

Industrial Engineering And Management By Ravi Shankar

Being the premier forum for the presentation of new advances and research results in the fields of Industrial Engineering, IEEM 2015 aims to provide a high-level international forum for experts, scholars and entrepreneurs at home and abroad to present the recent advances, new techniques and applications face and face, to promote discussion and interaction among academics, researchers and professionals to promote the developments and applications of the related theories and technologies in universities and enterprises, and to establish business or research relations to find global partners for future collaboration in the field of Industrial Engineering. All the goals of the international conference are to fulfill the mission of the series conference which is to review, exchange, summarize and promote the latest achievements in the field of industrial engineering and engineering management over the past year, and to propose prospects and vision for the further development. This volume is the second of the two proceedings volumes from this conference.

The book is primarily intended as a text for all branches of B.Tech, M.Tech and MBA courses. Beginning with an introduction to industrial engineering, it discusses contributions and thoughts of classical (Taylor, Fayol, and Weber's), neo-classical (Hawthorne) and modern thinkers. The book explains different functions of management, and differentiate between management and administration. Various types of business organisations with their structures and personnel management also find place in the book. Topics related to facilities location, material handling, work study, job evaluation and merit rating, wages and incentives that are of prime importance in any business are discussed. The book is aimed at providing a better understanding of industrial operations with practical approach. Financial aspects related to business operations such as financial management, management accounting, breakeven analysis, depreciation and replacement policies for equipment assume prime importance. Numerical examples have been solved at appropriate places to create interest in readers. Marketing aspects of business as marketing management, new product development and sales forecasting methods are discussed, besides management and control of operations. For maintaining industrial peace, good relationship between employers and employees is essential. Chapters on industrial relations, industrial safety and industrial legislations are introduced with the objective of providing readers with information on these important aspects. Good decision-making is what differentiates a good manager from a bad one. Thus, a chapter on decision-making is added to examine its skill. Network constructions, CPM, PERT have been covered under project management. Quantitative techniques for decision-making as linear programming, transportation problems, assignment problems, game theory, queuing theory, etc., are also discussed in this textbook. KEY FEATURES • Lucid presentation of the concepts. • Illustrative figures and tables make the reading more fruitful and enriching. • Numerical problems with solutions form an integral part of the book, making it application-oriented. • Chapter-end review questions test the students' knowledge of the fundamental concepts.

This book explains the requirements of ISO 9001 for establishing quality management system (QMS) for an organization. The requirements are illustrated with examples from industries for understanding the requirements and preparing the documents of QMS with high clarity. Methods of integrating ISO 9001 requirements with enterprise resource planning (ERP) software are presented. The software integrated approach enables process owners to focus on their core tasks of achieving the planned outputs of processes and the software generates quality records automatically.

This book deals with methodological issues in the field of management and industrial engineering. It aims to answer the following questions

that researchers face every time they look to develop their research: How can we design a research project? What kind of paradigm should we follow? Should we develop a qualitative / phenomenological research or a quantitative / positivistic one? What technics for data collections can we use? Should we use the entire population or a sample? What kind of sampling techniques can we have? This book provides discussion and the exchange of information on principles, strategies, models, techniques, applications and methodological options possible to develop in research in management and industrial engineering. It communicates the latest developments and thinking on the research methodologies subject in the different areas, worldwide. It seeks cultural and geographic diversity in studies highlighting research methodologies that can be used in these different study areas. This book has a special interest in research on important issues that transcend the boundaries of single academic subjects. It presents contributions that challenge the paradigms and assumptions of individual disciplines or functions, with chapters grounded in conceptual and / or empirical literature. The main aim of this book is to provide a channel of communication to disseminate knowledge between academics and researchers, with a special focus on the management and industrial engineering fields. This book can serve as a useful reference for academics, researchers, managers, engineers, and other professionals in related matters with research methodologies. Contributors have identified the theoretical and practical implications of their methodological options to the development and improvement of their different study and research areas.

The book has been designed for undergraduate students studying Mechanical Engineering or Industrial Engineering. It discusses various concepts and provides practical knowledge related to the area of Industrial Engineering and Management. The book lucidly covers Project Management, Quality Management, Costing etc. in detail to develop the required skills among the students.

Increasing costs and higher utilization of resources make the role of process improvement more important than ever in the health care industry. *Management Engineering: A Guide to Best Practices for Industrial Engineering in Health Care* provides an overview of the practice of industrial engineering (management engineering) in the health care industry. Explaining how to maximize the unique skills of management engineers in a health care setting, the book provides guidance on tried and true techniques that can be implemented easily in most organizations. Filled with tools and documents to help readers communicate more effectively, it includes many examples and case studies that illustrate the proper application of these tools and techniques. Containing the contributions of accomplished healthcare process engineers and process improvement professionals, the book examines Lean, Six Sigma, and other process improvement methodologies utilized by management engineers. Illustrating the various roles an industrial engineer might take on in health care, it provides readers with the practical understanding required to make the most of time-tested performance improvement tools in the health care industry. Suitable for IE students and practicing industrial engineers considering a move into the health care industry, or current healthcare industrial engineers wishing to expand their practice, the text can be used as a reference to explore individual topics, as each of the chapters stands on its own. Also, senior healthcare executives will find that the book provides insights into how the practice of management engineering can provide sustainable improvements in their organizations. To get a good overview of how your organization can best benefit from the efforts of industrial engineers, this book is a must-read.

This second edition details all productivity and quality methodologies, principles and techniques, and demonstrates how they interact in the three phases of the productivity and quality management triangle (PQMT): measurement, control and evaluation; planning and analysis; and improvement and monitoring. This edition features material on practical strategies for implementing quality programmes, balancing productivity and quality results , resolving quality problems and empowering employees.

This proceedings volume gathers together selected peer-reviewed papers presented at the second edition of the XXVI International Joint Conference on Industrial Engineering and Operations Management (IJCIEOM), which was virtually held on February 22-24, 2021 with the main organization based at the Pontifical Catholic University of Rio de Janeiro, Brazil. Works cover a range of topics in industrial engineering, including operations and process management, global operations, managerial economics, data science and stochastic optimization, logistics and supply chain management, quality management, product development, strategy and organizational engineering, knowledge and information management, sustainability, and disaster management, to name a few. These topics broadly involve fields like operations, manufacturing, industrial and production engineering, and management. This book can be a valuable resource for researchers and practitioners in optimization research, operations research, and correlated fields.

This textbook presents methodologies and applications associated with multiple criteria decision analysis (MCDA), especially for those students with an interest in industrial engineering. With respect to methodology, the book covers (1) problem structuring methods; (2) methods for ranking multi-dimensional deterministic outcomes including multiattribute value theory, the analytic hierarchy process, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and outranking techniques; (3) goal programming; (4) methods for describing preference structures over single and multi-dimensional probabilistic outcomes (e.g., utility functions); (5) decision trees and influence diagrams; (6) methods for determining input probability distributions for decision trees, influence diagrams, and general simulation models; and (7) the use of simulation modeling for decision analysis. This textbook also offers:

- Easy to follow descriptions of how to apply a wide variety of MCDA techniques
- Specific examples involving multiple objectives and/or uncertainty/risk of interest to industrial engineers
- A section on outranking techniques ; this group of techniques, which is popular in Europe, is very rarely mentioned as a methodology for MCDA in the United States
- A chapter on simulation as a useful tool for MCDA, including ranking & selection procedures. Such material is rarely covered in courses in decision analysis
- Both material review questions and problems at the end of each chapter . Solutions to the exercises are found in the Solutions Manual which will be provided along with PowerPoint slides for each chapter. The methodologies are demonstrated through the use of applications of interest to industrial engineers, including those involving product mix optimization, supplier selection, distribution center location and transportation planning, resource allocation and scheduling of a medical clinic, staffing of a call center, quality control, project management, production and inventory control, and so on. Specifically, industrial engineering problems are structured as classical problems in multiple criteria decision analysis, and the relevant methodologies are demonstrated.

The Book Explains The Subject Through A Series Of Graded Questions And Answers And Thus Helps The Students In A Better Preparation For Their Examinations. Some Questions Are Of Short Answer Type For Which Answers Are Presented In A Paragraph. Some Questions Are Of Subjective Type For Which Answers Are Presented At

Length. Whenever Quantitative Techniques Arise, The Procedures Are Discussed Giving The Logical/Scientific Basis For The Various Steps Or Operations. Techniques Are Illustrated. Emphasis Is Laid On Analyzing Different Classes Of Managerial Problems By Properly Modelling And Tackling Them Using The Right Technique/S. The Book Covers The Core Subjects Of Industrial Engineering, Like Productivity Engineering, Work Method Design And Work Measurement, Linear Programming, Classical Optimization, Reliability And Quality Engineering, Production Economics And Financial Management And Production Management. Designed For Undergraduate And Postgraduate Students Of Both Engineering And Management Streams, It Is Hoped That This Book Would Not Only Help Them In Preparing For Examinations But Would Also Enable Them To Emerge As Successful Managers. The Book Would Also Be Extremely Useful For Candidates Appearing In Gate And Other Competitive Examinations.

This book communicates the latest developments and thinking on the coaching subject worldwide. It presents insights into coaching in the management and engineering field on an international and transnational scale. The chapters contain innovative models, processes, strategies and uses, as well as the most recent research activities relating to coaching. This book highlights key issues and uses related to coaching for managers and engineers.

Industrial Engineering Foundations Bridging the Gap between Engineering and Management Stylus Publishing, LLC Based on the 2018 International Joint Conference on Industrial Engineering and Operations Management (IJCIEOM) conference that took place in Lisbon, Portugal, this proceedings volume is the first of two focusing on mathematical applications in digital transformation. The different contributions in this volume explore topics such as modelling, simulation, logistics, innovation, sustainability, health care, supply chain, lean manufacturing, operations management, quality and digital. Written by renowned scientists from around the world, this multidisciplinary volume serves as a reference on industrial engineering and operations management and as a source on current findings for researchers and students aiming to work on industrial-related problems.

In light of increasing economic and international threats, military operations must be examined with a critical eye in terms of process design, management, improvement, and control. Although the Pentagon and militaries around the world have utilized industrial engineering (IE) concepts to achieve this goal for decades, there has been no single resource to bring together IE applications with a focus on improving military operations. Until now. Winner of the 2010 IIE/Joint Publishers Book-of-the-Year Award The Handbook of Military Industrial Engineering is the first compilation of the fundamental tools, principles, and modeling techniques of industrial engineering with specific and direct application to military systems. Globally respected IE experts provide proven strategies that can help any military organization effectively create, adapt, utilize, and deploy resources, tools, and technology. Topics covered include: Supply Chain Management and decision

making Lean Enterprise Concepts for military operations Modeling and optimization Economic planning for military systems Contingency planning and logistics Human factors and ergonomics Information management and control Civilian engineers working on systems analysis, project management, process design, and operations research will also find inspiration and useful ideas on how to effectively apply the concepts covered for non-military uses. On the battlefield and in business, victory goes to those who utilize their resources most effectively, especially in times of operational crisis. The Handbook of Military Industrial Engineering is a complete reference that will serve as an invaluable resource for those looking to make the operational improvements needed to accomplish the mission at hand.

This volume provides a complete record of presentations made at Industrial Engineering, Management Science and Applications 2015 (ICIMSA 2015), and provides the reader with a snapshot of current knowledge and state-of-the-art results in industrial engineering, management science and applications. The goal of ICIMSA is to provide an excellent international forum for researchers and practitioners from both academia and industry to share cutting-edge developments in the field and to exchange and distribute the latest research and theories from the international community. The conference is held every year, making it an ideal platform for people to share their views and experiences in industrial engineering, management science and applications related fields.

The purpose of the 4th International Asia Conference on Industrial Engineering and Management Innovation (IEMI 2013) is to bring together researchers, engineers and practitioners interested in the application of informatics to usher in new advances in the industrial engineering and management fields.

The 2014 International Conference on Industrial Engineering and Management Science (IEMS 2014) was held August 8-9, 2014, in Hong Kong. This proceedings volume assembles papers from various professionals, leading researchers, engineers, scientists and students and presents innovative ideas and research results focused on Industrial Engineering and

"This book focuses on the latest innovations in the process of manufacturing in engineering"--Provided by publisher.

This book covers the important elements of industrial engineering that all engineers need to know in order to become effective in their day-to-day activities. It explores basic topics such as scheduling, quality control, forecasting, and queueing theory. Other topics include paving a path to production control, engineering and its management, and the operational aspects of manufacturing and service industries. The reader will learn to apply these principles and tools, not only to initiate improvements in their places of work, but also to pave career path to management and positions with higher levels of responsibility and decision-making. This invaluable resource is a professional book for all engineers and an all-in-one refresher reference for industrial engineers. Features:

- Emphasizes scheduling and sequencing of operations and quality control
- Includes cases from various engineering disciplines and tailored to the field, such as manufacturing plants and service industries
- Exposes the reader to the basic concepts of a range of topics in industrial engineering and demonstrates how and why the application of such concepts can be effective in improving

efficiency and productivity in both start-up companies and large corporations

This book presents the proceedings of the 3rd International Joint Conference – ICIEOM-ADINGOR-IISE-AIM-ASEM (IJC2017) “XXIII International Conference on Industrial Engineering and Operations Management”, “International ADINGOR Conference 2017”, “International IISE Conference 2017”, “International AIM Conference 2017” and “International ASEM Conference 2017”, which took place at UPV (Universitat Politècnica de València) from July 6th to 7th, 2017. This joint conference is the result of an agreement between ABEPRO (Associação Brasileira de Engenharia de Produção), ADINGOR (Asociación para el Desarrollo de la Ingeniería de Organización), IISE (Institute of Industrial and Systems Engineers), AIM (European Academy for Industrial Management) and ASEM (American Society for Engineering Management). Consisting of papers on new global perspectives on industrial engineering and management, the book offers an interdisciplinary view of industrial engineering and management. The topics covered include: strategy and entrepreneurship, quality and product management, modelling and simulation, knowledge and project management, logistics, as well as production, information and service systems.

Principles of Economics and Management for Manufacturing Engineering combines key engineering economics principles and applications in one easy to use reference. Engineers, including design, mechanical, and manufacturing engineers are frequently involved in economics-related decisions, whether directly when selecting materials or indirectly when managers make order quantity decisions based on their work. Having a knowledge of the management and economic activities that touch on engineering work is a core part of most foundational engineering qualifications and becomes even more important in industry. Covering a wide range of management and economic topics from the point-of-view of an engineer in industry, this reference provides everything needed to understand the commercial context of engineering work. Covers the full range of basic economic concepts as well as engineering economics topics Includes end of chapter questions and chapter summaries that make this an ideal self-study resource Provides step-by-step instructions for cost accounting for engineers

For close to 20 years, “Industrial Engineering and Production Management” has been a successful text for students of Mechanical, Production and Industrial Engineering while also being equally helpful for students of other courses including Management.

Divided in 5 parts and 52 chapters, the text combines theory with examples to provide in-depth coverage of the subject.

This book provides discussions and the exchange of information on principles, strategies, models, techniques, methodologies and applications of industrial engineering. It communicates the latest developments and research activity on industrial engineering and is useful for all those interested in the technological challenges in the field.

The International Conference on Industrial Engineering and Engineering Management is sponsored by the Chinese Industrial Engineering Institution, CMES, which is the only national-level academic society for Industrial Engineering. The conference is held annually as the major event in this arena. Being the largest and the most authoritative international academic conference held in China, it provides an academic platform for experts and entrepreneurs in the areas of international industrial engineering and management to exchange their research findings. Many experts in various fields from China and around the world gather together

at the conference to review, exchange, summarize and promote their achievements in the fields of industrial engineering and engineering management. For example, some experts pay special attention to the current state of the application of related techniques in China as well as their future prospects, such as green product design, quality control and management, supply chain and logistics management to address the need for, amongst other things low-carbon, energy-saving and emission-reduction. They also offer opinions on the outlook for the development of related techniques. The proceedings offers impressive methods and concrete applications for experts from colleges and universities, research institutions and enterprises who are engaged in theoretical research into industrial engineering and engineering management and its applications. As all the papers are of great value from both an academic and a practical point of view, they also provide research data for international scholars who are investigating Chinese style enterprises and engineering management.

A Firsthand Look at the Role of the Industrial Engineer The industrial engineer helps decide how best to utilize an organization's resources to achieve company goals and objectives. **Introduction to Industrial Engineering, Second Edition** offers an in-depth analysis of the industrial engineering profession. While also providing a historical perspective chronicling the development of the profession, this book describes the standard duties performed, the tools and terminologies used, and the required methods and processes needed to complete the tasks at hand. It also defines the industrial engineer's main areas of operation, introduces the topic of information systems, and discusses their importance in the work of the industrial engineer. The authors explain the information system concept, and the need for integrated processes, supported by modern information systems. They also discuss classical organizational structures (functional organization, project organization, and matrix organization), along with the advantages and disadvantages of their use. The book includes the technological aspects (data collection technologies, databases, and decision-support areas of information systems), the logical aspects (forecasting models and their use), and aspects of principles taken from psychology, sociology, and ergonomics that are commonly used in the industry. **What's New in this Edition:** The second edition introduces fields that are now becoming a part of the industrial engineering profession, alongside conventional areas (operations management, project management, quality management, work measurement, and operations research). In addition, the book: Provides an understanding of current pathways for professional development Helps students decide which area to specialize in during the advanced stages of their studies Exposes students to ergonomics used in the context of workspace design Presents key factors in human resource management Describes frequently used methods of teaching in the field Covers basic issues relative to ergonomics and human-machine interface Introduces the five basic processes that exist in many organizations **Introduction to Industrial Engineering, Second Edition** establishes industrial engineering as the organization of people and resources, describes the

development and nature of the profession, and is easily accessible to anyone needing to learn the basics of industrial engineering. The book is an indispensable resource for students and industry professionals.

This book describes the latest research developments in modeling and simulation in industrial engineering. Topics such as decision and performance analysis and industrial control systems are described. Case studies in industry and services as well as engineering economy and cost estimation are also covered.

Process Engineering, the science and art of transforming raw materials and energy into a vast array of commercial materials, was conceived at the end of the 19th Century. Its history in the role of the Process Industries has been quite honorable, and techniques and products have contributed to improve health, welfare and quality of life. Today, industrial enterprises, which are still a major source of wealth, have to deal with new challenges in a global world. They need to reconsider their strategy taking into account environmental constraints, social requirements, profit, competition, and resource depletion. "Systems thinking" is a prerequisite for process development at the lab level to good project management. New manufacturing concepts have to be considered, taking into account LCA, supply chain management, recycling, plant flexibility, continuous development, process intensification and innovation. This book combines experience from academia and industry in the field of industrialization, i.e. in all processes involved in the conversion of research into successful operations. Enterprises are facing major challenges in a world of fierce competition and globalization. Process engineering techniques provide Process Industries with the necessary tools to cope with these issues. The chapters of this book give a new approach to the management of technology, projects and manufacturing. Contents Part 1: The Company as of Today 1. The Industrial Company: its Purpose, History, Context, and its Tomorrow?, Jean-Pierre Dal Pont. 2. The Two Modes of Operation of the Company – Operational and Entrepreneurial, Jean-Pierre Dal Pont. 3. The Strategic Management of the Company: Industrial Aspects, Jean-Pierre Dal Pont. Part 2: Process Development and Industrialization 4. Chemical Engineering and Process Engineering, Jean-Pierre Dal Pont. 5. Foundations of Process Industrialization, Jean-François Joly. 6. The Industrialization Process: Preliminary Projects, Jean-Pierre Dal Pont and Michel Royer. 7. Lifecycle Analysis and Eco-Design: Innovation Tools for Sustainable Industrial Chemistry, Sylvain Caillol. 8. Methods for Design and Evaluation of Sustainable Processes and Industrial Systems, Catherine Azzaro-Pantel. 9. Project Management Techniques: Engineering, Jean-Pierre Dal Pont. Part 3: The Necessary Adaptation of the Company for the Future 10. Japanese Methods, Jean-Pierre Dal Pont. 11. Innovation in Chemical Engineering Industries, Oliver Potier and Mauricio Camargo. 12. The Place of Intensified Processes in the Plant of the Future, Laurent Falk. 13. Change Management, Jean-Pierre Dal Pont. 14. The Plant of the Future, Jean-Pierre Dal Pont.

This book provides a basic, conceptual-level description of an Organization, Engineering management disciplines that

overview of how a system is developed. For the Engineers, New joiners, Beginners, Graduates and project manager, it provides a basic framework to understand the meaning of different organizations, planning and assessing system development. Information in the book is from various sources, but main idea is generated through the practical experience of authors. The main aim to publish this book is to get the collective organizational information in one single book for the beginners, Technical and Non-technical employees.

This book presents the proceedings of the XXII International Conference on Industrial Engineering and Operations Management, International IIE Conference 2016, and International AIM Conference 2016. This joint conference is a result of an agreement between ADINGOR (Asociación para el Desarrollo de la Ingeniería de Organización), ABEPRO (Associação Brasileira de Engenharia de Produção), AIM (European Academy for Industrial Management) and the IIE (Institute of Industrial Engineers), and took place at TECNUN-School of Engineering (San Sebastián, Spain) from July 13th to 15th, 2016. The book includes the latest research advances and cutting-edge analyses of real case studies in Industrial Engineering and Operations Management from diverse international contexts, while also identifying concrete business applications for the latest findings and innovations in operations management and the decisions sciences. Industrial engineering is the profession dedicated to making collective systems function better with less waste, better quality, and fewer resources, to serve the needs of society more efficiently and more effectively. This book uses a story-telling approach to advocate and elaborate the fundamental principles of industrial engineering in a simple, interesting, and engaging format. It will stimulate interest in industrial engineering by exploring how the tools and techniques of the discipline can be relevant to a broad spectrum of applications in business, industry, engineering, education, government, and the military. Features Covers the origin of industrial engineering Discusses the early pioneers and profiles the evolution of the profession Presents offshoot branches of industrial engineering Illustrates specific areas of performance measurement and human factors Links industrial engineering to the emergence of digital engineering Uses the author's personal experience to illustrate his advocacy and interest in the profession

This book outlining the latest developments in engineering digital transformation gathers a selection of the best papers presented at the 11th International Conference on Industrial Engineering and Industrial Management (CIO 2017), held in Valencia, Spain, from July 5th to 6th, 2017. The papers discuss topics in the following areas: strategy and entrepreneurship, OR, modelling and simulation, production, logistics and supply chain management, information systems, quality and product management, knowledge and project management, service systems, and education. Industrial Engineering: Management, Tools, and Applications, Three Volume Set provides innovation applications and case studies that are drawn from multiple countries. The chapters in the books represent the best papers from the

International Institute of Industrial Engineering (IIIE) Conference held in Istanbul in June 2013, sponsored by the II
This volume gathers selected peer-reviewed papers presented at the XXVI International Joint Conference on Industrial Engineering and Operations Management (IJCIEOM), held on July 8-11, 2020 in Rio de Janeiro, Brazil. The respective chapters address a range of timely topics in industrial engineering, including operations and process management, global operations, managerial economics, data science and stochastic optimization, logistics and supply chain management, quality management, product development, strategy and organizational engineering, knowledge and information management, work and human factors, sustainability, production engineering education, healthcare operations management, disaster management, and more. These topics broadly involve fields like operations, manufacturing, industrial and production engineering, and management. Given its scope, the book offers a valuable resource for those engaged in optimization research, operations research, and practitioners alike.

The book "Industrial Engineering and Management" covers the syllabus of the subjects Industrial Engineering, Industrial Management, Production Planning and Control, Production Management, Engineering Economics and Costing, Industrial Organization, Principles of Management prescribed by different Indian Universities. The book is also useful for the students of management courses, section B of AIME, and U.P.S.C Engineering Services Examination. Efforts have been made to present the subject-matter in concise, compact and simple language. The theoretical concepts have been supported by large number of numerical illustrations to provide clarity.

This book gathers extended versions of the best papers presented at the Global Joint Conference on Industrial Engineering and Its Application Areas (GJCIE), organized virtually on August 14-15, 2020, by Istanbul Technical University. It covers a wide range of topics, including decision analysis, supply chain management, systems modelling and quality control. Further, special emphasis is placed on cutting-edge applications of industrial Internet-of-Things. Technological, economic and business challenges are discussed in detail, presenting effective strategies that can be used to modernize current structures, eliminating the barriers that are keeping industries from taking full advantage of IoT technologies. The book offers an important link between technological research and industry best practices, and covers various disciplinary areas such as manufacturing, healthcare and service engineering, among others.

Here at last is a major revision of a definitive reference on industrial engineering principles and practices. It includes these topics: the industrial function; industrial engineering in practice; methods engineering; work-measurement techniques; work-measurement application and control; incentive programs; manufacturing engineering; human factors, ergonomics, and human relations; economics and controls; facilities and material flow; mathematics and optimization techniques; and special industry applications. With 800 illustrations and an index.

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