

Automation Production Systems And Computer Integrated Manufacturing 4th Edition By Groover Mikell P 2014 Hardcover

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Automation Production Systems and Computer Integrated Manufacturing 4th Edition by Groover Mikell This comprehensive textbook now in its fourth edition offers a deep dive into the world of automation production systems and computer integrated manufacturing CIM Written by renowned authors Mikell P Groover and E Michael Mikell it provides a thorough understanding of the fundamental principles technologies and applications of these transformative fields Structure and Content The book is meticulously structured to guide readers through the evolution of manufacturing and its integration with modern technologies It covers a vast array of topics encompassing the theoretical underpinnings and practical applications of automation and CIM Heres a breakdown of the books structure Part I Foundations of Automation and Manufacturing Systems Chapter 1 to Automation and Manufacturing Systems Defines the key concepts of automation manufacturing and computer integrated manufacturing Explores the historical evolution of manufacturing systems and the driving forces behind their transformation Chapter 2 Production Systems and Their Design Discusses the different types of production systems including job shop batch repetitive and continuous flow Explores the key elements of production system design including layout material handling and capacity planning Chapter 3 Automation in Manufacturing Systems Introduces various types of automation such as fixed automation programmable automation and flexible automation 2 Explores the advantages and disadvantages of different

automation approaches Chapter 4 Work Measurement and Time Study Provides a comprehensive understanding of work measurement techniques including time study and predetermined time systems Emphasizes the importance of accurate time data for production planning and control Part II ComputerIntegrated Manufacturing CIM Chapter 5 ComputerIntegrated Manufacturing CIM Defines the concept of CIM and its role in integrating various manufacturing functions Discusses the different components of a CIM system including computeraided design CAD computeraided manufacturing CAM and enterprise resource planning ERP Chapter 6 ComputerAided Design CAD Explores the evolution and applications of CAD software in product design and development Discusses the various capabilities of CAD software including 2D and 3D modeling simulation and analysis Chapter 7 ComputerAided Manufacturing CAM Introduces the use of computers in manufacturing processes including CNC machining robotics and automated guided vehicles AGVs Examines the different types of CAM software and their applications Chapter 8 Enterprise Resource Planning ERP Discusses the importance of ERP systems in managing and integrating all aspects of a manufacturing enterprise Explains the key features of ERP systems including financial management supply chain management and customer relationship management Part III Automated Production Systems and Equipment Chapter 9 Materials Handling and Storage Systems Explores the different types of materials handling equipment including conveyors cranes and automated guided vehicles AGVs Discusses the design and optimization of material handling systems Chapter 10 Robotics Introduces the concept of industrial robots and their applications in manufacturing Explains different types of robots including articulated robots SCARA robots and Cartesian robots Chapter 11 Automated Guided Vehicles AGVs Discusses the use of AGVs in material transportation and their integration with other automation systems 3 Examines the advantages and limitations of AGVs Chapter 12 Flexible Manufacturing Systems FMS Explores the concept of FMS and its ability to adapt to changing production requirements Discusses the key components of an FMS including CNC machines robots and automated guided vehicles Part IV Advanced Automation and Manufacturing Technologies Chapter 13 Computer Vision Introduces the use

of computer vision in automation quality inspection and robot guidance Explains different computer vision techniques including image processing pattern recognition and machine learning Chapter 14 SensorBased Systems Discusses the role of sensors in monitoring and controlling manufacturing processes Explores different types of sensors including proximity sensors pressure sensors and temperature sensors Chapter 15 Artificial Intelligence AI and Machine Learning ML Introduces the application of AI and ML in manufacturing including process optimization predictive maintenance and quality control Examines different AI and ML techniques including neural networks fuzzy logic and genetic algorithms Chapter 16 Lean Manufacturing Explores the principles of lean manufacturing and its application in reducing waste and improving efficiency Discusses different lean tools and techniques such as value stream mapping 5S and pull production Part V Implementation and Management of Automation and CIM Chapter 17 Implementing Automation and CIM Provides practical guidance on the implementation of automation and CIM systems Discusses the key considerations for successful implementation including project planning risk assessment and change management Chapter 18 Managing Automation and CIM Focuses on the ongoing management of automation and CIM systems Explores the importance of maintenance training and continuous improvement Chapter 19 The Future of Automation and CIM Discusses the future trends in automation and CIM including the role of Industry 4.0 artificial intelligence and the internet of things 4 Key Features Comprehensive Coverage The book provides a thorough overview of the key concepts technologies and applications of automation production systems and CIM Clear and Concise Writing The authors utilize clear and concise language making the complex topics accessible to a wide audience Numerous Examples and Case Studies Realworld examples and case studies illustrate the practical applications of the concepts discussed Emphasis on ProblemSolving The book encourages critical thinking and problemsolving through numerous exercises and projects UpToDate Information The fourth edition includes the latest developments and advancements in automation and CIM technologies Supportive Website An accompanying website offers supplementary materials including instructors resources student solutions and interactive simulations Target Audience

This book is an indispensable resource for students professionals and researchers in various fields including Manufacturing Engineering Industrial Engineering Mechanical Engineering Computer Science Business Administration Operations Management Conclusion Automation Production Systems and Computer Integrated Manufacturing 4th Edition by Groover Mikell is an essential guide to understanding the principles technologies and applications of automation and CIM Its comprehensive coverage clear writing style and numerous examples make it a valuable resource for anyone interested in this rapidly evolving field Whether youre a student seeking a strong foundation or a professional seeking to stay ahead of the curve this book provides the knowledge and insights you need to succeed 5

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this book takes a modern all inclusive look at manufacturing processes its coverage is strategically divided 65 concerned with manufacturing process technologies 35 dealing with engineering materials and production systems

fundamentals of modern manufacturing is designed for a first course or two course sequence in manufacturing at the junior level in mechanical industrial and manufacturing engineering curricula given its coverage of engineering materials it may also be suitable for materials science and engineering courses that emphasize materials processing finally it may be appropriate for technology programs related to the preceding engineering disciplines most of the book s content is concerned with manufacturing processes about 65 of the text but it also provides significant coverage of engineering materials and production systems materials processes and systems are the basic building blocks of modern manufacturing and the three broad subject

areas covered in the book

this exploration of the technical and engineering aspects of automated production systems provides a comprehensive and balanced coverage of the subject it covers cutting edge technologies of production automation and material handling and how these technologies are used to construct modern manufacturing systems

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