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Manufacturing Automation

Metal Cutting Mechanics, Machine Tool Vibrations, and CNC Design

Cambridge University Press **Metal cutting is a widely used method of producing manufactured products. The technology of metal cutting has advanced considerably along with new materials, computers, and sensors. This new edition treats the scientific principles of metal cutting and their practical application to manufacturing problems. It begins with metal cutting mechanics, principles of vibration, and experimental modal analysis applied to solving shop floor problems.**

Notable is the in-depth coverage of chatter vibrations, a problem experienced daily by manufacturing engineers. The essential topics of programming, design, and automation of CNC (computer numerical control) machine tools, NC (numerical control) programming, and CAD/CAM technology are discussed. The text also covers the selection of drive actuators, feedback sensors, modeling and control of feed drives, the design of real time trajectory generation and interpolation algorithms, and CNC-oriented error analysis in detail. Each chapter includes examples drawn from industry, design projects, and homework problems. This book is ideal for advanced undergraduate and graduate students, as well as practicing engineers.

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Manufacturing Automation

Metal Cutting Mechanics, Machine Tool Vibrations, and CNC Design

Cambridge University Press **A professional reference and textbook on metal cutting, considering scientific principles and their practical application to manufacturing problems.**

Fundamentals of Metal Machining and Machine Tools

CRC Press **In the more than 15 years since the second edition of Fundamentals of Machining and Machine Tools was published, the industry has seen many changes. Students must keep up with developments in analytical modeling of machining processes, modern cutting tool materials, and how these changes affect the economics of machining. With coverage reflecting s**

MANUFACTURING PROCESSES

PHI Learning Pvt. Ltd. **The revised and updated second edition of this book gives an in-depth presentation of the basic principles and operational procedures of general manufacturing processes. It aims at assisting the students in developing an understanding of the important and often complex interrelationship among various technical and economical factors involved in manufacturing. The book begins with a discussion on material properties while laying emphasis on the influence of materials and processing parameters in understanding manufacturing processes and operations. This is followed by a detailed description of various manufacturing processes commonly used in the industry. With several revisions and the addition of four new chapters, the new edition also includes a detailed discussion on mechanics of metal cutting, features and working of machine tools, design of molds and gating systems for proper filling and cooling of castings. Besides, the new edition provides the basics of solid-state welding processes,**

weldability, heat in welding, residual stresses and testing of weldments and also of non-conventional machining methods, automation and transfer machining, machining centres, robotics, manufacturing of gears, threads and jigs and fixtures. The book is intended for undergraduate students of mechanical engineering, production engineering and industrial engineering. The diploma students and those preparing for AMIE, Indian Engineering Services and other competitive examinations will also find the book highly useful. New to This Edition : Includes four new chapters Non-conventional Machining Methods; Automation: Transfer Machining, Machining Centres and Robotics; Manufacturing Gears and Threads; and Jigs and Fixtures to meet the course requirements. Offers a good number of worked-out examples to help the students in mastering the concepts of the various manufacturing processes. Provides objective-type questions drawn from various competitive examinations such as Indian Engineering Services and GATE.

Advanced Machining Processes of Metallic Materials

Theory, Modelling, and Applications

Elsevier Advanced Machining Processes of Metallic Materials: Theory, Modelling and Applications, Second Edition, explores the metal cutting processes with regard to theory and industrial practice. Structured into three parts, the first section provides information on the fundamentals of machining, while the second and third parts include an overview of the effects of the theoretical and experimental considerations in high-level machining technology and a summary of production outputs related to part quality. In particular, topics discussed include: modern tool materials, mechanical, thermal and tribological aspects of machining, computer simulation of various process phenomena, chip control, monitoring of the cutting state, progressive and hybrid machining operations, as well as practical ways for improving machinability and generation and modeling of surface integrity. This new edition addresses the present state and future development of machining technologies, and includes expanded coverage on machining operations, such as turning, milling, drilling, and broaching, as well as a new chapter on sustainable machining processes. In addition, the book provides a comprehensive description of metal cutting theory and experimental and modeling techniques, along with basic machining processes and their effective use in a wide range of manufacturing applications. The research covered here has contributed to a more generalized vision of machining technology, including not only traditional manufacturing tasks, but also potential (emerging) new applications, such as micro and

nanotechnology. Includes new case studies illuminate experimental methods and outputs from different sectors of the manufacturing industry Presents metal cutting processes that would be applicable for various technical, engineering, and scientific levels Includes an updated knowledge of standards, cutting tool materials and tools, new machining technologies, relevant machinability records, optimization techniques, and surface integrity

Metal Cutting Technologies

Progress and Current Trends

Walter de Gruyter GmbH & Co KG Metal cutting is a science and technology of great interest for several important industries, such as automotive, aeronautics, aerospace, moulds and dies, biomedicine, etc. Metal cutting is a manufacturing process in which parts are shaped by removal of unwanted material. The interest for this topic increased over the last twenty years, with rapid advances in materials science, automation and control, and computers technology. The present volume aims to provide research developments in metal cutting for modern industry. This volume can be used by students, academics, researchers, and engineering professionals in mechanical, manufacturing, and materials industries. **THE SERIES: ADVANCED MECHANICAL ENGINEERING** Currently, it is possible to define mechanical engineering as the branch of engineering that “involves the application of principles of physics and engineering for the design, manufacturing, automation and maintenance of mechanical systems”. Mechanical Engineering is closely related to a number of other engineering disciplines. This series fosters information exchange and discussion on all aspects of mechanical engineering with a special emphasis on research and development from a number of perspectives including (but not limited to) materials and manufacturing processes, machining and machine tools, tribology and surface engineering, structural mechanics, applied and computational mechanics, mechanical design, mechatronics and robotics, fluid mechanics and heat transfer, renewable energies, biomechanics, nanoengineering and nanomechanics. In addition, the series covers the full range of sustainability aspects related with mechanical engineering. **Advanced Mechanical Engineering** is an essential reference for students, academics, researchers, materials, mechanical and manufacturing engineers and professionals in mechanical engineering.

Design Principles of Metal-Cutting Machine Tools

Elsevier **Design Principles of Metal-Cutting Machine Tools** discusses the fundamentals aspects of machine tool design. The book covers the design consideration of metal-cutting machine, such as static and dynamic stiffness, operational speeds, gearboxes, manual, and automatic control. The text first details the data calculation and the general requirements of the machine tool. Next, the book discusses the design principles, which include stiffness and rigidity of the separate constructional elements and their combined behavior under load, as well as electrical, mechanical, and hydraulic drives for the operational movements. The next section deals with automatic control, including its principles, constructional elements, and applications. The last section tackles the design of constructional elements, such as machine tool structures, spindles and spindle bearings, and control and operating devices. The book will be of great use to mechanical and manufacturing engineers. Individuals involved in materials manufacturing industry will also benefit from the book.

Analysis of Machining and Machine Tools

Springer This book provides readers with the fundamental, analytical, and quantitative knowledge of machining process planning and optimization based on advanced and practical understanding of machinery, mechanics, accuracy, dynamics, monitoring techniques, and control strategies that they need to understanding machining and machine tools. It is written for first-year graduate students in mechanical engineering, and is also appropriate for use as a reference book by practicing engineers. It covers topics such as single and multiple point cutting processes; grinding processes; machine tool components, accuracy, and metrology; shear stress in cutting, cutting temperature and thermal analysis, and machine tool chatter. The second section of the book is devoted to “Non-Traditional Machining,” where readers can find chapters on electrical discharge machining, electrochemical machining, laser and electron beam machining, and biomedical machining. Examples of realistic problems that engineers are likely to face in the field are included, along with solutions and explanations that foster a didactic learning experience.

Fundamentals of Machining and Machine Tools

I. K. International Pvt Ltd **The book thoroughly illustrates the causes of various phenomena and their effects on machining practice. It includes description of machining processes outlining the merits and de-merits of various modeling approaches. Spread in 22 chapters, the book is broadly divided in four sections: 1. Machining Processes 2. Cutting Tools 3. Machine Tools 4. Automation Data on cutting parameters for machining operations and main characteristics of machine tools have been separately provided in Annexures. In addition to exhaustive theory, a number of numerical examples have been solved and arranged in various chapters. Question bank has been given at the end of every chapter. The book is a must for anyone involved in metal cutting, machining, machine tool technology, machining applications, and manufacturing processes**

Work Study and Ergonomics

Metal Machining

Theory and Applications

Butterworth-Heinemann **Metal machining is the most widespread metal-shaping process in the mechanical manufacturing industry. World-wide investment in metal machining tools increases year on year - and the wealth of nations can be judged by it. This text - the most up-to-date in the field - provides in-depth discussion of the theory and application of metal machining at an advanced level. It begins with an overview of the development of metal machining and its role in the current industrial environment and continues with a discussion of the theory and practice of machining. The underlying mechanics are analysed in detail and there are extensive chapters examining applications through a discussion of simulation and process control. "Metal Machining: Theory and Applications" is essential reading for senior undergraduates and postgraduates specialising in cutting technology. It is also an invaluable reference tool for professional engineers. Professors Childs, Maekawa, Obikawa and Yamane are four of the leading authorities on metal machining and have worked together for many years. Of interest to all mechanical, manufacturing and materials**

engineers Theoretical and practical problems addressed

Parallel Robotic Machine Tools

Springer Science & Business Media Research and development of various parallel mechanism applications in engineering are now being performed more and more actively in every industrial field. Parallel robot based machine tools development is considered a key technology of robot applications in manufacturing industries. The material covered here describes the basic theory, approaches, and algorithms in the field of parallel robot based machine tools. In addition families of new alternative mechanical architectures which can be used for machine tools with parallel architecture are introduced. Given equal importance is the design of mechanism systems such as kinematic analysis, stiffness analysis, kinetostatic modeling, and optimization.

Metal Cutting and High Speed Machining

Springer 3rd international conference on metal cutting and high speed machining.

Manufacturing Automation, Second Edition

Metal cutting is widely used in producing manufactured products. The technology has advanced considerably along with new materials, computers and sensors. This new edition considers the scientific principles of metal cutting and their practical application to manufacturing problems. It begins with metal cutting mechanics, principles of vibration and experimental modal analysis applied to solving shop floor problems. There is in-depth coverage of chatter vibrations, a problem experienced daily by manufacturing engineers. Programming, design and automation of CNC (computer numerical control) machine tools, NC (numerical control) programming and CAD/CAM technology are discussed. The text also covers the selection of drive actuators, feedback sensors, modelling and control of feed drives, the design of real time trajectory generation and interpolation algorithms and CNC-oriented error analysis in detail. Each chapter includes examples drawn from industry, design projects and homework problems. This is ideal for advanced undergraduate and graduate students and also practising engineers.

Handbook of Manufacturing Engineering and Technology

Springer The Springer Reference Work Handbook of Manufacturing Engineering and Technology provides overviews and in-depth and authoritative analyses on the basic and cutting-edge manufacturing technologies and sciences across a broad spectrum of areas. These topics are commonly encountered in industries as well as in academia. Manufacturing engineering curricula across universities are now essential topics covered in major universities worldwide.

Machine Tool Structures

Elsevier Machine Tool Structures, Volume 1 deals with fundamental theories and calculation methods for machine tool structures. Experimental investigations into stiffness are discussed, along with the application of the results to the design of machine tool structures. Topics covered range from static and dynamic stiffness to chatter in metal cutting, stability in machine tools, and deformations of machine tool structures. This volume is divided into three sections and opens with a discussion on stiffness specifications and the effect of stiffness on the behavior of the machine under forced vibration conditions. The following chapters explore the stability of the machine structure against chatter; methods of stability analysis; tests and principles of dampers; chatter during grinding operations; and stresses and deformations of closed box structures subjected to bending and shear. Calculation methods for determining stiffness constants of a structure's individual parts, as well as methods for determining the resulting stiffnesses, modal shapes, and their parameters, are also described. The final chapter presents systematic procedures for the analysis of machine tool structures. This book is intended for university students, research workers, and designers.

Occupational Outlook Handbook

Metal Forming

Mechanics and Metallurgy

Cambridge University Press **This book helps the engineer understand the principles of metal forming and analyze forming problems - both the mechanics of forming processes and how the properties of metals interact with the processes. In this fourth edition, an entire chapter has been devoted to forming limit diagrams and various aspects of stamping and another on other sheet forming operations. Sheet testing is covered in a separate chapter. Coverage of sheet metal properties has been expanded. Interesting end-of-chapter notes have been added throughout, as well as references. More than 200 end-of-chapter problems are also included.**

Workshop Processes, Practices and Materials

Routledge **Workshop Processes, Practices and Materials is an ideal introduction to workshop processes, practices and materials for entry-level engineers and workshop technicians. With detailed illustrations throughout and simple, clear language, this is a practical introduction to what can be a very complex subject. It has been significantly updated and revised to include new material on adhesives, protective coatings, plastics and current Health and Safety legislation. It covers all the standard topics, including safe practices, measuring equipment, hand and machine tools, materials and joining methods, making it an indispensable handbook for use both in class and the workshop. Its broad coverage makes it a useful reference book for many different courses worldwide.**

Finite Element Method in Machining Processes

Springer Science & Business Media **Finite Element Method in Machining Processes provides a concise study on the way the Finite Element Method (FEM) is used in the case of manufacturing processes, primarily in machining. The basics of this kind of modeling are detailed to create a reference that will provide guidelines for those who start to study this method now, but also for scientists already involved in FEM and want to expand their research. A discussion on FEM, formulations, and techniques currently in use is followed up by machining case studies. Orthogonal cutting, oblique cutting, 3D simulations for turning and milling, grinding, and state-of-the-art topics such as high speed machining and micromachining are explained with relevant examples. This is all supported by a literature review and a reference list**

for further study. As FEM is a key method for researchers in the manufacturing and especially in the machining sector, Finite Element Method in Machining Processes is a key reference for students studying manufacturing processes but also for industry professionals.

Metal Cutting Mechanics

CRC Press **Metal Cutting Mechanics** outlines the fundamentals of metal cutting analysis, reducing the extent of empirical approaches to the problems as well as bridging the gap between design and manufacture. The author distinguishes his work from other works through these aspects: considering the system engineering of the cutting process identifying the singularity of the cutting process among other closely related manufacturing processes by chip formation, caused by bending and shear stresses in the deformation zone suggesting a distinctive way toward predictability of the metal cutting process devoting special attention to experimental methodology **Metal Cutting Mechanics** provides an exceptional balance between general reading and research analysis, presenting industrial and academic requirements in terms of basic scientific factors as well as application potential.

Semi-Discretization for Time-Delay Systems

Stability and Engineering Applications

Springer Science & Business Media **This book** presents the recently introduced and already widely referred semi-discretization method for the stability analysis of delayed dynamical systems. Delay differential equations often come up in different fields of engineering, like feedback control systems, machine tool vibrations, balancing/stabilization with reflex delay. The behavior of such systems is often counter-intuitive and closed form analytical formulas can rarely be given even for the linear stability conditions. If parametric excitation is coupled with the delay effect, then the governing equation is a delay differential equation with time periodic coefficients, and the stability properties are even more intriguing. The semi-discretization method is a simple but efficient method that is based on the discretization with respect to the delayed term and the periodic coefficients only. The method can effectively be used to construct stability diagrams in the space of system parameters.

Mechatronic Systems 2

Applications in Material Handling Processes and Robotics

Routledge **The second volume of the series is devoted to applications of mechatronics in material processing and robotics. Both classical machining methods, such as extrusion, forging and milling, and modern ones, such as plasma and ultrasonic machining, are analyzed. An extensive part covers the modeling of these processes, also from a phenomenological point of view. The study analyzes the issues related to robotics in various technological processes as well.**

Sectoral Systems of Innovation

Concepts, Issues and Analyses of Six Major Sectors in Europe

Cambridge University Press **Innovation and technological change show different rates, types and trajectories depending on the sector in which they take place. Agents and institutions of a sector all exert a major influence on innovation. With contributions from nineteen experts in their field, this book proposes the framework of the 'sectoral systems of innovation' to analyse the innovation process, the factors affecting innovation, the relationship between innovation and industry dynamics, the changing boundaries and transformation of sectors, and the determinants of the international performance of firms and countries in different sectors. Innovation in a sector is considered to be affected by three groups of variables: knowledge and technologies; actors and networks; and institutions. In addition to the general framework, this book examines innovation in six major sectors in Europe including pharmaceuticals and biotechnology, telecommunications equipment and services, chemicals, software, machine tools and services.**

Computerized Manufacturing Automation
Employment, Education, and the Workplace
Advances on Mechanics, Design Engineering and
Manufacturing
Proceedings of the International Joint Conference on
Mechanics, Design Engineering & Advanced
Manufacturing (JCM 2016), 14-16 September, 2016,
Catania, Italy

Springer This book gathers papers presented at the International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing (JCM 2016), held on 14-16 September, 2016, in Catania, Italy. It reports on cutting-edge topics in product design and manufacturing, such as industrial methods for integrated product and process design; innovative design; and computer-aided design. Further topics covered include virtual simulation and reverse engineering; additive manufacturing; product manufacturing; engineering methods in medicine and education; representation techniques; and nautical, aeronautics and aerospace design and modeling. The book is divided into eight main sections, reflecting the focus and primary themes of the conference. The contributions presented here will not only provide researchers, engineers and experts in a range of industrial engineering subfields with extensive

information to support their daily work; they are also intended to stimulate new research directions, advanced applications of the methods discussed, and future interdisciplinary collaborations.

Machine Tools for High Performance Machining

Springer Science & Business Media **Machine tools are the main production factor for many industrial applications in many important sectors. Recent developments in new motion devices and numerical control have led to considerable technological improvements in machine tools. The use of five-axis machining centers has also spread, resulting in reductions in set-up and lead times. As a consequence, feed rates, cutting speed and chip section increased, whilst accuracy and precision have improved as well. Additionally, new cutting tools have been developed, combining tough substrates, optimal geometries and wear resistant coatings. “Machine Tools for High Performance Machining” describes in depth several aspects of machine structures, machine elements and control, and application. The basics, models and functions of each aspect are explained by experts from both academia and industry. Postgraduates, researchers and end users will all find this book an essential reference.**

Advanced Design and Manufacturing Based on STEP

Springer Science & Business Media **Design and manufacturing is the essential element in any product development lifecycle. Industry vendors and users have been seeking a common language to be used for the entire product development lifecycle that can describe design, manufacturing and other data pertaining to the product. Many solutions were proposed, the most successful being the Standard for Exchange of Product model (STEP). STEP provides a mechanism that is capable of describing product data, independent from any particular system. The nature of this description makes it suitable not only for neutral file exchange, but also as a basis for implementing, sharing and archiving product databases. ISO 10303-AP203 is the first and perhaps the most successful AP developed to exchange design data between different CAD systems. Going from geometric data (as in AP203) to features (as in AP224) represents an important step towards having the right type of data in a STEP-based CAD/CAM system. Of particular significance is the publication of STEP-NC, as an extension of STEP to NC, utilising feature-based concepts for CNC machining purposes. The aim of this book is to provide a snapshot of the recent research outcomes and implementation cases in the field of design and manufacturing where STEP is used as the primary data representation**

protocol. The 20 chapters are contributed by authors from most of the top research teams in the world. These research teams are based in national research institutes, industries as well as universities.

Machining of Hard Materials

Springer Science & Business Media **Hard machining is a relatively recent technology that can be defined as a machining operation, using tools with geometrically defined cutting edges, of a work piece that has hardness values typically in the 45-70HRC range. This operation always presents the challenge of selecting a cutting tool insert that facilitates high-precision machining of the component, but it presents several advantages when compared with the traditional methodology based in finish grinding operations after heat treatment of work pieces. Machining of Hard Materials aims to provide the reader with the fundamentals and recent advances in the field of hard machining of materials. All the chapters are written by international experts in this important field of research. They cover topics such as: • advanced cutting tools for the machining of hard materials; • the mechanics of cutting and chip formation; • surface integrity; • modelling and simulation; and • computational methods and optimization. Machining of Hard Materials can serve as a useful reference for academics, manufacturing and materials researchers, manufacturing and mechanical engineers, and professionals in machining and related industries. It can also be used as a text for advanced undergraduate or postgraduate students studying mechanical engineering, manufacturing, or materials.**

Principles and Applications of Metal Rolling

Cambridge University Press **Rolling is an important metal forming process which involves the passing of metal stock through a pair of rollers. It is categorized depending on the recrystallization temperature of the metal rolled. This book covers the entire gamut of rolling technology in one volume. It begins with a brief history of rolling, and goes on to discuss different rolling processes, the deformation of materials, and the classification of rolling mills and stands. The book discusses rolling applications of steel blooms, slabs, bars, plates, rods, heavy sections and non-ferrous metals in detail. It covers important rolling process parameters, including rolling friction, stress and strain across rolled strip thickness, rolling torque and power and roll separation force. It also provides details on the design and applications of various rolling equipment, including mill rolls, neck bearings, spindles, coilers and decoilers.**

Introduction to Operational Modal Analysis

John Wiley & Sons **Comprehensively covers the basic principles and practice of Operational Modal Analysis (OMA). Covers all important aspects that are needed to understand why OMA is a practical tool for modal testing Covers advanced topics, including closely spaced modes, mode shape scaling, mode shape expansion and estimation of stress and strain in operational responses Discusses practical applications of Operational Modal Analysis Includes examples supported by MATLAB® applications Accompanied by a website hosting a MATLAB® toolbox for Operational Modal Analysis.**

Process Machine Interactions

Prediction and Manipulation of Interactions between Manufacturing Processes and Machine Tool Structures

Springer Science & Business Media **This contributed volume collects the scientific results of the DFG Priority Program 1180 Prediction and Manipulation of the Interactions between Structures and Processes. The research program has been conducted during the years 2005 and 2011, whereas the primary goal was the analysis of the interactions between processes and structures in modern production facilities. This book presents the findings of the 20 interdisciplinary subprojects, focusing on different manufacturing processes such as high performance milling, tool grinding or metal forming. It contains experimental investigations as well as mathematical modeling of production processes and machine interactions. New experimental advancements and novel simulation approaches are also included.**

Manufacturing Automation

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mechanics, principles of vibration, and experimental modal analysis applied to solving shop floor problems. Notable is the in-depth coverage of chatter vibrations, a problem experienced daily by manufacturing engineers. The essential topics of programming, design, and automation of CNC (computer numerical control) machine tools, NC (numerical control) programming, and CAD/CAM technology are discussed. The text also covers the selection of drive actuators, feedback sensors, modeling and control of feed drives, the design of real time trajectory generation and interpolation algorithms, and CNC-oriented error analysis in detail. Each chapter includes examples drawn from industry, design projects, and homework problems. This book is ideal for advanced undergraduate and graduate students, as well as practicing engineers.

Machine Tool Metrology

An Industrial Handbook

Springer Maximizing reader insights into the key scientific disciplines of Machine Tool Metrology, this text will prove useful for the industrial-practitioner and those interested in the operation of machine tools. Within this current level of industrial-content, this book incorporates significant usage of the existing published literature and valid information obtained from a wide-spectrum of manufacturers of plant, equipment and instrumentation before putting forward novel ideas and methodologies. Providing easy to understand bullet points and lucid descriptions of metrological and calibration subjects, this book aids reader understanding of the topics discussed whilst adding a voluminous-amount of footnotes utilised throughout all of the chapters, which adds some additional detail to the subject. Featuring an extensive amount of photographic-support, this book will serve as a key reference text for all those involved in the field.

Cutting Tool Applications

Forces of Production

A Social History of Industrial Automation

Routledge Focusing on the design and implementation of computer-based automatic machine tools, David F. Noble challenges the idea that technology has a life of its own. Technology has been both a convenient scapegoat and a universal solution, serving to disarm critics, divert attention, depoliticize debate, and dismiss discussion of the fundamental antagonisms and inequalities that continue to beset America. This provocative study of the postwar automation of the American metal-working industry—the heart of a modern industrial economy—explains how dominant institutions like the great corporations, the universities, and the military, along with the ideology of modern engineering shape, the development of technology. Noble shows how the system of "numerical control," perfected at the Massachusetts Institute of Technology (MIT) and put into general industrial use, was chosen over competing systems for reasons other than the technical and economic superiority typically advanced by its promoters. Numerical control took shape at an MIT laboratory rather than in a manufacturing setting, and a market for the new technology was created, not by cost-minded producers, but instead by the U. S. Air Force. Competing methods, equally promising, were rejected because they left control of production in the hands of skilled workers, rather than in those of management or programmers. Noble demonstrates that engineering design is influenced by political, economic, managerial, and sociological considerations, while the deployment of equipment—illustrated by a detailed case history of a large General Electric plant in Massachusetts—can become entangled with such matters as labor classification, shop organization, managerial responsibility, and patterns of authority. In its examination of technology as a human, social process, *Forces of Production* is a path-breaking contribution to the understanding of this phenomenon in American society.

Robotics in Smart Manufacturing

International Workshop, WRSM 2013, Co-located with FAIM 2013, Porto, Portugal, June 26-28, 2013.

Proceedings

Springer This book constitutes the refereed proceedings of the International Workshop on Robotics in Smart Manufacturing, WRSM 2013, held in Porto, Portugal, in June 2013. The 20 revised full papers presented were carefully reviewed and selected from numerous submissions. The papers address issues such as robotic machining, off-line robot programming, robot calibration, new robotic hardware and software architectures, advanced robot teaching methods, intelligent warehouses, robot co-workers and application of robots in the textile industry.

The 48 Laws of Power in Practice

The 3 Most Powerful Laws & The 4 Indispensable Power Principles

tradition Robert Greene's *The 48 Laws of Power* has shaken up the lives of millions. It's wielded by successful business executives, leading actors and musicians, and even by criminal kingpins. But how can you apply its lessons to your life? Perhaps you want to become a modern Machiavelli. Perhaps you want to escape the daily grind and realise your true potential and your dreams. Or maybe you're just tired of finding yourself the victim of other people's games. But with 48 Laws to choose from and a strong possibility that any one of them might seem like a radical overhaul of your habits and thought processes, it can seem overwhelming or impossible to put the Laws into practice. Help is at hand. Drawing on our major podcast series, *Exploring The 48 Laws of Power*, this book provides all you need to put the Laws into practice and make lasting changes to your life. We reveal the 3 Most Powerful Laws (the ones you should start with,

and on which all the others build) and the 4 Indispensable Power Principles (the specific rules of thumb and social 'hacks' which explain how the Laws really work in the world today). Armed with this knowledge, The 48 Laws of Power won't be a cool book you glanced through and then shelved. It will change your life.

Preparation and Characterization of Materials

Elsevier **Preparation and Characterization of Materials** brings together the proceedings of the Indo-U.S. Workshop on the Preparation and Characterization of Materials, held on February 19-23, 1981, at the Indian Institute of Science in Bangalore, India. The papers focus on advances and developments in the preparation and characterization of materials such as ferroics, layered materials, metal oxides and other electronic materials, amorphous materials including glasses, and high-temperature ceramics. This book is comprised of 25 chapters and begins with a discussion on crystal growth and other preparation techniques, touching on topics such as solid state synthesis of complex oxides and preparation of soft ferrites. The application of neutron scattering techniques and analytical electron microscopy to materials research and materials science is then considered, along with the dielectric and electro-optic applications of ferroics and the preparation and characterization of synthetic layered inorganic ion exchangers. Subsequent chapters deal with metal oxides and other electronic materials; glasses and other amorphous materials; and high-temperature ceramics such as silicon nitride. This monograph will be of interest to materials scientists and engineers as well as students and researchers in materials science.