and postgraduate students studying quantitative economics as well as economics researchers and applied mathematicians requirements include a basic knowledge of calculus and linear algebra and a familiarity with economic modeling

this book attempts to present the concepts which underlie the various optimization procedures which are commonly used it is written primarily for those scientists such as economists operations researchers and en gineers whose main tools of analysis involve optimization techniques and who possess a not very sharp knowledge of one or one and a half year s calculus through partial differentiation and taylor s theorem and some acquaintance with elementary vector and matrix terminology such a scientist is frequently confronted with expressions such as lagrange multi pliers first and second order conditions linear programming and activity analysis duality the kuhn tucker conditions and more recently dy namic programming and optimal control he or she uses or needs to use these optimization techniques and would like to feel more comfortable with them through better understanding of their underlying mathematical concepts but has no immediate use for a formal theorem proof treatment which quickly abstracts to a general case of n variables and uses a style and terminology that are discouraging to people who are not mathematics majors the emphasis of this book is on clarity and plausibility through examples which are worked out step by step in detail i hope to illustrate some tools which will be useful to scientists when they apply optimization techniques to their problems most of the chapters may be read independently of each other with the exception of chapter 6 which depends on chapter 5 for instance the reader will find little or no difficulty in reading chapter 8 without having read the previous chapters

one of the fundamental economic problems is one of making the best use of limited resources as a result mathematical optimisation methods play a crucial role in economic theory covering the use of such methods in applied and policy contexts this book deals not only with the main techniques linear programming nonlinear optimisation and dynamic programming but also emphasizes the art of model building and discusses fields such as optimisation over time

peter b morgan s explanation of constrained optimization for economists is an accessible user friendly guide that provides explanations both written and visual of the manner in which many constrained optimization problems can be solved

many optimization questions arise in economics and finance an important example of this is the society s choice of the optimum state of the economy the social choice problem this book the usual optimization techniques in a form that may be adopted for modeling social choice problems problems discussed include when is an optimum reached when is it unique relaxation of the conventional convex or concave assumptions on an economic model associated mathematical concepts such as invex and quasimax multiobjective optimal control models and related computational methods and programs these techniques are applied to economic growth models including small stochastic perturbations finance and financial investment models and the interaction between financial and production variables modeling sustainability over long time horizons boundary transversality conditions and models with several conflicting objectives although the applications are general and illustrative the models in this book provide examples of possible models for a society s social choice for an allocation that maximizes welfare and utilization of resources as well as using existing computer programs for optimization of models a new computer program named scom is presented in this book for computing social choice models by optimal control

optimal control theory is a technique being used increasingly by academic economists to study problems involving optimal decisions in a multi period framework this textbook is designed to make the difficult subject of optimal control theory easily accessible to economists while at the same time maintaining rigour economic intuitions are emphasized and examples and problem sets covering a wide range of applications in economics are provided to assist in the learning process theorems are clearly stated and their proofs are carefully explained the development of the text is gradual and fully integrated beginning with simple formulations and progressing to advanced topics such as control parameters jumps in state variables and bounded state space for greater economy and elegance optimal control theory is introduced directly without recourse to the calculus of variations the connection with the latter and with dynamic programming is explained in a separate chapter a second purpose of the book is to draw

the parallel between optimal control theory and static optimization chapter 1 provides an extensive treatment of constrained and unconstrained maximization with emphasis on economic insight and applications starting from basic concepts it derives and explains important results including the envelope theorem and the method of comparative statics this chapter may be used for a course in static optimization the book is largely self contained no previous knowledge of differential equations is required

in mathematical analysis and optimization for economists the author aims to introduce students of economics to the power and versatility of traditional as well as contemporary methodologies in mathematics and optimization theory and illustrates how these techniques can be applied in solving microeconomic problems this book combines the areas of intermediate to advanced mathematics optimization and microeconomic decision making and is suitable for advanced undergraduates and first year graduate students this text is highly readable with all concepts fully defined and contains numerous detailed example problems in both mathematics and microeconomic applications each section contains some standard as well as more thoughtful and challenging exercises solutions can be downloaded from the crc press website all solutions are detailed and complete features contains a whole spectrum of modern applicable mathematical techniques many of which are not found in other books of this type comprehensive and contains numerous and detailed example problems in both mathematics and economic analysis suitable for economists and economics students with only a minimal mathematical background classroom tested over the years when the author was actively teaching at the university of hartford serves as a beginner text in optimization for applied mathematics students accompanied by several electronic chapters on linear algebra and matrix theory nonsmooth optimization economic efficiency and distance functions available for free on routledge com 9780367759018

as an outgrowth of the advancement in modern control theory during the past 20 years dynamic modeling and analysis of economic systems has become an important subject in the study of economic theory recent developments in dynamic utility economic planning and profit optimiza tion for example have been greatly influenced by results in optimal control stabilization estimation optimization under conflicts multi criteria optimization control of large scale systems etc the great success that has been achieved so far in utilizing modern control theory in economic systems should be attributed to the effort of control theorists as well as economists collaboration between the two groups of researchers has proven to be most successful in many instances nevertheless the gap between them has existed for some time whereas a control theorist frequently sets up a mathematically feasible model to obtain results that permit economic interpretations an economist is concerned more with the fidelity of the model in representing a real world problem and results that are obtained through possibly less mathematical analysis are due largely to economic insight the papers appearing in this volume are divided into three parts in part i there are five papers on the application of control theory to economic planning part ii contains five papers on exploration exploita tion and pricing of extractive natural resources finally in part iii some recent advances in large scale systems and decentralized control appear

the articles in this proceedings volume reflect the current trends in the theory of approximation optimization and mathematical economics and include numerous applications the book will be of interest to researchers and graduate students involved in functional analysis approximation theory mathematical programming and optimization game theory mathematical finance and economics

designed to be used with chiang s fundamental methods of mathematical economics or independently at advanced undergraduate or graduate level this text presents an in depth exploration of dynamic optimization in economics

this textbook is designed as a guide for students of mathematical economics with the aim of providing them with a firm foundation for further studies in economics a substantial portion of the mathematical tools required for the study of microeconomics at the graduate level is covered in addition to the standard elements of microeconomics and various applications theorems and definitions are clearly explained with numerous exercises to complement the text and to help the student better understand and master the principles of mathematical economics

an excellent financial research tool this celebrated classic focuses on the methods of solving continuous time problems the two part treatment covers the calculus of variations and optimal control in the decades since its

initial publication this text has defined dynamic optimization courses taught to economics and management science students 1998 edition

optimal control theory has been increasingly used in economi and management science in the last fifteen years or so it is now commonplace even at textbook level it has been applied to a great many areas of economics and management science such as optimal growth optimal population pollution control natural resources bioeconomics education international trade monopoly oligopoly and duopoly urban and regional economics arms race control business finance inventory planning marketing maintenance and replacement policy and many others it is a powerful tool of dynamic optimization there is no doubt social sciences students should be familiar with this tool if not for their own research at least for reading the literature these lecture notes attempt to provide a plain exposition of optimal control theory with a number of economic examples and applications designed mainly to illustrate the various techniques and point out the wide range of possible applications rather than to treat exhaustively any area of economic theory or policy chapters 2 3 and 4 are devoted to the calculus of variations chapter 5 develops optimal control theory from the variational approach chapter 6 deals with the problems of constrained state and control variables chapter 7 with linear control models and chapter 8 with stabilization models discrete systems are discussed in chapter 9 and sensitivity analysis in chapter 10 chapter 11 presents a wide range of economics and management science applications

in this book jon conrad and colin clark develop the theory of resource economics

economic theory and mathematical economics mathematics for stability and optimization of economic systems provides information pertinent to the stability aspects and optimization methods relevant to various economic systems this book presents relevant mathematical theorems sufficient to develop important economic systems including leontief input output systems keynesian dynamic models the ramsey optimal accumulation systems and von neumann expanding economic systems organized into two parts encompassing nine chapters this book begins with an overview of useful theorems on matrices eigenvalue problems and matrices with dominant diagonals and p matrices this text then explores the linear transformations on vector spaces other chapters consider the hawkins simon theorem concerning non negative linear systems this book discusses as well the dual linear relations and optimization methods applicable to inequality economic systems the final chapter deals with powerful optimal control method for dynamical systems this book is a valuable resource for mathematicians economists research workers and graduate students

this is a collection of papers on the work of leonid kantorovich a russian mathematician and economist and a leading contributor to the fields of optimization and mathematical economics kantorovich invented linear programming then applied this theory to optimal macroeconomic planning in a socialist economy for which he received the nobel prize the book is dedicated to the memory of kantorovich who died in 1986 it contains original contributions from several researchers in the ussr never before available in the u s it is organized in a logical sequence from mathematics to the applications of the theories to concrete problems the work is fully illustrated

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