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Planning and scheduling in manufacturing and services. With CD-ROM. (English)

Springer Series in Operations Research. New York, NY: Springer. xvi, 506 p. EUR 59.95/net; sFr 106.00; £46.00; $ 69.95 (2005). [ISBN 0-387-22198-0/hbk]

The book can be seen as a considerably expanded and reorganized version of an earlier book "Operations Scheduling with Applications in Manufacturing and Services" written by the present author and *X. Chao* (McGraw Hill, 1999). The main emphasis of the book is on applications of various models that facilitate managerial decisions to be taken in production, transportation, information processing, sports, entertainment and many other areas. The book can serve as a text for university students in management science, logistics, industrial engineering and similar programmes. The style of the book helps readers with less numerate background to follow the material. The algorithms and techniques are explained by providing insight and illustration, rather than a rigorous theoretical multi-page proof. A practitioner can use the book to identify a solution technique and the corresponding software tool to tackle a real-life problem of his interest. A lecturer will find a relevant practical example to illustrate a mathematical algorithm she teaches. The book is composed of four parts and several appendices. Part 1 "Preliminaries" consists of three chapters. It introduces the main features of manufacturing and service models, including characteristics, constraints, performance measures and objectives. Part 2 "Planning and Scheduling in Manufacturing" consists of five chapters: on project planning and scheduling; on machine scheduling (job shop); on scheduling of flexible assembly systems; on economic lot scheduling and on planning and scheduling in supply chains. Part 3 "Planning and Scheduling in Services" consists of four chapters: on interval scheduling, reservations and timetabling; on scheduling and timetabling in sports and entertainment; on planning, scheduling and timetabling in transportation and on workforce scheduling. Part 4 "Systems Development and Implementation" consists of three chapters: on systems design and implementation; on advanced concepts in systems design and the final chapter on possible future developments. The appendices are concise reviews on mathematical programming (linear, nonlinear, integer, etc.), on exact optimization techniques (dynamic programming, branch-and-bound, etc.); on heuristic methods (dispatching rules, beam search, local search, genetic algorithms, etc.); on constraint programming. A short overview of various scheduling systems is given, while the LEKIN scheduling system is considered in more detail. The educational version of LEKIN and several other scheduling software systems are included on an accompanying CD. The disk also contains several pieces of optimization software, as well as a large collection of slides developed by both academics and practitioners.

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Classification :

*90B35 Scheduling theory

90-02 Research monographs (optimization)