

Mathematical Economics Lecture Notes

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 Lecture notes in economics and mathematical systems

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Theory of the Price Index Springer Science & Business Media

An approach to the modeling of and the reasoning under uncertainty. The book develops the Dempster-Shafer Theory with regard to the reliability of reasoning with uncertain arguments. Of particular interest here is the development of a new synthesis and the integration of logic and probability theory. The reader benefits from a new approach to uncertainty modeling which extends classical probability theory.

Essays in Honor of Oskar Morgenstern Springer Science & Business Media

The role of asymmetric information in allocation of resources, together with the associated information-revelation process, has long been a central focus of economic research. While the bulk of the literature addresses these issues within the framework of principal-agent relationship, which essentially reduces the problem to the sole principal's (the sole Stackelberg leader's) optimization problem subject to the agents' (the Stackelberg followers') responses, there are

recent attempts to extend analysis to other economic setups characterized by different relationships among decision-makers. A notable strand of such attempts is the core analysis of incomplete information. Here, there is no Stackelberg-type relationship, and more importantly the players can talk to each other for coordinated choice of strategies. See, e.g., Wilson (1978) for a pioneering work; Yannelis (1991) for formulation of feasibility of a strategy as its measurability; Ichiishi and Idzik (1996) for introduction of Bayesian incentive-compatibility to this strand; Ichiishi, Idzik and Zhao (1994) for information revelation (that is, endogenous determination of updated information structures); Ichiishi and Radner (1997) and Ichiishi and Sertel (1998) for studies of a specific model of Chandler's firm in multidivisional form for sharper results; and Vohra (1999) for a recent work. It is a common postulate in these works that every player takes part in design of a mechanism and also in execution of the signed contract.

Refutable Theories of Value Springer Science & Business Media

On February 20, 1978, the Department of Econometrics of the University of Tilburg organized a symposium on Convex Analysis and Mathematical Economics to commemorate the 50 anniversary of the University. The general theme of the anniversary celebration was "innovation"

and since an important part of the departments' theoretical work is concentrated on mathematical economics, the above mentioned theme was chosen. The scientific part of the Symposium consisted of four lectures, three of them are included in an adapted form in this volume, the fourth lecture was a mathematical one with the title "On the development of the application of convexity". The three papers included concern recent developments in the relations between convex analysis and mathematical economics. Dr. P.H.M. Ruys and Dr. H.N. Weddepohl (University of Tilburg) study in their paper "Economic theory and duality", the relations between optimality and equilibrium concepts in economic theory and various duality concepts in convex analysis. The models are introduced with an individual facing a decision in an optimization problem. Next, an individual person decision problem is analyzed, and the following concepts are defined: optimum, relative optimum, Nash-equilibrium, and Pareto-optimum.

A New Didactic Approach Cambridge University Press

The complexity of distribution systems is augmented by various trends: globalization of the manufacturing industry, rising customer demands, and the reverse flows within closed-loop systems. In this light, the need for 'advanced' planning methods that are based on quantitative

optimization is constantly increasing. This book takes up the challenges posed by these developments. In doing so, it presents recent results and case studies from a group of researchers that regularly meet at the IWDL (International Workshop on Distribution Logistics). The text covers the design of distribution networks, vehicle routing, warehousing and reverse logistics. It also contains a comprehensive review of more than 60 case studies in reverse logistics.
Springer Science & Business Media

The book analyzes how modern portfolio theory and dynamic term structure models can be applied to government bond portfolio optimization problems. The author studies the necessary adjustments, examines the models with regard to the plausibility of their results and compares the outcomes to portfolio selection techniques used by practitioners. Both single-period and continuous-time bond portfolio optimization problems are considered.
Network Optimization Springer Science & Business Media

Over the last decades, technological progress has brought about a multitude of standardization problems. For instance, compatibility standards ensure the interoperability of goods, which is of decisive importance when users face positive externalities in consumption. Consumers' expectations are key to the problem of whether a new technology will prevail as de-facto standard or not. Early adopters must be confident that the network good will be successful. Thus, it may be worthwhile for firms to influence consumers' expectations. Consisting of three models on various aspects of standardization and expectations, this book aims at deepening our understanding of how standards and expectations interact. The models are applied to problems such as "Inter-Technology vs. Intra-Technology Competition" and "Standardization of Nascent Technologies".
Interaction and Market Structure Springer Science & Business Media

A number of different problems of interest to the operational researcher and the mathematical economist - for example, certain problems of optimization on graphs and networks, of machine-scheduling, of convex analysis and of approximation theory - can be formulated in a convenient way using the algebraic structure $(R, \$, @)$ where we may think of R as the (extended) real-number system with the binary combining operations $x\$y$, $x@y$ defined to be $\max(x,y)$, $(x+y)$ respectively. The use of this algebraic structure gives these problems the character of problems of linear algebra, or linear operator theory. This fact has been independently discovered by a number of people working in various fields and in different notations, and the starting-point for the present Lecture Notes was the writer's persuasion that the time had arrived to present a unified account of the algebra of linear transformations of spaces of n -tuples over $(R, \$, @)$, to demonstrate its relevance to operational research and to give solutions to the standard linear-algebraic problems which arise - e.g. the solution of linear equations exactly or approximately, the eigenvector eigenvalue problem and so on. Some of this material contains results of hitherto unpublished research carried out by the writer during the years 1970-1977.

Lecture Notes in Economics and Mathematical Systems Springer Science & Business Media
Network optimization is important in the modeling of problems and processes from such fields as engineering, computer science, operations research, transportation, telecommunication, decision support systems, manufacturing, and airline scheduling. Recent advances in data structures, computer technology, and algorithm development have made it possible to solve classes of network optimization problems that until recently were intractable. The refereed papers in this volume reflect the interdisciplinary efforts of a large group of scientists from academia and industry to model and solve complicated large-scale network optimization problems.

Mathematical Models for Evacuation Planning in Urban Areas Springer Science & Business Media
Lecture Notes on Introduction to Mathematical Economics
Lecture Notes in Operations Research and Mathematical Economics
Lecture notes on introduction to mathematical economics
Montréal : Librairie de l'Université de Montréal
Minimax Algebra Springer Science & Business Media
Extreme Games and Their Solutions Springer Science & Business Media

It has been 20 years since the last edition of this classic text. Kevin Wainwright, a long time user of

the text (British Columbia University and Simon Fraser University), has executed the perfect revision—he has updated examples, applications and theory without changing the elegant, precise presentation style of Alpha Chiang.

Bond Portfolio Optimization Montréal : Librairie de l'Université de Montréal

New Tools of Economic Dynamics gives an introduction and overview of recently developed methods and tools, most of them developed outside economics, to deal with the qualitative analysis of economic dynamics. It reports the results of a three-year research project by a European and Latin American network on the intersection of economics with mathematical, statistical, and computational methods and techniques. Focusing upon the evolution and manifold structure of complex dynamic phenomena, the book reviews and shows applications of a variety of tools, such as symbolic and coded dynamics, interacting agents models, microsimulation in econometrics, large-scale system analysis, and dynamical systems theory. It shows the potential of a comprehensive analysis of growth, fluctuations, and structural change along the lines indicated by pioneers like Harrod, Haavelmo, Hicks, Goodwin, Morishima, and it highlights the explanatory power of the qualitative approach they initiated.

Mathematics of Economics and Business Psychology Press

The focus of this book is on the management of inbound call centers. Based on technical performance measures this book develops economic performance measures for different classes of telephone service numbers. Both the numbers of agents and the number of offered phone lines are decision variables in the operational personnel planning process. Since call arrivals as well as call-handling times are random in inbound call centers, this book concentrates on performance analysis and optimization using queueing models. These models may differ with respect to several features, for example, the number of customer classes, the number of differently trained agent groups, the limitation of the waiting room, or the customer's impatience. This book describes mathematical methods and algorithms to relate these decision variables to technical as well as economic performance measures.

Advances in Mathematical Economics MIT Press

The authors have written a rigorous yet elementary and self-contained book to present, in a unified framework, generalized convex functions. The book also includes numerous exercises and two appendices which list the findings consulted.

Lecture Notes in Economics and Mathematical Systems Springer Science & Business Media

For all students who wish to understand current economic and business literature, knowledge of mathematical methods has become a prerequisite. Clear and concise, with precise definitions and theorems, Werner and Sotskov cover all the major topics required to gain a firm grounding in this subject including sequences, series, applications in finance, functions, differentiations, differentials and difference equations, optimizations with and without constraints, integrations and much more. Containing exercises and worked examples, precise definitions and theorems as well as economic applications, this book provides the reader with a comprehensive understanding of the mathematical models and tools used in both economics and business.

Mathematics for Economics Routledge

There is convergent consensus among scientists that many social, economic and financial phenomena can be described by a network of agents and their interactions. Surprisingly, even though the application fields are quite different, those networks often show a common behaviour. Thus, their topological properties can give useful insights on how the network is structured, which are the most "important" nodes/agents, how the network reacts to new arrivals. Moreover the network, once included into a dynamic context, helps to model many phenomena. Among the tools in which topology and dynamics are the essential tools, we will focus on the diffusion of technologies and fads, the rise of industrial districts, the evolution of financial markets, cooperation and competition, information flows, centrality and prestige. The volume, including recent

contributions to the field of network modelling, is based on the communications presented at NET 2006 (Verbania, Italy) and NET 2007 (Urbino, Italy); offers a wide range of recent advances, both theoretical and methodological, that will interest academics as well as practitioners. Theory and applications are nicely integrated: theoretical papers deal with graph theory, game theory, coalitions, dynamics, consumer behavior, segregation models and new contributions to the above mentioned area. The applications cover a wide range: airline transportation, financial markets, work team organization, labour and credit market.

A Mathematical Theory of Hints Springer Science & Business Media

Disasters like floods, hurricanes, chemical or nuclear accidents may cause the necessity to evacuate the affected area. The evacuation of the urban area needs to be planned carefully. One issue is the reorganization of the traffic routing. Congested urban areas have usually complex street networks that are composed of many intersections with streets connecting them. The population density of a congested urban area is usually high and the street network is already used to capacity during rush hour traffic. The considered problem of this work is the reorganization of the traffic routing of an urban area for the case of an emergency mass evacuation. Especially aspects of the evacuation like safety, avoidance of delays and the total system travel time are taken into account. Combinatorial and graph theoretical aspects are adapted for the evacuation problem and highlight issues concerning especially conflicts within intersections. This work gives an extensive summary of literature of evacuation of urban areas. Mixed-integer linear programming models are developed for evacuation problems and heuristic algorithms are provided and tested.?

Warsaw Fall Seminars in Mathematical Economics 1975 Springer Science & Business Media

This monograph presents a general equilibrium methodology for microeconomic policy analysis. It is intended to serve as an alternative to the now classical, axiomatic general equilibrium theory as expounded in Debreu's Theory of Value (1959) or Arrow and Hahn's General Competitive Analysis (1971). The monograph consists of several essays written over the last decade. It also contains an appendix by Charles Steinhorn on the elements of O -minimal structures.

Introduction to Stochastic Calculus for Finance Springer Science & Business Media

A concise, accessible introduction to maths for economics with lots of practical applications to help students learn in context.

An Approach to the Dempster-Shafer Theory of Evidence Springer

A textbook for a first-year PhD course in mathematics for economists and a reference for graduate students in economics.

Lecture Notes in Operations Research and Mathematical Economics Lecture Notes on Introduction to Mathematical Economics
Lecture Notes in Operations Research and Mathematical Economics
Lecture notes on introduction to mathematical economics

The International Summer School on Mathematical Systems Theory and Economics was held at the Villa Monastero in Varenna, Italy, from June 1 through June 12, 1967. The objective of this Summer School was to review the state of the art and the prospects for the application of the mathematical theory of systems to the study and the solution of economic problems. Particular emphasis was given to the use of the mathematical theory of control for the solution of problems in economics. It was felt that the publication of a volume collecting most of the lectures given at the school would show the current status of the application of these methods. The papers are organized into four sections arranged into two volumes: basic theories and optimal control of economic systems which appear in the first volume, and special mathematical problems and special applications which are contained in the second volume. Within each section the papers follow in alphabetical order by author. The seven papers on basic theories are a rather complete representative sample of the fundamentals of general systems theory, of the theory of dynamical systems and the theory of control. The five papers on the application of optimal control to economic systems present a broad spectrum of applications.