

Product Design And Manufacturing By R C Gupta A K Chitale

This well-established and widely adopted text, now in its Sixth Edition, continues to provide a comprehensive coverage of the morphology of the design process. It gives a holistic view of product design, which has inputs from diverse fields such as aesthetics, strength analysis, production design, ergonomics, reliability and quality, Taguchi methods and quality with six sigma, and computer applications. The text discusses the importance and objectives of design for environment and describes the various approaches by which a modern, environment-conscious designer goes about the task of design for environment. Many examples have been provided to illustrate the concepts discussed. In this sixth edition, three appendices have been added. Appendix A deals with limits, fits and tolerance along with their applications. Appendix B discusses the use of G and M codes for part programming with illustrative examples. Appendix C explains the advanced concepts of aesthetics. The book is primarily intended as a text for courses in mechanical engineering, production engineering, and industrial design and management. It will also prove handy for practising engineers. Key Features • Provides concepts from material science, which include inputs on ceramics, rubber, polymers and other materials to make the design idea physically realizable. • Uses the modern Concurrent Design concept to satisfy diverse groups/areas such as marketing, vendors, production and quality assurance. • Considers the use of computers while analyzing modern techniques of prototyping, simulation of product and its use. Introduces AI, robots, AGV, PLC and AS/RS in manufacturing automation.

With the increasing complexity and dynamism in today's product design and manufacturing, more optimal, robust and practical approaches and systems are needed to support product design and manufacturing activities. Multi-objective Evolutionary Optimisation for Product Design and Manufacturing presents a focused collection of quality chapters on state-of-the-art research efforts in multi-objective evolutionary optimisation, as well as their practical applications to integrated product design and manufacturing. Multi-objective Evolutionary Optimisation for Product Design and Manufacturing consists of two major sections. The first presents a broad-based review of the key areas of research in multi-objective evolutionary optimisation. The second gives in-depth treatments of selected methodologies and systems in intelligent design and integrated manufacturing. Recent developments and innovations in multi-objective evolutionary optimisation make Multi-objective Evolutionary Optimisation for Product Design and Manufacturing a useful text for a broad readership, from academic researchers to practicing engineers.

Kamrani (University of Michigan) and Salhieh (University of Amman) propose a modular approach to the design of complex products using similar components that facilitates a quicker response to changing market demands. The approach focuses on decomposing the overall design problem into functionally independent elements, among which interactions are minimized. The second edition moves the case study of a four gear speed reducer into its own chapter. Annotation copyrighted by Book News, Inc., Portland, OR

This volume contains the edited technical presentations of PROLMAT 2006, the IFIP TC5 international conference held on June 15-17, 2006 at the Shanghai University in China. The papers collected here concentrate on knowledge strategies in Product Life Cycle and bring together researchers and industrialists with the objective of reaching a mutual understanding of the scientific - industry dichotomy, while facilitating the transfer of core research knowledge to core industrial competencies.

Basic yet comprehensive in approach, this book introduces readers interested in engineering, technology, and design to the methods and theory of concurrent or simultaneous design (i.e.,

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design for manufacturing), where all aspects of product design and manufacturing are involved, from the outset of the planning effort as a totality. It explores a broad range of methods for general product design and considers the significant issues that must be addressed early in the design process. This book examines historical antecedents, information, and data on product design theory and procedures. It considers computer applications in design and manufacturing and explores human factors (ergonomics) in design, and their applications to products and tools. The book discusses physical materials used in the design of quality products, and the methods employed to process these materials. It highlights special applications to graphics design and packaging and surveys the history of the functional, material and visual requirements of product design, and the methods used in industrial, engineering, and crafts design. Also explained are the legal aspects of product design relative to protecting the rights to intellectual property, and the issues of product liability.

Collaborative Product Design and Manufacturing Methodologies and Applications introduces a wide spectrum of collaborative engineering issues in design and manufacturing. It offers state-of-the-art chapters written by international experts from academia and industry, and reflects the most up-to-date R & D work and applications, especially those from the last three to five years. The book will serve as an essential reference for academics, upper-level undergraduate and graduate students and practicing professionals.

This book deals with Web applications in product design and manufacture, thus filling an information gap in digital manufacturing in the Internet era. It helps both developers and users to appreciate the potentials, as well as difficulties, in developing and adopting Web applications. The objective is to equip potential users and practitioners of Web applications with a better appreciation of the technology. In addition, Web application developers and new researchers in this field will gain a clearer understanding of the selection of system architecture and design, development and implementation techniques, and deployment strategies. The book is divided into two main parts. The first part gives an overview of Web and Internet and the second explains eight typical Web applications.

PRODUCT DESIGN AND MANUFACTURING PHI Learning Pvt. Ltd.

This book comprises select papers presented at the Conference on Innovative Product Design and Intelligent Manufacturing System (IPDIMS 2020). The book discusses the latest methods and advanced tools from different areas of design and manufacturing technology. The main topics covered include design methodologies, industry 4.0, smart manufacturing, and advances in robotics among others. The contents of this book are useful for academics as well as professionals working in the areas of industrial design, mechatronics, robotics, and automation.

Product Development begins with an understanding of market needs, within a sound business model, a well-defined financial strategy, and well-thought-out strategic goals. This new book by industry-expert Marc Annacchino, will help the professional engineer, manager, marketer, and all others who must come together as a working team, to better understand their respective roles and responsibilities in that process. Today, speeding the right value proposition to the market can make all the difference between success and failure. With case examples, organizational analysis and project planning tools, this new book looks at that longer, organizational view of product development, and how that view can improve product development cycle times and better take advantage of new market opportunities. It will help the product development team better adapt to change and a dynamic market in today's global economy through product platform management, and do so rationally and reliably. And it will help product development professionals to look for hidden value in existing product lines as they plan for that change and growth ahead. · Provides product development professionals with the concepts and tools for a more integrated, successful product development cycle · Promotes a more coherent deployment of managers, engineers, marketers, and sales

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personnel to achieve results within market opportunity in terms of time, cost and performance. Shows how to better identify and target product value propositions in product line extensions and in securing new markets

The Fundamentals of Product Design teaches students the key principles and processes of product design.

There are books aplenty on materials selection criteria for engineering design. Most cover the physical and mechanical properties of specific materials, but few offer much in the way of total product design criteria. This innovative new text/reference will give the "Big picture view of how materials should be selected—not only for a desired function but also for their ultimate performance, durability, maintenance, replacement costs, and so on. Even such factors as how a material behaves when packaged, shipped, and stored will be taken into consideration. For without that knowledge, a design engineer is often in the dark as to how a particular material used in particular product or process is going to behave over time, how costly it will be, and, ultimately, how successful it will be at doing what is supposed to do. This book delivers that knowledge. * Brief but comprehensive review of major materials functional groups (mechanical, electrical, thermal, chemical) by major material categories (metals, polymers, ceramics, composites) * Invaluable guidance on selection criteria at early design stage, including such factors as functionality, durability, and availability * Insight into lifecycle factors that affect choice of materials beyond simple performance specs, including manufacturability, machinability, shelf life, packaging, and even shipping characteristics * Unique help on writing materials selection specifications

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. This book provides an accurate overview of the recent research or industrial application in interactive design. The different arguments, taken from the international conference Virtual Concept 2005, will provide the reader with some advanced solutions concerning new methods and tools by discussing modelling techniques, design solution space exploration and interactive process organization.

This title covers the strategies, principles and techniques of manufacturing design "Making it uses contemporary design as a vehicle to describe over 90 production techniques, both established and cutting-edge, so that the mysteries of the processes are revealed in an accessible way." "This is the first book to approach the subject from a designer's point of view. The author has grouped the processes according to the shapes and physical dimensions of the finished

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Industrial Design: Materials and Manufacturing Guide, Second Edition provides the detailed coverage of materials and manufacturing processes that industrial designers need without their depth and overly technical discussions commonly directed toward engineers. Author Jim Lesko gives you the practical knowledge you need to develop a real-world understanding of materials and processes and make informed choices for industrial design projects. In this book, you will find everything from basic terminology to valuable insights on why certain shapes work best for particular applications. You'll learn how to extract the best performance from all of the most commonly used methods and materials.

Design for Manufacturability: How to Use Concurrent Engineering to Rapidly Develop Low-Cost, High-Quality Products for Lean Production shows how to use concurrent engineering teams to design products for all aspects of manufacturing with the lowest cost, the highest quality, and the quickest time to stable production. Extending the concepts of design for manufacturability to an advanced product development model, the book explains how to simultaneously make major improvements in all these product development goals, while enabling effective implementation of Lean Production and quality programs. Illustrating how to make the most of lessons learned from previous projects, the book proposes numerous improvements to current product development practices, education, and management. It outlines effective procedures to standardize parts and materials, save time and money with off-the-shelf parts, and implement a standardization program. It also spells out how to work with the purchasing department early on to select parts and materials that maximize quality and availability while minimizing part lead-times and ensuring desired functionality. Describes how to design families of products for Lean Production, build-to-order, and mass customization Emphasizes the importance of quantifying all product and overhead costs and then provides easy ways to quantify total cost Details dozens of design guidelines for product design, including assembly, fastening, test, repair, and maintenance Presents numerous design guidelines for designing parts for manufacturability Shows how to design in quality and reliability with many quality guidelines and sections on mistake-proofing (poka-yoke) Describing how to design parts for optimal manufacturability and compatibility with factory processes, the book provides a big picture perspective that emphasizes designing for the lowest total cost and time to stable production. After reading this book you will understand how to reduce total costs, ramp up quickly to volume production without delays or extra cost, and be able to scale up production rapidly so as not to limit growth.

- For beginners who are new to developing products and selling them- For experienced product developers looking to remove risks and fill in knowledge gaps- For inventors with new products seeking information on validation, manufacturing and sales channels- For Amazon Sellers looking to take the next step, to introduce unique products, grow into retailers, and expand their business. Complete step-by-step instructions on how to identify unique winning products, validate customer demand, ensure profitability, design and engineer your product, identify factories, negotiate effectively, manage shipping & logistics, and generate sales across all channels from independent retailers to chains and big box stores.

This book sets out an approach to the design and development of composite products that will lead to the maximum likelihood of developing commercially successful

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products, generally in the face of a great deal of uncertainty in most areas of the development process. The book is practically orientated, covering those areas of composite technology most critical to product developments, rather than those of the most theoretical importance, therefore providing a basis for mutual understanding among the broad field of composite specialists. The author's experience provides a hands-on approach to the methodology of design with composites. All those interested in composites design and manufacture, including those practising in such diverse fields as resin formulation, reinforcement, manufacture, design processing and manufacturing engineering will find this book invaluable.

"Outlines best practices and demonstrates how to design in quality for successful development of hardware and software products. Offers systematic applications tailored to particular market environments. Discusses Internet issues, electronic commerce, and supply chain."

Hailed as a groundbreaking and important textbook upon its initial publication, the latest iteration of *Product Design for Manufacture and Assembly* does not rest on those laurels. In addition to the expected updating of data in all chapters, this third edition has been revised to provide a top-notch textbook for university-level courses in product design and manufacturing design. The authors have added a comprehensive set of problems and student assignments to each chapter, making the new edition substantially more useful. See what's in the Third Edition: Updated case studies on the application of DFMA techniques Extended versions of the classification schemes of the features of products that influence the difficulty of handling and insertion for manual, high-speed automatic, and robot assembly Discussions of changes in the industry such as increased emphasis on the use of surface mount devices New data on basic manufacturing processes Coverage of powder injection molding Recognized as international experts on the re-engineering of electro-mechanical products, the methods and guidelines developed by Boothroyd, Dewhurst, and Knight have been documented to provide significant savings in the product development process. Often attributed with creating a revolution in product design, the authors have been working in product design manufacture and assembly for more than 25 years. Based on theory yet highly practical, their text defines the factors that influence the ease of assembly and manufacture of products for a wide range of the basic processes used in industry. It demonstrates how to develop competitive products that are simpler in configuration and easier to manufacture with reduced overall costs.

Treating such contemporary design and development issues as identifying customer needs, design for manufacturing, prototyping, and industrial design, *Product Design and Development* by Ulrich and Eppinger presents in a clear and detailed way a set of product development techniques aimed at bringing together the marketing, design, and manufacturing functions of the enterprise. The integrative methods in the book facilitate problem solving and decision making among people with different disciplinary perspectives, reflecting the current industry toward designing and developing products in cross-functional teams.

The importance of integrating design and manufacturing becomes apparent when the increase in the degree of difficulty of change is observed as the product development proceeds from concept to production in a serial engineering process. The greatest opportunity in design for manufacture occurs at the initial design stage before any

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commitments to tooling and equipment have been made. This research develops a framework and an implementation system dealing with integration of design, manufacturing and economic aspects in the development of a product. The objective is to evaluate process technology for a specified product design and to identify the best work/tool material combination and production conditions to optimize the production process. A commercial CAD/CAM package (SmartCAM) playing roles as a part design tool, a processing time simulator, and a NC code generator is integrated with a manufacturing database, and a machining cost model. This integrated system runs in Microsoft Windows environment under an external program which not only coordinates the activities of various modules but also enhances the capabilities of SmartCAM. This system allows product design evaluation for economic and technical criteria and recommends best manufacturing environment. An NC program containing recommended machining parameters is generated. Furthermore, the system reports on tool wear on each tool per part manufactured. This information is useful for cost analysis as well as for producing a tool replacement schedule.

This text explains the process of the design of product electronic enclosures. These products typically contain a printed circuit board. The text takes the reader from the original idea for a product, through the shipment in quantity to a customer. For the product enclosure designer, this proceeds through design layout, material selection, prototype building, testing, and ongoing design improvement. The book presents a substantive and lucid treatment of the structural, thermal, user-interface, assembly, quality control, and cost considerations of the product enclosure. Of special note is a discussion on the regulatory issues involved with the design of a product. A main thrust of the text is on the "commercialization" aspects of electronic products, that is, when an enclosure is needed for the product to meet environmental and certification requirements globally. The book targets the broadest audience tasked to design/manufacture an enclosure, from mechanical/industrial engineers to designers and technicians. While the intent of the text is not to provide a complete understanding of relevant physical phenomena addressed (strength of materials, shock and vibration, heat transfer), the book provides a ready reference on how and where these key properties may be considered in the design of most electronic enclosures. Elucidates successful enclosure design for electronic products, defining the design team and the definition of success Explains the processes for building enclosures, including printed circuit board layout (mechanical considerations) and optimal object placement, structural considerations, material selection, and user interface design Includes treatment of serviceability, product environments, standards and testing, cooling techniques as well as guidelines for Electromagnetic Compliance (EMC) standards and testing required to pass FCC/CE Reinforces design concepts presented with relevant solved problems

This book provides an in-depth study of the creative and manufacturing processes behind 50 contemporary domestic design objects. Chosen from all around the world, they span furniture, lighting, tableware, textiles, and other products. Featuring the work of both long-established and emerging designers, each product is selected for its significant use of new technology, unorthodox or complex production process, use of innovative materials (or traditional materials adapted in new and unexpected ways) and, in some cases, for the creative concept behind it. Beginning with a general

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introduction, each project is then presented through explanatory text as well as an inspirational image, sketch, detail shots of production processes, and the completed product. A glossary of production methods is also included. Process offers an interesting and useful insight into how products are designed, for students and professional designers alike.

A detailed reference to production techniques and materials counsels today's product designers on the range of processes, from traditional crafts to the latest technologies, in a guide that profiles more than seventy manufacturing processes.

Originally published under the title: Process, materials, and measurements, in 2006.

Analyzes all phases of the electronic product design process, including management, planning, quality control, design, manufacturing, and automation. A reference/textbook for students and professionals in such fields as electronics, manufacturing, circuit design, computer science. Annotation copyrig

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