

<<工厂物理学>>

图书基本信息

书名：<<工厂物理学>>

13位ISBN编号：9787302059738

10位ISBN编号：730205973X

出版时间：2002-11-1

出版时间：清华大学出版社

作者：（美）霍普（Wallace J. Hopp）;斯皮尔曼（Mark L. Spearman）

页数：698

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

## <<工厂物理学>>

### 前言

本教材系列的出版正值中国学术界工业工程学科经历巨大发展、实际工作中对工业工程的概念、方法和工具的使用兴趣日渐浓厚之时。

在实际工作中有效地应用工业工程的手段将无疑会提高生产率、工作质量、合作的满意度和效果。

该系列中的书籍对工业工程的本科生、研究生和工业界中需要解决工程系统设计、运作和管理诸方面问题的人士最为适用。

## <<工厂物理学>>

### 内容概要

《工厂物理学：制造企业管理基础》(第2版影印版)的作者是美国西北大学的W.J.Hopp教授和佐治亚理工学院的M.L.Spearman教授，是生产运作管理领域的知名学者，都是学物理出身，在多年实践经验和理论研究的基础上，以独特的视角与思维方式对发生在制造企业中的现象和本质进行了透彻的分析和系统的总结，以类似于物理学中定律定理的方式给出了准确的定性描述或定量计算公式。书中不仅对生产管理的发展历史和现状、取得的成就和问题等进行了精辟的总结和分析，而且紧密跟踪当前最先进的方法和技术，并预测了今后的发展趋势。

## 书籍目录

0 Factory Physics?0.1 The Short Answer0.2 The Long Answer0.2.1 Focus : Manufacturing Management0.2.2 Scope : Operations0.2.3 Method : Factory Physics0.2.4 Perspective : Flow Lines0.3 An Overview of the BookPART I THE LESSONS OF HISTORY1 Manufacturing in America1.1 Introduction1.2 The American Experience1.3 The First Industrial Revolution1.3.1 The Industrial Revolution in America1.3.2 The American System of Manufacturing1.4 The Second Industrial Revolution1.4.1 The Role of the Railroads1.4.2 Mass Retailers1.4.3 Andrew Carnegie and Scale1.4.4 Henry Ford and Speed1.5 Scientific Management1.5.1 Frederick W. Taylor1.5.2 Planning versus Doing1.5.3 Other Pioneers of Scientific Management1.5.4 The Science of Scientific Management1.6 The Rise of the Modern Manufacturing Organization1.6.1 Du Pont , Sloan , and Structure1.6.2 Hawthorne and the Human Element1.6.3 Management Education1.7 Peak , Decline , and Resurgence of American Manufacturing1.7.1 The Golden Era1.7.2 Accountants Count and Salesment Sell1.7.3 The Professional Manager1.7.4 Recovery and Globalization of Manufacturing1.8 The FutureDiscussion PointsStudy questions2 Inventory Control : From EOQ to ROP2.1 Introduction2.2 The Economic Order Quantity Model2.2.1 Motivation2.2.2 The Model2.2.3 The Key Insight of EOQ2.2.4 Sensitivity2.2.5 EOQ Extensions2.3 Dynamic Lot Sizing2.3.1 Motivation2.3.2 Problem Formulation2.3.3 The Wagner-Whitin Procedure2.3.4 Interpreting the Solution2.3.5 Caveats2.4 Statistical Inventory Models2.4.1 The News Vendor Model2.4.2 The Base Stock Model2.4.3 The Model2.5 ConclusionsAppendix 2A Basic ProbabilityAppendix 2B Inventory FormulasStudy QuestionsProblems3 The MRP Crusade3.1 Material Requirements Planning-MRP3.1.1 The Key Insight of MRP3.1.2 Overview of MRP3.1.3 MRP Inputs and Outputs3.1.4 The MRP Procedure3.1.5 Special Topics in MRP3.1.6 Lot Sizing in MRP3.1.7 Safety Stock and Safety Lead Times3.1.8 Accommodating Yield Losses3.1.9 Problems in MRP3.2 Manufacturing Resources Planning-MRP II3.2.1 The MRP II Hierarchy3.2.2 Long-Range Planning3.2.3 Intermediate Planning3.2.4 Short-Term Control3.3 Beyond MRP II-Enterprise Resources Planning3.3.1 History and Success of ERP3.3.2 An Example : SAP R/33.3.3 Manufacturing Execution Systems3.3.4 Advanced Planning Systems3.4 ConclusionsStudy QuestionsProblems4 The JIT Revolution4.1 The Origins of JIT4.2 JIT Goals4.3 The Environment as a Control4.4 Implementing JIT4.4.1 Production Smoothing4.4.2 Capacity Buffers4.4.3 Setup Reduction4.4.4 Cross-Training and Plant Layout4.4.5 Total Quality Management4.5 Kanban4.6 The Lessons of JITDiscussion PointStudy Questions5 What Went Wrong5.1 Introduction5.2 Trouble with Scientific Management5.3 Trouble with MRP5.4 Trouble with JIT5.5 Where from Here?Discussion PointsStudy QuestionsPART II FACTORY PHYSICS6 A Science of Manufacturing6.1 The Seeds of Science6.1.1 Why Science?6.1.2 Defining a Manufacturing System6.1.3 Prescriptive and Descriptive Models6.2 Objectives , Measures , and Controls6.2.1 The Systems Approach6.2.2 The Fundamental Objective6.2.3 Hierarchical Objectives6.2.4 Control and Information Systems6.3 Models and Performance Measures6.3.1 The Danger of Simple Models6.3.2 Building Better Prescriptive Models6.3.3 Accounting Models6.3.4 Tactical and Strategic Modeling6.3.5 Considering6.4 ConclusionsAppendix 6A Activity-Based CostingStudy QuestionsProblems7 Basic Factory Dynamics7.1 Introduction7.2 Definitions and Parameters7.2.1 Definitions7.2.2 Parameters7.2.3 Examples7.3 Simple Relationships7.3.1 Best-Case Performance7.3.2 Worst-Case Performance7.3.3 Practical Worst-Case Performance7.3.4 Bottleneck Pates and Cycle Time7.3.5 Internal Benchmarking7.4 Labor-Constrained Systems7.4.1 Ample Capacity Case7.4.2 Ful Flexibility Case7.4.3 CONWIP Lines with Flexible Labor7.5 ConclusionsStudy QuestionsProblemsIntuition-Building Exercises8 Variabiity Basics8.1 Introduction8.2 Variability and Randomness8.2.1 The Roots of Randomness8.2.2 Probabilistic Intuition8.3 Process Time Variability8.3.1 Measures and Classes of Varibability8.3.2 Low and Moderate Variability8.3.3 Highly Variable Process Times8.4 Causes of Variability8.4.1 Natural Variability8.4.2 Variability from Preemptive Outages(Breakdowns)8.4.3 Variability from Nonpreemptive Outages8.4.4 Variability from Recycle8.4.5 Summary of Variability Formulas8.5 Flow Variability8.5.1 Characterizing Variability in Flows8.5.2 Batch Arrivals and Departures8.6 Variability Interactions-Queueing8.6.1 Queueing Notation and Measures8.6.2 Fundamental Relations8.6.3 The M/M/1 Queue8.6.4 Performance Measures8.6.5 Systems with General Process

and Interarrival Times8.6.6 Parallel Machines8.6.7 Parallel Machines and General Times8.7 Effects of Blocking8.7.1 The M/M/1/b Queue8.7.2 General Blocking Models8.8 Variability Pooling8.8.1 Batch Processing8.8.2 Safety Stock Aggregation8.8.3 Queue Sharing8.9 ConclusionsStudy QuestionsProblems9 The Corrupting Influence of Variability9.1 Introduction9.1.1 Can Variability Be Good?9.1.2 Examples of Good and Bad Variability9.2 Performance and Variability9.2.1 Measures of Manufacturing Performance9.2.2 Variability Laws9.2.3 Buffering Examples9.2.4 Pay Me Now or Pay Me Later9.2.5 Flexibility9.2.6 Organizational Learning9.3 Flow Laws9.3.1 Product Flows9.3.2 Capacity9.3.3 Utilization9.3.4 Variability and Flow9.4 Batching Laws9.4.1 Types of Batches9.4.2 Process Batching9.4.3 Move Batching9.5 Cycle Time9.5.1 Cycle Time at a Single Station9.5.2 Assembly Operations9.5.3 Line Cycle Time9.5.4 Cycle Time , Lead Time , and Service9.6 Diagnostics and Improvement9.6.1 Increasing Throughput9.6.2 Reducing Cycle Time9.6.3 Improving Customer Service9.7 ConclusionsStudy QuestionsIntuition-Building ExercisesProblems10 Push and Pull Production Systems10.1 Introduction10.2 Definitions10.2.1 The Key Difference between Push and Pull10.2.2 The Push-Pull Interface10.3 The Magic of Pull10.3.1 Reducing Manufacturing Costs10.3.2 Reducing Variability10.3.3 Improving Quality10.3.4 Maintaining Flexibility10.3.5 Facilitating Work Ahead10.4 CONWIP10.4.1 Basic Mechanics10.4.2 Mean-Value Analysis Model10.5 Comparisons of CONWIP with MRP10.5.1 Observability10.5.2 Efficiency10.5.3 Variability10.5.4 Robustness10.6 Comparisons of CONWIP with Kanban10.6.1 Card Count Issues10.6.2 Product Mix Issues10.6.3 People Issues10.7 ConclusionsStudy QuestionProblems11 The Human Element in Operations Management11.1 Introduction11.2 Basic Human Laws11.2.1 The Foundation of Self-interest11.2.2 The Fact of Diversity11.2.3 The Power of Zealotry11.2.4 The Reality of Burnout11.3 Planning versus Motivating11.4 Responsibility and Authority11.5 SummaryDiscussion PointsStudy Questions12 Total Quality Manufacturing12.1 Introduction12.1.1 The Decade of Quality12.1.2 A quality anecdote12.1.3 The Status of Quality12.2 Views of Quality12.2.1 General Definitions12.2.2 Internal versus External Quality12.3 Statistical Quality Control12.3.1 SQC Approaches12.3.2 Statistical Process Control12.3.3 SPC Extensions12.4 Quality and Operations12.4.1 Quality Supports Operations12.4.2 Operations Supports Quality12.5 Quality and the Supply Chain12.5.1 A Safety Lead Time Example12.5.2 PurchasedPARTs in an Assembly System12.5.3 Vendor Selection and Management12.6 ConclusionsStudy QuestionsProblemsPART III PRINCIPLES IN PRACTICE13 A Pull Planning Framework13.1 Introduction13.2 Disaggregation13.2.1 Time Scales in Production Planning13.2.2 Other dimensions of Disaggregation13.2.3 Coordination13.3 Forecasting13.3.1 Causal Forecasting13.3.2 Time Series Forecasting13.3.3 The Art of Forecasting13.4 Planning for Pull13.5 Hierarchical Production Planning13.5.1 Capacity/Facility Planning13.5.2 Workforce Planning13.5.3 Aggregate Planning13.5.4 WIP and Quota Setting13.5.5 Demand Management13.5.6 Sequencing and Scheduling13.5.7 Shop Floor Control13.5.8 Real-Time Simulation13.5.9 Production Traching13.6 ConclusionsAppendix 13A A Quota-Setting ModelStudy QuestionsProblems14 Shop Floor Control14.1 Introduction14.2 General Considerations14.2.1 Gross Capacity Control14.2.2 Bottleneck Planning14.2.3 Span of Control14.3 CONWIP Configurations14.3.1 Basic CONWIP14.3.2 Tandem CONWIP Lines14.3.3 Shared Resources14.3.4 Multiple-Product Families14.3.5 CONWIP Assembly Lines14.4 Other Pull Mechanisms14.4.1 Kanban14.4.2 Pull-from-the-Bottleneck Methods14.4.3 Shop Floor Control and Scheduling14.5 Production Tracking14.5.1 Statistical Throughput Control14.5.2 Long-Range Capacity Tracking14.6 ConclusionsAppendix 14A Statistical Throughput ControlStudy QuestionsProblems15 Production Scheduling15.1 Goals of Production Scheduling15.1.1 Meeting Due Dates15.1.2 Maximizing Utilization15.1.3 Reducing WIP and Cycle Times15.2 Review of Scheduling Research15.2.1 MRP , MRP II , and ERP15.2.2 Classic Scheduling15.2.3 Dispatching15.2.4 Why Scheduling Is Hard15.2.5 Good News and Bad News15.2.6 Practical Finite-Capacity Scheduling15.3 Linking Planning and Scheduling15.3.1 Optimal Batching15.3.2 Due Date Quoting15.4 Bottleneck Scheduling15.4.1 CONWIP Lines Without Setups15.4.2 Single CONWIP Lines with Setups15.4.3 Bottleneck Scheduling Results15.5 Diagnostic Scheduling15.5.1 Types of Schedule Infeasibility15.5.2 Capacitated Material Requirements Planning-MRP-C15.5.3 Extending MRP-C to More General Environments15.5.4 Practical Issues15.6 Production Scheduling in a Pull Environment15.6.1 Schedule Planning , Pull Execution15.6.2 Using CONWIP with MRP15.7 ConclusionsStudy QuestionsProblems16 Aggregate and

Workforce Planning16.1 Introduction16.2 Basic Aggregate Planning16.2.1 A Simple Model16.2.2 An LP Example16.3 Product Mix Planning16.3.1 Basic Model16.3.2 A simple Example16.3.3 Extensions to the Basic Model16.4 Workforce Planning16.4.1 An LP Model16.4.2 A Combined AP/WP Example16.4.3 Modeling Insights16.5 ConclusionsAppendix 16A Linear ProgrammingStudy QuestionsProblems17 Supply Chain Management17.1 Introduction17.2 Reasons for Holding Inventory17.2.1 Raw Materials17.2.2 Work in Process17.2.3 Finished Goods Inventory17.2.4 Spare Parts17.3 Managing Raw Materials17.3.1 Visibility Improvements17.3.2 ABC Classification17.3.3 Just-in-Time17.3.4 Setting Safety Stock/Lead Times for Purchased Components17.3.5 Setting Order Frequencies for Purchased Components17.4 Managing WIP17.4.1 Reducing Queueing17.4.2 Reducing Wait-for-Batch WIP17.4.3 Reducing Wait-to-Match WIP17.5 Managing FGI17.6 Managing Spare Parts17.6.1 Stratifying Demand17.6.2 Stocking Spare Parts for Emergency Repairs17.7 Multiechelon Supply Chains17.7.1 System Configurations17.7.2 Performance Measures17.7.3 The Bullwhip Effect17.7.4 An Approximation for a Two-Level System17.8 ConclusionsDiscussion PointStudy QuestionsProblems18 Capacity Management18.1 The Capacity-Setting Problem18.1.1 Short-Term and Long-Term Capacity Setting18.1.2 Strategic Capacity Planning18.1.3 Traditional and Modern Views of Capacity Management18.2 Modeling and Analysis18.2.1 Example : A Minimum Cost , Capacity-Feasible Line18.2.2 Forcing Cycle Time Compliance18.3 Modifying Existing Production Lines18.4 Designing New Production Lines18.4.1 The Traditioinal Approach18.4.2 A Factory Physics Approach18.4.3 Other Facility Design Considerations18.5 Capacity Allocation and Line Balancing18.5.1 Paced Assembly Lines18.5.2 Unbalancing Flow Lines18.6 ConclusionsAppendix 18A The Line-of-Balance ProblemStudy QuestionsProblems19 Synthesis-Pulling It All Together19.1 The Strategic Importance of Details19.2 The Practical Matter of Implementation19.2.1 A Systems Perspective19.2.2 Initiating Change19.3 Focusing Teamwork19.3.1 Paretos Law19.3.2 Factory Physics Laws19.4 A Factory Physics Parable19.4.1 Hitting the Trail19.4.2 The Challenge19.4.3 The Lay of the Land19.4.4 Teamwork to the Rescue19.4.5 How the Plant Was Won19.4.6 Epilogue19.5 The FutureReferencesIndex

## <<工厂物理学>>

### 编辑推荐

《工厂物理学：制造企业管理基础》(第2版影印版)不同于一般的教科书，一方面涉猎范围极宽，广泛介绍了生产领域的概念、方法、技术及实践效果；另一方面对重点问题进行了极为深入细致的研究，探究了事物的本质，提出了独到的见解。

该书的起点较高，适合作为"生产系统"和"运作管理"方面的研究生课程的主教材。

对本科生教学，可以作为"生产运作管理"、"生产计划与控制"、"设施规划与物流分析"、"质量管理"等课程的主要参考书。

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>