Operations Research Second Edition By Kalavathy

Operations Research (OR) began as an interdisciplinary activity to solve complex military problems during World War II. Utilizing principles from mathematics, engineering, business, computer science, economics, and statistics, OR has developed into a full fledged academic discipline with practical application in business, industry, government and military. Currently regarded as a body of established mathematical models and methods essential to solving complicated management issues, OR provides quantitative analysis of problems from which managers can make objective decisions. Operations Research and Management Science (OR/MS) methodologies continue to flourish in numerous decision making fields. Featuring a mix of international authors, Operations Research and Management Science Handbook combines OR/MS models, methods, and applications into one comprehensive, yet concise volume. The first resource to reach for when confronting OR/MS difficulties, this text – Provides a single source guide in OR/MS Bridges theory and practice Covers all topics relevant to OR/MS Offers a quick reference guide for students, researchers and practitioners Contains unified and up-to-date coverage designed and edited with non-experts in mind Discusses software availability for all OR/MS techniques Includes contributions from a mix of domestic and international experts The 26 chapters in the handbook are divided into two parts. Part I contains 14 chapters that cover the fundamental OR/MS models and methods. Each chapter gives an overview of a particular OR/MS model, its solution methods and illustrates successful applications. Part II of the handbook contains 11 chapters discussing the OR/MS applications in specific areas. They include airlines, e-commerce, energy systems, finance, military, production systems, project management, quality control, reliability, supply chain management and water resources. Part II ends with a chapter on the future of OR/MS applications.
This Book Contains The Papers Presented At The Workshop Oh Operational Research In Steel Industry, Organized At The Bhilai Steel Plant Of Steel Authority Of India Ltd., During March 5-6, 1990 In An Edited Form. The Workshop Was Organised By Operational Research Society Of India And Was Sponsored By Steel Authority Of India Ltd., And The Tata Iron And Steel Company Ltd.The Papers Are Based On The Studies Conducted By The Operational Researchers In Steel Plants And The Academicians, Almost All The Papers Address Real Life Problems Faced In The Steel Plants And To That Extent It Is One Of The Few Books Dealing With Application Of Operational Research, The Papers Cover The Entire Spectrum Of Steel Industry From The Mining Of Raw Materials, Through Operations Of Blast Furnaces, Steel Melting Shops, Mills To Despatch Of Finished Steel. The O.R. Tools Used Cover Mathematical Programming (Including Non-Linear Programming), Simulation. Decision Analysis, Statistical Analysis, Decision Support Systems Etc.
An Annotated Timeline of Operations Research: An Informal History recounts the evolution of Operations Research (OR) as a new science - the science of decision making. Arising from the urgent operational issues of World War II, the philosophy and methodology of OR has permeated the resolution of decision problems in business, industry, and government. The Timeline chronicles the history of OR in the form of self-contained, expository entries. Each entry presents a concise explanation of the events and people under discussion, and provides key sources where further relevant information can be obtained. In addition, books and papers that have influenced the development of OR or helped to educate the first generations of OR academics and practitioners are cited throughout the book. Starting in 1564 with seminal ideas that form the precursors of OR, the Timeline traces the key ideas and events of OR through 2004. The Timeline should interest anyone involved in OR - researchers, practitioners, academics, and, especially, students - who wish to learn how OR came into being. Further, the scope and expository style of the Timeline should make it of value to the general reader interested in the development of science and technology in the last half of the twentieth century.
Consider the problems involving providing answers to the following questions: The COVID19 vaccines, required urgently in the next nine months in a certain country, are produced in batches. Then what should be the batch size and the time between batches of the vaccine so as to minimise the overall cost of producing the vaccine in the nine months? How many meals of each type of diet should one take in a month so as to minimise the cost of the meals while meeting the minimum requirements of proteins, carbohydrates and vitamins? How many tellers and how fast should they serve customers in a bank so as to keep the queues of customers below a given length within the budget of the operations of the bank? How much sugar should a family buy and how often so as to meet the demand of sugar in the family at minimum overall costs (price-value, cost of ordering and cost of keeping the sugar)? The solutions to such problems (referred to as optimisation problems) are profoundly catered for through Operations Research/Management Science techniques, and the books in the Operations Research Series, starting with this one, are just about these wonderful techniques. This first book of the series lays the epistemological foundation, introducing the foundation concepts and techniques in the major sub-disciplines of Operations Research (Linear Optimisation, Inventory Analysis, Queueing Theory and Network Analysis). The approach to the development of the subject matter emphasises the distinction between concepts and techniques on one hand and the optimisation problems on the other; with the epistemological framework of Operations Research as a science explicitly introduced and emphasised throughout the book series. And a clear definitions and descriptions of the concepts in Operations Research are accentuated as foundations of the respective methods and techniques. The writing style in the series is deliberately chosen to make the books lecture Operations Research to the reader and in such a way that the reader enjoys the knowledge and its applications without fear of numbers, mathematical formulae and figures. After all, Operations Research techniques deal with facts and not numbers nor figures! The main topics covered are as below: 1: FOUNDATION CONCEPTS IN OPERATIONS RESEARCH 1.1: GENERAL NATURE OF OPERATIONS RESEARCH 1.2: STAGES IN THE APPLICATION OF OPERATIONS RESEARCH 1.3: MAIN CATEGORIES OF OPERATIONS RESEARCH MODELS 1.4: EXERCISES 2: LINEAR OPTIMISATION PROBLEMS AND MODELS 2.1: STRUCTURE OF LINEAR PROGRAMMING MODELS 2.2: FORMULATION EXAMPLES OF LINEAR PROGRAMMING MODELS 2.3: CANONICAL MODELS 2.4: DUAL MODELS 2.5: EXERCISES 3: SOLUTIONS OF LINEAR PROGRAMMING MODELS 3.1: ROOT CONCEPTS AND DEFINITIONS 3.2: SOLUTION METHODS: GRAPHICAL METHOD 3.3: SOLUTIONS OF CANONICAL MODELS 3.4: PRIMAL MODEL AND DUAL MODEL OPTIMAL SOLUTIONS RELATIONSHIP 3.5: EXERCISES 4: INVENTORY OPTIMISATION PROBLEMS AND MODELS 4.1: INOPAMETS AND INVENTORY OPTIMISATION PROBLEMS 4.2: SIMPLE ECONOMIC ORDER QUANTITY (SIMPLE EOQ) MODEL 4.3: EXERCISES 5: QUEUEING OPTIMISATION PROBLEMS AND MODELS 5.1: EPISTEMOLOGICAL FORMATION OF QUEUEING OPTIMISATION 5.2: QUEUEING OPTIMISATION AMETS (QUOPAMETS) 5.3: QUEUEING SYSTEMS IN QUOPAMETS 5.4: STRUCURE OF QUEUEING OPTIMISATION PROBLEMS 5.5: SP;M[M;1] OPTIMISATION FRAMEWORKS 5.6: EXERCISES 6: NETWORK OPTIMISATION PROBLEMS AND MODELS

6.1: EPISTEMOLOGICAL FORMATION OF NETWORK ANALYSIS 6.2: NETWORKS AND THEIR CHARACTERISTICS 6.3: NETWORK OPTIMISATION AMETS AND PROBLEMS 6.4: PROJECT-MANAGEMENT OPTIMISATION FRAMEWORKS 6.5: EXERCISES

The breadth of information about operations research and the overwhelming size of previous sources on the subject make it a difficult topic for non-specialists to grasp. Fortunately, Introduction to the Mathematics of Operations Research with Mathematica®, Second Edition delivers a concise analysis that benefits professionals in operations research and related fields in statistics, management, applied mathematics, and finance. The second edition retains the character of the earlier version, while incorporating developments in the sphere of operations research, technology, and mathematics pedagogy. Covering the topics crucial to applied mathematics, it examines graph theory, linear programming, stochastic processes, and dynamic programming. This self-contained text includes an accompanying electronic version and a package of useful commands. The electronic version is in the form of Mathematica notebooks, enabling you to devise, edit, and execute/reexecute commands, increasing your level of comprehension and problem-solving. Mathematica sharpens the impact of this book by allowing you to conveniently carry out graph algorithms, experiment with large powers of adjacency matrices in order to check the path counting theorem and Markov chains, construct feasible regions of linear programming problems, and use the "dictionary" method to solve these problems. You can also create simulators for Markov chains, Poisson processes, and Brownian motions in Mathematica, increasing your understanding of the defining conditions of these processes. Among many other benefits, Mathematica also promotes recursive solutions for problems related to first passage times and absorption probabilities.

Industrial engineering has expanded from its origins in manufacturing to transportation, health care, logistics, services, and more. A common denominator among all these industries, and one of the biggest challenges facing decision-makers, is the unpredictability of systems. Probability Models in Operations Research provides a comprehensive overview of the probabilistic and stochastic modeling approaches commonly used to capture the randomness in industrial and systems engineering.

Here is the first systematic handbook treatment of quantitative modeling natural resource problems, their allocated efficient use, and societal and economic impact. Andrés Weintraub is the very top person in Natural Resource research. He has selected co-editors who are at the top of the sub-fields in natural resources: agriculture, fisheries, forestry, and mining. The book covers these areas with contributions from researchers on, among others, modeling natural research problems, quantifying data, and developing algorithms.

The second edition of this well-organized and comprehensive text continues to provide an in-depth coverage of the theory and applications of operations research. It emphasizes the role of operations research not only as an effective decision-making tool, but also as an essential productivity improvement tool to deal with real-world management problems. This New Edition includes new carefully designed numerical examples that help in understanding complex mathematical concepts better. The book is an easy read, explaining the basics of operations research and discussing various optimization techniques such as linear and non-linear programming, dynamic programming, goal programming, parametric programming, integer programming, transportation and assignment problems, inventory control, and network techniques. It also gives a comprehensive account of game theory, queueing theory, project management, replacement and maintenance analysis, and production scheduling. NEW TO THIS EDITION Inclusion of quantity discount models for transportation problem. Updated inventory control model and detailed discussion on application of dynamic programming in the fields of cargo loading and single-machine scheduling. Numerous new examples that explain the operations research concepts better. New questions with complete solutions to selected problems. This book, with its many student friendly features, would be eminently suitable as a text for students of engineering (mechanical, production and industrial engineering), management, mathematics, statistics, and postgraduate students of commerce and computer applications (MCA).

This book treats all kind of data in neutrosophic environment, with real-life applications, approaching topics as linear programming problem, linear fractional programming, integer programming, triangular neutrosophic numbers, single valued triangular neutrosophic number, neutrosophic optimization, goal programming problem, Taylor series, multi-objective programming problem, neutrosophic geometric programming, neutrosophic topology, neutrosophic open set, neutrosophic semi-open set, neutrosophic continuous function, cylindrical skin plate design, neutrosophic MULTIMOORA, alternative solutions, decision matrix, ratio system, reference point method, full multiplicative form, ordinal dominance, standard error, market research, and so on. The selected papers deal with the alleviation of world changes, including changing demographics, accelerating globalization, rising environmental concerns, evolving societal relationships, growing ethical and governance concern, expanding the impact of technology; some of these changes have impacted negatively the economic growth of private firms, governments, communities, and the whole society.

The volume comprises a collection of 172 extented abstracts of talks presented at the 16th Symposium on Operations Rese- arch held at the University of Trier in September 1991. It is designated to serve as a quickly published documentation of the scientific activities of the conference. Subjects and areas touched upon include theory, modelling and computational methods in optimization, combinatorial op- timization and discrete mathematics, combinatorial problems in VLSI, scientific computing, stochastic and dynamic opti- mization, queuing, scheduling, stochastics and econometrics, mathematical economics and game theory, utility, risk, insu- rance, financial engineering, computer science in business and economics, knowledge engineering and production and ma- nufacturing.

In a rapidly developing field like Operations Research, its easy to get overwhelmed by the variety of topics and analytic techniques. Paul Jensen and Jonathan Bard help you master the expensive field by focusing on the fundamental models and methodologies underlying the practice of Operations Research. Bridging the gap between theory and practice, the author presents the quantitative tools and models most important to understanding modern operations research. You'll come to appreciate the power of OR techniques in solving real-world problems and applications in your own field. You'll learn how to translate complex situations into mathematical models, solve models and turn models into solutions. This text is designed to bridge the gap between theory and practice by presenting the quantitative tools and models most suited for modern operations research. The principal goal is to give analysts, engineers, and decision makers a larger appreciation of their roles by defining a common terminology and by explaining the interfaces between the underlying methodologies. Features Divides each subject into methods and models, giving you greater flexibility in how you approach the material. Concise and focused presentation highlights central ideas. Many examples throughout the text will help you better understand mathematical material.

Optimization and Operations Research is a component of Encyclopedia of Mathematical Sciences in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Optimization and Operations Research is organized into six different topics which represent the main scientific areas of the theme: 1. Fundamentals of Operations Research; 2. Advanced Deterministic Operations Research; 3. Optimization in Infinite Dimensions; 4. Game Theory; 5. Stochastic Operations Research; 6. Decision Analysis, which are then expanded into multiple subtopics, each as a chapter. These four volumes are aimed at the following five major target audiences: University and College students Educators, Professional Practitioners, Research Personnel

and Policy Analysts, Managers, and Decision Makers and NGOs.

A handbook in the truest sense of the word, the first edition of the Operations Research Calculations Handbook quickly became an indispensible resource. While other books available tend to give detailed information about specific topics, this one contains comprehensive information and results useful for real-world problem solving. Reflecting the breadth and depth of growth in the field, the scope of the second edition has been expanded to cover several additional topics. And as with the first edition, it focuses on presenting analytical results and formulas that allow quick calculations and provide understanding of system models. See what's in the Second Edition: New chapters include Order Statistics, Traffic Flow and Delay, and Heuristic Search Methods New sections include Distance Norms, Hyper-Exponential and Hypo-Exponential Distributions Newly derived formulas and an expanded reference list Like its predecessor, the new edition of this handbook presents the analytical results and formulas needed in the scientific applications of operations research and management. It continues to provide quick calculations and insight into system performance. Presenting practical results and formulas without derivations, the material is organized by topic and offered in a concise format that allows ready-access to a wide range of results in a single volume. The field of operations research encompasses a growing number of technical areas, and uses analyses and techniques from a variety of branches of mathematics, statistics, and other scientific disciplines. And as the field continues to grow, there is an even greater need for key results to be summarized and easily accessible in one reference volume. Yet many of the important results and formulas are widely scattered among different textbooks and journals and are often hard to find in the midst of mathematical derivations. This book provides a one-stop resource for many important results and formulas needed in operations research and management science applications.

A Symposium was held on February 25, 2006 in honor of the 80th birthday of Saul I. Gass and his major contributions to the field of operations research over 50 years. This volume includes articles from each of the Symposium speakers plus 16 other articles from friends, colleagues, and former students. Each contributor offers a forward-looking perspective on the future development of the field.

Solutions manual for Introduction to operations research, second editionOperations ResearchA Model-Based ApproachSpringer

Confusing Textbooks? Missed Lectures? Not Enough Time? Fortunately for you, there's Schaum's Outlines. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you Practice problems with full explanations that reinforce knowledge Coverage of the most up-to-date developments in your course field In-depth review of practices and applications Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time-and get your best test scores! Schaum's Outlines-Problem Solved.

Proceedings of the Joint Meeting of the Austrian and Swiss Operations Research Societies, Vienna, September 22-24, 1980

Providing students with a commonsense approach to the solution of engineering problems and packed full of practical case studies to illustrate the role of the engineer, the type of work involved and the methodologies employed in engineering practice, this textbook is a comprehensive introduction to the scope and nature of engineering. It outlines a conceptual framework for undertaking engineering projects then provides a range of techniques and tools for solving the sorts of problems that commonly arise. Focusing in particular on civil engineering design, problem solving, and the range of techniques and tools it employs, the authors also explore: creativity and problem solving, social and environmental issues, management, communications and law, and ethics the planning, design, modelling and analysis phases and the implementation or construction phase. Designed specifically for introductory courses on undergraduate engineering programs, this extensively revised and extended second edition is an invaluable resource for all new engineering undergraduates as well as non-specialist readers who are seeking information on the nature of engineering work and how it is carried out.

Operations Research: A Practical Introduction is just that: a hands-on approach to the field of operations research (OR) and a useful guide for using OR techniques in scientific decision making, design, analysis and management. The text accomplishes two goals. First, it provides readers with an introduction to standard mathematical models and algorithms. Second, it is a thorough examination of practical issues relevant to the development and use of computational methods for problem solving. Highlights: All chapters contain up-to-date topics and summaries A succinct presentation to fit a one-term course Each chapter has references, readings, and list of key terms Includes illustrative and current applications New exercises are added throughout the text Software tools have been updated with the newest and most popular software Many students of various disciplines such as mathematics, economics, industrial engineering and computer science often take one course in operations research. This book is written to provide a succinct and efficient introduction to the subject for these students, while offering a sound and fundamental preparation for more advanced courses in linear and nonlinear optimization, and many stochastic models and analyses. It provides relevant analytical tools for this varied audience and will also serve professionals, corporate managers, and technical consultants.

This book provides a complete overview of production systems and describes the best approaches to analyze their performance. Written by experts in the field, this work also presents numerous techniques that can be used to describe, model, and optimize the performance of various types of production lines. The book is intended for researchers, production managers, and graduate students in industrial, mechanical, and systems engineering.

The first graduate-level text devoted to the subject, this classic offers a concise history and overview of methods as well as an excellent exposition of the mathematical foundations underlying classical operations research procedures. It begins with a review of historical, scientific, and mathematical aspects; examples and ideas related to classical methods of forming models introduce discussions of optimization, game theory, applications of probability, and queuing theory. Carefully selected exercises illustrate important and useful ideas. This text is an ideal introduction for students to the basic mathematics of operations research as well as a valuable source of references to early literature on operations research. 1959 edition.

A single source guide to operations research (OR) techniques, this book covers emerging OR methodologies in a clear, concise, and unified manner. Building a bridge between theory and practice, it begins with coverage of fundamental models and methods such as linear, nonlinear, integer, and dynamic programming, networks, simulation, queuing, inventory, stochastic processes, and decision analysis. The book then explores emerging techniques including multiple criteria optimization, meta heuristics, robust optimization, and complexity and large scale networks. Each chapter gives an overview of a particular methodology, illustrates successful applications, and provides references to computer software availability.

This proceedings volume contains extended abstracts of talks presented at the 18th Symposium on Operations Research held at the University of Cologne, September 1-3, 1993. The Symposia on Operations Research are the annual meetings of the Gesellschaft fiir Mathematik, Okonometrie und Operations Research (GMOOR), a scientific society providing a link between research and applications in the areas of applied mathematics, economics and operations research. The broad range of interests and scientific activities covered by GMOOR and its members was demonstrated by about 250 talks presented at the 18th Symposium. As in l'ecent years, emphasis was placed on optimization and stochastics, this year with a special focus on combinatorial optimization and discrete mathematics. We appreciate that with sections on parallel and distributed computing and on scientific computing also new fields could be integrated into the scope of the GMOOR. This book contains extended abstracts of most of the papers presented at the con ference. Long versions and full papers of the talks are expected to appear elsewhere in refereed periodicals. The contributions were divided into sixteen sections: (1) Theory of Optimization, (2) Computational Methods of Optimization, (3) Combinatorial Optimization and Dis crete Mathematics, (4) Scientific Computing, (5) Decision Theory, (6) Mathematical Economics and Game Theory, (7) Banking, Finance and Insurance, (8) Econometrics, (9) Macroeconomics and Economic Theory, (10) Stochastics, (11) Production and Lo gistics, (12) System and Control Theory, (13) Routing and Scheduling, (14) Knowledge Based Systems, (15) Information Systems and (16) Parallel and Distributed Compu ting.

The book covers the standard models and techniques used in decision making in organizations. The main emphasis of the book is on modeling business-related scenarios and the generation of decision alternatives. Fully solved examples from many areas are used to illustrate the main concepts without getting bogged down in technical details. The book presents an approach to operations research that is heavily based on modeling and makes extensive use of sensitivity analyses. It is a result of many years of combined teaching experience of the authors. The second edition adds new material on multi-criteria optimization, postman problems, Lagrangian relaxation, cutting planes, machine scheduling, and Markov chains. Support material is found on a free website and includes some algorithms, additional fully solved problems and slides for instructors.

The disciplines of computer science and operations research (OR) have been linked since their origins, each contributing to the dramatic advances of the other. This work explores the connections between these key technologies: how high-performance computing methods have led to advances in OR de ployment, and how OR has contributed to the design and development of ad vanced systems. The collected writings-from researchers and practitioners in Computer Science, Operations Research, Management Science, and Artificial Intelligence-were among those delivered at the Fifth INFORMS Computer Science Technical Section Conference in Dallas, Texas, January 8-10, 1996. The articles advance both theory and practice. Presented are new approaches to complex problems based on: metaheuristics (neural networks, genetic al gorithms, and Tabu Search), optimization and mathematical programming, stochastic methods, constraint programming, and logical analysis. These ad vanced methodologies are applied to new applications in such areas as: telecom munications network design, financial engineering, manufacturing, project man agement, and forecasting, airline and machine scheduling, vehicle routing, mod eling and decision support systems. Featured is a remarkable paper by keynote speaker Fred Glover, creator of the Tabu Search family of metaheuristics. In it he develops the principles of memory-based heuristic methods, contrasts them with the popular genetic algorithms and simulated annealing, provides a sweeping survey of application vignettes, and points to promising avenues for future research. Industrial Management has been specifically written and designed for BTech students with special emphasis on Gautam Buddh Technical University (GBTU) and Mahamaya Technical University (MMTU). The book addresses the core theories of industrial management to help students apply their knowledge in future managerial decision making. The presentation of this book has been kept simple and lucid so that theories and their possible applications are easily comprehensible to the students. Adequate industry examples make this an enjoyable read.

This volume reflects the theme of the INFORMS 2004 Meeting in Denver: Back to OR Roots. Emerging as a quantitative approach to problem-solving in World War II, our founders were physicists, mathematicians, and engineers who quickly found peace-time uses. It is fair to say that Operations Research (OR) was born in the same incubator as computer science, and it has spawned many new disciplines, such as systems engineering, health care management, and transportation science. Although people from many disciplines routinely use OR methods, many scientific researchers, engineers, and others do not understand basic OR tools and how they can help them. Disciplines ranging from finance to bioengineering are the beneficiaries of what we do — we take an interdisciplinary approach to problem-solving. Our strengths are modeling, analysis, and algorithm design. We provide a quanti- tive foundation for a broad spectrum of problems, from economics to medicine, from environmental control to sports, from e-commerce to computational - ometry. We are both producers and consumers because the mainstream of OR is in the interfaces. As part of this effort to recognize and extend OR roots in future probl- solving, we organized a set of tutorials designed for people who heard of the topic and want to decide whether to learn it. The 90 minutes was spent addre- ing the questions: What is this about, in a nutshell? Why is it important? Where can I learn more? In total, we had 14 tutorials, and eight of them are published here. This volume presents state-of-the-art models, algorithms, and applications of quantitative methods in management and economics. The papers are clustered into four parts, focusing on optimization issues, applications of Operations Research in production and service management, applications of Operations Research in logistics, and interdisciplinary approaches.

Research Methods for Operations Management, second edition is a toolkit of research approaches primarily for advanced students and beginner researchers but also a reference book for any researcher in OM. Many students begin their career in research limited by the one or few approaches taken by their department. The concise, accessible overviews found here equip them with an understanding of a variety of methods and how to use them, enabling them to tailor their research project to their own strengths and goals. The more seasoned researcher will find comprehensive descriptions and analyses on a wide variety of research approaches. This updated and enhanced edition responds to the latest developments in OM, including the growing prominence of services and production of intangible products, and the increasing use of secondary data and of mixed approaches. Alternative research approaches are included and explored to help with the early planning of research. This edition also includes expanded literature review and analysis to guide students towards the next steps in their reading, and more detailed step-by-step advice to tie theory with the researcher's own practice. Including contributions from an impressive range of the field's leading thinkers in OM research, this is a guide that no-one embarking on an OM research project should be without.

The power grid can be considered one of twentieth-century engineering?s greatest achievements, and as grids and populations grow, robustness is a factor that planners must

take into account. Power grid robustness is a complex problem for two reasons: the underlying physics is mathematically complex, and modeling is complicated by lack of accurate data. This book sheds light on this complex problem by introducing the engineering details of power grid operations from the basic to the detailed; describing how to use optimization and stochastic modeling, with special focus on the modeling of cascading failures and robustness; providing numerical examples that show ?how things work?; and detailing the application of a number of optimization theories to power grids.÷

In both rich and poor nations, public resources for health care are inadequate to meet demand. Policy makers and health care providers must determine how to provide the most effective health care to citizens using the limited resources that are available. This chapter describes current and future challenges in the delivery of health care, and outlines the role that operations research (OR) models can play in helping to solve those problems. The chapter concludes with an overview of this book – its intended audience, the areas covered, and a description of the subsequent chapters. KEY WORDS Health care delivery, Health care planning HEALTH CARE DELIVERY: PROBLEMS AND CHALLENGES 3 1.1 WORLDWIDE HEALTH: THE PAST 50 YEARS Human health has improved significantly in the last 50 years. In 1950, global life expectancy was 46 years [1]. That figure rose to 61 years by 1980 and to 67 years by 1998 [2]. Much of these gains occurred in low- and middle-income countries, and were due in large part to improved nutrition and sanitation, medical innovations, and improvements in public health infrastructure.

This book contains a selection of refereed papers presented at the "International Conference on Operations Research (OR 2011)" which took place at the University of Zurich from August 30 to September 2, 2011. The conference was jointly organized by the German speaking OR societies from Austria (ÖGOR), Germany (GOR) and Switzerland (SVOR) under the patronage of SVOR. More than 840 scientists and students from over 50 countries attended OR 2011 and presented 620 papers in 16 parallel topical streams, as well as special award sessions. The conference was designed according to the understanding of Operations Research as an interdisciplinary science focusing on modeling complex socio-technical systems to gain insight into behavior under interventions by decision makers. Dealing with "organized complexity" lies in the core of OR and designing useful support systems to master the challenge of system management in complex environment is the ultimate goal of our professional societies. To this end, algorithmic techniques and system modeling are two fundamental competences which are also well-balanced in these proceedings.

"Covers the core concepts and theories of production and operations management in the global as well as Indian context. Includes boxes, solved numerical examples, real-world examples and case studies, practice problems, and videos. Focuses on strategic decision making, design, planning, and operational control"--Provided by publisher.

In the modern world, most gross product is created within Enterprise firms, project programs, state agencies, transnational corporations and their divisions, as well as various associations and compositions of the above entities. Enterprises, being, on the one hand, complex, and, on the other hand, widespread systems, are the subject matter of cybernetics, system theory, operations research, management sciences and many other fields of knowledge. However, the complexity of the system obstructs the development of mathematically rigorous foundations for Enterprise control. Moreover, methods of operations research and related sciences, which are widely used in practice, provide optimization of the constituents of an Enterprise, without modeling it as a whole system. But the optimization of parts does not lead to the optimality of the whole, and, also, the absence of top-down and holistic mathematical models of Enterprise contradicts the principle of holism and the system approach. The approach in this book looks first at Enterprise Systems and their essential aspects as complex sociotechnical systems composed of integrated sets of structural and process models (Chapters 1 and 2). A uniform description of all the heterogeneous fields of the modern Enterprise (marketing, sales, manufacturing, HR, finance, etc.) is then made, and the Enterprise Control Problem is posed as a top-down and holistic mathematical optimization problem (Chapter 3). Original models and methods of contract theory (Chapter 4), technology management (Chapter 5), human behavior and human capital (Chapter 6) and complex activity and resource planning (Chapter 7) are developed to solve the problem. Structural processes and mathematical models constitute an Optimal Enterprise Control Framework (Chapter 8) that provides a practical solution to the Enterprise Control Problem. This book is a resource for postgraduate and doctoral students, postdoctoral researchers and professors with research interests in the following fields of science: Fundamental Complex Systems study, Complex Systems Engineering, Enterprise Systems Engineering Applications of Operations Research, Optimization, Probability and Stochastic processes to Management Science, Economics and Business Theory of the Firm Business and Management – general, strategy/leadership, organization management, operations management and management information systems Theory of Business Processes, Business Processes Improvement and Reengineering

This issue of the Journal of Applied Operational Research (JAOR) includes contemporary research being conducted by operations researchers across three continents supporting military forces. It features diverse works submitted by the Director General Military Personnel Research and Analysis in Canada, Defence Science and Technology Group in Australia, the Finnish Defence Research Agency, Naval Postgraduate School in the USA, and Naval Surface Warfare Centre in the USA. Together, they represent cutting-edge contributions to furthering the application of advanced analytical tools and techniques to the field of military operations.