
This book concentrates on real-world production scheduling in factories and industrial settings. It includes industry case studies that use innovative techniques as well as academic research results that can be used to improve production scheduling. Its purpose is to present scheduling principles, advanced tools, and examples of innovative scheduling systems to those who could use this information to improve their own production scheduling. However, the practical application of these modern scheduling and planning systems may be slow. Effective scheduling and planning systems could provide significant support, APS implementation numbers in these industries remain low. Therefore, based on an in-depth analysis of three sample fresh food industries (dairy, fresh and processed meat), the author evaluates what APS systems should offer in order to effectively support production planning and how the leading systems currently handle the most distinguishing characteristics of fresh food industries, the short product life cycle and the integrated setting of solving the optimization problems for each of the sample industries are proposed that allow to optimize the production of fresh foods with respect to shelf life. The book thereby offers valuable insights not only to researchers but also to software providers of APS systems and professionals from fresh food industries. This book presents a comprehensive overview of recent developments in production planning. The monograph begins with an introductory chapter reviewing the need for these production planning models, that operate by determining time-phased releases of work into the facility or supply chain, relating these to the Planning and Control (MPC) and Advanced Planning and Scheduling (APS) frameworks, that form the basis of most academic research and industrial practice. The extensive body of work on Workload Control is also placed in this context, and proves the need for improved models with a discussion of the difficulties, these approaches encounter. The next two chapters present a detailed review of the state of the art in optimization models based on exogenous planned lead times, and examines the cases where these can take both integer and fractional values. The difficulties arising in estimating planned lead times and behavior with random behavior with respect to these lead to non-convex optimization models. Noting that many of these difficulties by iterative multimodel approaches, that combine simulation and mathematical programming, are also discussed in detail. The next three chapters of the volume address the set of techniques developed using clearning functions, which represent the expected output of a resource in a planning period, as a function of the expected workload of the resource, during that period. The chapters on this subject propose a basic optimization model for multiple products, discuss the difficulties of this model and some possible solutions. It also reviews prior work, and discuss a number of alternative formulations of the clearing function concept with their respective advantages and disadvantages. Applications to lot sizing decisions and a number of other specific problems are also described. This volume concludes with an assessment of the state of the art described in the volume, and several directions for future work. This book presents a number of efficient techniques for solving large-scale production scheduling and planning problems in process industries. The main content is supplemented by a wealth of illustrations, while case studies on large-scale and industrial applications, ranging from continuous to semi-continuous and batch processes, round out the coverage. The book examines a variety of complex, real-world problems, and demonstrates solutions that are applicable to scenarios and countries around the world. Specifically, these case studies include: the production planning of the bottling stage of a major brewery at the Cervecería Cuauhtémoc Moctezuma (Heineken Int) in Mexico; the production scheduling for multi-stage semiconductor processes at an ice-cream production facility of Unilever in the Netherlands; the resource-constrained production planning for the yogurt production line at the KIRI dairy production facility in Greece; and the production scheduling for large-scale, multi-stage batch processes at a pharmaceutical batch plant in Germany. In addition, the book includes industrial-inspired case studies of: the simultaneous planning of production and logistics operations considering multi-site facilities for semiconductor processes; and the integrated planning of production and utility systems in process industries under uncertainty. Solving Large-scale Production Scheduling and Planning in the Process Industries offers a valuable reference guide for researchers and decision-makers alike, as it shows readers how to evaluate and improve existing installations, and how to design new ones. It is also well suited as a textbook for advanced courses on production scheduling and planning in industry, as it addresses the optimization of production and logistics operations in real-world process industries. In today’s complex business environment, engineering and management issues cannot be segmented. Integration of Industrial Management with the technicalities of engineering functions yields better results. In keeping with the needs of engineering degree and diploma students, Industrial Management studies the basic concepts of management and all other management-related aspects, which are considered valuable for engineering students. The book would certainly be an effective one in the coverage of its content, as it was developed browsing through the syllabuses of various universities and technical institutions both in India and abroad. USP. This book with its comprehensive coverage of topics, both practical and operational, would make the would-be engineers confident of taking significant workplace/management decisions, thus enhancing their employability. Production Planning and Control draws on practitioner experiences on the shop floor, covering everything a manufacturing or industrial engineer may need to know on the job. It covers the basic knowledge for the effective use of PP&C techniques and tools. It is written in an approachable style, thus making it ideal for readers with limited knowledge of production planning. Comprehensive coverage includes quality management, lean management, factory planning, and how they relate to PP&C. End of chapter questions help readers ensure they have grasped the most important concepts. With its focus on actionable knowledge and broad coverage of essential reference material, this is the ideal PP&C resource to accompany work, research or study. It uses practical examples from the industry to clearly illustrate the concepts presented. It provides a brief overview of the topics covered, and highlights the key points for each chapter. This book is designed to be a comprehensive resource for students and professionals in the field of production and operations management. It covers a wide range of topics, from basic principles to advanced techniques, and provides a clear and concise introduction to the field. The book is well-organized and easy to follow, with plenty of examples and case studies to help readers understand the concepts. Each chapter is divided into sections, with summaries at the end of each section and a comprehensive list of references for further reading. This book is an excellent resource for anyone interested in production and operations management, whether they are students or professionals in the field.
This comprehensive book gives a overview of the latest advances in genetic algorithms to solve engineering problems. It features real-world applications and an accompanying disk, giving the reader the opportunity to download demonstration programs and apply their own models to real problems and opportunities. Both process planning and scheduling are very important functions of manufacturing, which affect the cost to manufacture a product and the time to delivery. It this book contains various applications proposed by researchers to integrate the process planning and scheduling functions of manufacturing under varying configurations of shop. It is useful for both beginners and advanced researchers to understand and forecast Process Planning baselines more effectively. Features: Covers all the basics of both process planning and scheduling. Presents nonlinear approaches, closed-loop approaches, as well as distributed approaches Discuss the outlook of IPPS in Industry 4.0 paradigm Includes the benchmarking principles on IPPS Contains nature-algorithms and metaheuristics for performance measurements in IPPS. Presents analysis of energy-efficient objective for sustainable manufacturing in IPPS. This book presents a number of efficient techniques for solving large-scale production scheduling and planning problems in process industries. The main content is supplemented by a wealth of illustrations, while case studies cover the scheduling of some specific sectors, such as semiconductor, food, petrochemical and petrochemical processes, and water and oil pipelines. This book examines a variety of complex, real-world problems, and demonstrates solutions that are applicable to scenarios and countries around the world. Specifically, these case studies include: the production scheduling of the bottling stage of a major brewery at the Cervecería Cuauhtémoc Moctezuma (Heineken Int) in Mexico; the production scheduling for multi-stage semicontinuous processes at an ice-cream production facility of Unilever in the Netherlands; the resource-constrained production planning for the yogurt production line at the KIRI dairy production facility in Greece; and the production scheduling for large-scale, multi-stage batch processes at a pharmaceutical batch plant in Germany. In addition, the book includes industry-inspired case studies of: the simultaneous planning of production and logistics operations considering multi-site facilities for semicontinuous processes; and the integrated planning of production and utility systems in process industries under uncertainty. Solving Large-scale Production Scheduling and Planning in the Process Industries offers a valuable reference guide for researchers and decision-makers alike, as it shows how to evaluate and compare existing and new installations, and to design new systems, and how to apply the process planning and scheduling. It will also be a valuable resource for students at universities of applied sciences. This is a revision of a classic which integrates managerial issues and practical solutions, and expands the coverage of optimization methods. The book focusses on queuing and scheduling, and how to manage the quality of service for both production and logistics.
The third edition of this easy-to-follow handbook helps you understand the basic and more advanced concepts of master scheduling, from implementation to capacity planning to final assembly techniques. Packed with handy checklists and examples, Master Scheduling, Third Edition
delivers guidelines and techniques for a world-class master schedule in today's extremely competitive manufacturing market, effective production planning and scheduling processes are critical to streamlining production and increasing profits. Success in these areas means increased efficiency, capacity utilization, and reduced time required to complete jobs. From the initial stages of plant location and capacity determination to plant operations and manpower scheduling, Production Planning and Industrial Scheduling, Second Edition presents a cohesive outlook on optimization and planning. The author provides a focus on practical applications and integrates logistics and planning in the areas of production and scheduling. 

Critical Techniques for Optimizing Operational Productivity Starting with the strategic development of plant locations and capacities, the book lays out a clear process for creating an effective production plan with considerations for existing production facilities. It discusses forecasting and aggregate planning, which can predict demands under scenarios. In addition, the book introduces techniques to improve plant efficiencies in various areas, as well as material requirement and inventory and capacity planning. This expanded second edition features new information on safety stock determination, uncertainty in demand, and resource center capacity planning. The problem-specific case studies illustrate the effect of different procedures on the entire system and stress coordination between independent techniques to help achieve optimal efficiency. With the aid of this reference and the proper application of its concepts, industrial managers and engineers can reduce their manufacturing cost, succeed in fulfilling their customers' demands in a timely manner, and attain superior planning and overall control of manufacturing operations. The present book summarizes the achievements of the European FP7 project ARUM: Adaptive Production Management toward adaptive production planning and scheduling of highly complex and individualized products. This book also analyzes the application of cutting-edge emerging technologies in two use-cases: production planning and scheduling of the Airbus 350 fuselage assembling line (Airbus Industries) and the production planning of galley inserts (Iacobucci). This book is intended for production managers, application designers, engineers working in industry, as well as researchers and students in the fields of production management and engineering, and industrial automations and informatics. Copyright code : 7280517ebb0d181d9f0cd16eb3a21d1b