# Assembly Line Design Methodology And Applications

*A comprehensive and dedicated guide to automotive production lines, The Automotive Body Manufacturing Systems and Processes addresses automotive body processes from the stamping operations through the final assembly activities. To begin, it discusses current metal forming practices, including stamping engineering, die development, and dimensional validation, and new innovations in metal forming, such as folding based forming, super-plastic, and hydro forming technologies. The first section also explains details of automotive spot welding (welding lobes), arc welding, and adhesive bonding, in addition to flexible fixturing systems and welding robotic cells. Guiding readers through each stage in the process of automotive painting, including the calculations needed to compute the number of applicators and paint consumption based on vehicle dimensions and demand, along with the final assembly and automotive mechanical fastening strategies, the book's systematic coverage is unique. The second module of the book focuses on the layout strategies of the automotive production line. A discussion of automotive aggregate planning and master production scheduling ensures that the reader is familiar with operational aspects. The book also reviews the energy emissions and expenditures of automotive production processes and proposes new technical solutions to reduce environmental impact. Provides extensive technical coverage of automotive production processes, discussing flexible stamping, welding and painting lines Gives complete information on automotive production costing as well as the supplier selection process Covers systems from the operational perspective, describing the aggregate and master production planning Details technical aspects of flexible automotive manufacturing lines Methodically discusses the layout and location strategies of automotive manufacturing systems to encompass the structural elements Features topic-related questions with answers on a companion website*

*This book gathers selected papers from Artificial Intelligence and Industrial Applications (A2IA'2020), the first installment of an annual international conference organized by ENSAM-Meknes at Moulay Ismail University, Morocco. The 29 papers presented here were carefully reviewed and selected from 141 submissions by an international scientific committee. They address various aspects of artificial intelligence such as digital twin, multiagent systems, deep learning, image processing and analysis, control, prediction, modeling, optimization and design, as well as AI applications in industry, health, energy, agriculture, and education. The book is intended for AI experts, offering them a valuable overview and global outlook for the future, and highlights a wealth of innovative ideas and recent, important advances in AI applications, both of a foundational and practical nature. It will also appeal to non-experts who are curious about this timely and important subject.*

*Assembly Line DesignMethodology and ApplicationsCRC Press*

*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*

*Annals of Scientific Society for Assembly, Handling and Industrial Robotics*

*Industrial Assembly*

*The Application of Lean within the Healthcare Industry*
*From the Stone Age to Lean Manufacturing and Beyond*
*Enabling Manufacturing Competitiveness and Economic Sustainability*
*Rivethead*

***From concept development to final production, this comprehensive text thoroughly examines the design, prototyping, and fabrication of engineering products and emphasizes modern developments in system modeling, analysis, and automatic control. This reference details various management strategies, design methodologies, traditional production techniqu***

***This book brings several original contributions to research and practical applications in the field of mass customization from the designer, manufacturer, and customer perspectives respectively. It presents advancements in product design for mass customization, design of assembly and supply chain processes, variety induced complexity models, complexity management, marketing tools, information systems to support decision-making, and critical success factors of this manufacturing and marketing strategy.. A special focus of interest is also on the use of product configurators in practice and sustainability assessment for mass customization strategy. The aim is to disseminate current developments and approaches for further theoretical investigation and practical applications of mass customized manufacturing systems.***

***Manufacturing industries are devoted to producing high-quality products in the most economical and timely manner. Quality, economics, and time not only indicate the customer-satisfaction level, but also measure the manufacturing per formance of a company. Today's manufacturing environments are becoming more and more complex, flexible, and information-intensive. Companies invest into the information technologies such as computers, communication networks, sensors, actuators, and other equipment that give them an abundance of information about their materials and resources. In the face of global competition, a manufacturing company's survival is becoming more dependent on how best this influx of in formation is utilized. Consequently, there evolves a great need for sophisticated tools of performance analysis that use this information to help decision makers in choosing the right course of action. These tools will have the capability of data analysis, modeling, computer simulation, and optimization for use in designing products and processes. International competition also has had its impact on manufacturing education and the government's support of it in the US. We see more courses offered in this area in industrial engineering and manufacturing systems engineering departments, operations research programs, and business schools. In fact, we see an increasing number of manufacturing systems engineering departments and manufacturing research centers in universities not only in the US but also in Europe, Japan, and many developing countries.***

***Today's fast-paced manufacturing culture demands a handbook that provides how-to, no-holds-barred, no-***

*frills information. Completely revised and updated, the Handbook of Manufacturing Engineering is now presented in four volumes. Keeping the same general format as the first edition, this second edition not only provides more information but makes it more accessible. Each individual volume narrows the focus while broadening the coverage, giving you immediate access to the information you need. Volume Four, Assembly Processes: Finishing, Packaging, and Automation deals exclusively with the finishing of a product. The proper selection of assembly process is critical, as it influences the production rate, quality, and cost of the product through tradeoffs in productivity of the facility and workers. Covering manual assembly as well as automation, the book explores the varied options available for assembly processes and emphasizes the importance of proper selection. Recognizing the growing importance and capabilities of automation, chapters cover the full spectrum of automation, including various types of automated machines, basic automation concepts, and flexible automation. The book's coverage also touches on packaging and provides an illustrative chapter devoted to printed board assemblies.*

*Encyclopedia of Production and Manufacturing Management*

*Manufacturing*

*Assembly Processes*

*Lean Assembly*

*The Automotive Body Manufacturing Systems and Processes*

*Designing, Constructing, and Managing a Lean Assembly Line*

*Theoretical Concepts and Practical Approaches*

*This open access book presents the proceedings of the 3rd Indo-German Conference on Sustainability in Engineering held at Birla Institute of Technology and Science, Pilani, India, on September 16–17, 2019. Intended to foster the synergies between research and education, the conference is one of the joint activities of the BITS Pilani and TU Braunschweig conducted under the auspices of Indo-German Center for Sustainable Manufacturing, established in 2009. The book is divided into three sections: engineering, education and entrepreneurship, covering a range of topics, such as renewable energy forecasting, design & simulation, Industry 4.0, and soft & intelligent sensors for energy efficiency. It also includes case studies on lean and green manufacturing, and life cycle analysis of ceramic products, as well as papers on teaching/learning methods based on the use of learning factories to improve students'problem-solving and personal skills. Moreover, the book discusses high-tech ideas to help the large number of unemployed engineering graduates looking for jobs become tech entrepreneurs. Given its broad scope, it will appeal to academics and industry professionals alike.*

*According to a report by the Institute of Medicine, up to 98,000 deaths per year occur in U.S. hospitals as a result of adverse events. In other words, errors in hospitals cause more annual deaths than car accidents, breast cancer, or AIDS. With the healthcare system in such critical condition, Lean is the best possible treatment.Winner of a 2013 S*

*It is easy to learn the philosophy and the concepts of kaizen. It is quite another challenge to translate the philosophy into action. While most books expound on the underlying principles and theory, Kaizen Assembly: Designing, Constructing, and Managing a Lean Assembly Line takes you step-by-step through an actual kaizen event. This approach demonstrates in detail the mindset, the processes, and the practical insight needed to transform your*

***current assembly line into a world-class lean operation. Chris Ortiz brings the experience of over 150 successful kaizen events to the pages of this unique guide. Using clear, succinct, and unambiguous language rather than more general and esoteric terms found in other books, he explains how to implement waste reduction, 5S, time and motion studies, line balancing, quality-at-the-source, visual management, and workstation and assembly line design. Taking a unique approach, the book follows an example of the assembly process for an electric bike including illustrations of nearly every step along the way. Ortiz even includes the most valuable teaching tool of all: past mistakes, how they were overcome, and how to identify and avoid them. Providing expert guidance that will last long after the consultants have left, Kaizen Assembly supplies the tools you need to make kaizen and lean assembly a permanent fixture at the heart of the shop floor.***

***Assembly lines are productive systems, which are very efficient for homogeneous products. In the automotive industry, an assembly line is used in the production of several vehicle variants, including numerous configurations, options, and add-ins. As a result, assembly lines must be at the same time specialized to provide high efficiency, but also flexible to allow the mass customization of the vehicles. In this book, the planning of assembly lines for uncertain demand is tackled and optimization algorithms are offered for the balancing of such lines. Building an assembly line is a commitment of several months or even years, it is understandable that the demand will fluctuate during the lifetime of an assembly line. New products are developed, others are removed from the market, and the decision of the final customer plays a role on the immediate demand. Therefore, the variation and uncertainty of the demand must be accounted for in an assembly line. In this book, methods dealing with random demand or random production sequence are presented, so that the practitioners can plan more robust and efficient production systems.***

***The Balancing of Mixed-Model Hybrid Assembly Lines with Genetic Algorithms***

***Manufacturing Facilities Design and Material Handling***

***Artificial Intelligence Techniques for Cyber-Physical, Digital Twin Systems and Engineering Applications***

***Useful Methods and Techniques***

***Proceedings of the 4th International Conference on Changeable, Agile, Reconfigurable and Virtual production (CARV2011), Montreal, Canada, 2-5 October 2011***

***3rd Indo-German Conference on Sustainability in Engineering***

***9th IFIP WG 5.5 International Precision Assembly Seminar, IPAS 2020, Virtual Event, December 14–15, 2020, Revised Selected Papers***

?Assembly Line Planning and Control describes the basic fundamentals of assembly lines for single model lines, mixed model make-to-stock lines, mixed model make-to-order lines and for one-station assembly. The book shows how to select the quantity of units to schedule for a shift duration, compute the number of operators needed on a line, set the conveyor speed, coordinate the main line with sub-assembly lines, assign the work elements to the operators on the line, sequence the models down the line, sequence the jobs down the line, calculate the part and component requirements for a line and for each station, determine the replenish needs of the parts and components from the suppliers, compute the similarity between the models being produced and show applications, use learning curves to estimate time and costs of assembly, and measure the efficiency of the line. The material is timeless and the book will never become obsolete. The author presents solutions with easy-to-understand numerical examples that can be applied to real-life applications.?

The industrial revolution, mechanization, water and steam power, computers, and automation have given an enormous

boost to manufacturing productivity. "Faster, Better, Cheaper" in the History of Manufacturing shows how the ability to make products faster, better, and cheaper has evolved from the stone age to modern times. It explains how different developments over time have raised efficiency and allowed the production of more and better products with less effort and materials, and hence faster, better, and cheaper. In addition, it describes the stories of inventors, entrepreneurs, and industrialists and looks at the intersection between technology, society, machines, materials, management, and – most of all – humans. "Faster, Better, Cheaper" in the History of Manufacturing follows this development throughout the ages. This book covers not only the technical aspects (mechanization, power sources, new materials, interchangeable parts, electricity, automation), but organizational innovations (division of labor, Fordism, Talyorism, Lean). Most of all, it is a story of the people that invented, manufactured, and marketed the products. The book shows how different developments over time raised efficiency and allowed production of more with less effort and materials, which brought us a large part of the wealth and prosperity we enjoy today. The stories of real inventors and industrialists are told, which includes not only their successes but also their problems and failures. The effect of good or bad management on manufacturing is a recurring theme in many chapters, as is the fight for intellectual property through thrilling tales of espionage. This is a story of successes and failures. It is not only about technology but also about social aspects. Ultimately, it is not a book about machines but about people!

This open access book constitutes the refereed post-conference proceedings of the 9th IFIP WG 5.5 International Precision Assembly Seminar, IPAS 2020, held virtually in December 2020. The 16 revised full papers and 10 revised short papers presented together with 1 keynote paper were carefully reviewed and selected from numerous submissions. The papers address topics such as assembly design and planning; assembly operations; assembly cells and systems; human centred assembly; and assistance methods in assembly.

Supply Chain Engineering considers how modern production and operations management techniques can respond to the pressures of the competitive global marketplace. It presents a comprehensive analysis of concepts and models related to outsourcing, dynamic pricing, inventory management, RFID, and flexible and re-configurable manufacturing systems, as well as real-time assignment and scheduling processes. A significant part is also devoted to lean manufacturing, line balancing, facility layout and warehousing techniques. Explanations are based on examples and detailed algorithms while discarding complex and unnecessary theoretical minutiae. All examples have been carefully selected from an industrial application angle. This book is written for students and professors in industrial and systems engineering, management science, operations management and business. It is also an informative reference for managers looking to improve the efficiency and effectiveness of their production systems.

Manufacturing Systems: Theory and Practice

Assembly Line Planning and Control

Design, Production, Automation, and Integration
Cell Design for Transforming the Production Process
Enhancing Future Skills and Entrepreneurship
Occupational Outlook Handbook
Taking Improvement from the Assembly Line to Healthcare

*Overviews manufacturing systems from the ground up, following the same concept as in the first edition. Delves into the fundamental building blocks of manufacturing systems: manufacturing processes and equipment. Discusses all topics from the viewpoint of four fundamental manufacturing attributes: cost, rate, flexibility and quality.*

*The changing manufacturing environment requires more responsive and adaptable manufacturing systems. The theme of the 4th International Conference on Changeable, Agile, Reconfigurable and Virtual production (CARV2011) is "Enabling Manufacturing Competitiveness and Economic Sustainability". Leading edge research and best implementation practices and experiences, which address these important issues and challenges, are presented. The proceedings include advances in manufacturing systems design, planning, evaluation, control and evolving paradigms such as mass customization, personalization, changeability, re-configurability and flexibility. New and important concepts such as the dynamic product families and platforms, co-evolution of products and systems, and methods for enhancing manufacturing systems' economic sustainability and prolonging their life to produce more than one product generation are treated. Enablers of change in manufacturing systems, production volume and capability scalability and managing the volatility of markets, competition among global enterprises and the increasing complexity of products, manufacturing systems and management strategies are discussed. Industry challenges and future directions for research and development needed to help both practitioners and academicians are presented.*

*Proceedings of the Flexible Automation and Integrated Manufacturing Conference held in Limerick, Ireland, in June 1993*

*This book attempts to treat line design and its related subjects in a cohesive manner, with an emphasis on design applications. It discusses general guidelines for setting up assumptions and determining line performance parameters, based on empirical data from literature reports.*

*A Step-by-step Guide*
*Methodology and Applications*

*A Comprehensive Guide for Managers, Second Edition*
*Balancing and Sequencing of Assembly Lines*
*An Integrated Methodology for Assembly Line Design Utilizing an Expert System*
*Tales from the Assembly Line*
*Knowledge Acquisition in Practice*

***This book covers the area of unpaced, unbalanced production lines. You will find an up-to-date discussion of how designing these lines can be made more efficient by taking advantage of inherent imbalance -- for example operators who work at different speeds- a concept which has traditionally been seen as an obstacle to efficient production. A series of experiments are presented to illustrate the issues involved in improving performance through production line imbalance. This area is of interest to postgraduate and executive level students interested in the area of production, and to managers of manual or semi-automated production lines who are interested in innovative approaches to line design. In this book you will find some surprisingly easy ways to improve performance with low or zero costs. Emphasis is placed on reducing the amount of time production lines lie idle, and on reducing work in process. This is a timely contribution to the field when managers are casting around for new ways to cut waste and reduce their use of natural resources.***

***Industrial Assembly is a rapidly changing field with significant importance in production. This book is the first of its kind to combine technology, design, methods, and planning and control models of assembly operations and systems. With the increasing importance of assembly in industry and of simultaneous engineering approaches, this timely publication provides: comprehensive coverage of technological, engineering, and management aspects of this field; multi-disciplinary approaches to rationalization of assembly operations and systems; explanation of qualitative models, information technologies, and design techniques, which have been practised effectively in industrial assembly; as well as theoretical foundations and emerging trends that shape the future of assembly.***

***This book addresses the preparation and application of design layout analyses with concurrent engineering teams in six steps that capture design intent and add value to design process. It offers tools for eliminating costly trial-and-error approaches and deliver economically viable***

***products. The authors discuss product design techniques that allevi***
***Efficient assembly line design is a problem of considerable industrial importance. Assembly Line Design will be bought by technical personnel working in design, planning and production departments in industry as well as managers in industry who want to learn more about concurrent engineering. This book will also be purchased by researchers and postgraduate students in mechanical, manufacturing or micro-engineering.***
***Finishing, Packaging, and Automation***
***The Nuts and Bolts of Making Assembly Operations Flow***
***One-Piece Flow***
***A Comprehensive Guide for Managers***
***Kaizen Assembly***
***Advanced Design and Manufacturing in Global Competition***
***Production Line Efficiency***

This book introduces several mathematical models in assembly line balancing based on stochastic programming and develops exact and heuristic methods to solve them. An assembly line system is a manufacturing process in which parts are added in sequence from workstation to workstation until the final assembly is produced. In an assembly line balancing problem, tasks belonging to different product models are allocated to workstations according to their processing times and precedence relationships among tasks. It incorporates two features, uncertain task times, and demand volatility, separately and simultaneously, into the conventional assembly line balancing model. A real-life case study related to the mask production during the COVID-19 pandemic is presented to illustrate the application of the proposed framework and methodology. The book is intended for graduate students who are interested in combinatorial optimizations in manufacturing with uncertain input.

The book deals with two main decision problems which arise when flow-line production systems are installed and operated. The assembly line balancing problem consists of partitioning the work, necessary to assemble the product(s), among different stations of an assembly line. If several models of a product are jointly processed on a line, this medium-term problem is connected with the short-term problem of determining an operating sequence of the models. In Part I balancing and sequencing problems are discussed, classified, and arranged within a hierarchical planning system. In the present second edition special emphasis is given to u-shaped assembly lines which are important components of modern just-in-time production systems. Part II is concerned with exact and heuristic procedures for solving those decision problems. For each problem type considered, a survey of existing procedures is given and new efficient solution methods are developed. Comprehensive numerical investigations showing the effectiveness of the new methods and their superiority over existing approaches are reported.

This advanced introduction to optimal production planning for PCB assembly details ways a reader can improve the efficiency of the assembly line in their company. It presents mathematical modeling techniques and heuristic solution approaches to optimize some critical PCB assembly problems arising in the industry.

In today's production world, many of the lines seem unpaced and unbalanced. Inside this book, you will learn new designs for these lines that can lead to more efficiency by taking advantage of inherent imbalance—for example, operators who work at different speeds—a concept that has traditionally been seen as an obstacle to efficient production. The authors have included a series of experiments that illustrate the issues involved in improving performance through production line imbalance, as well as some surprisingly easy ways to improve performance with low or zero costs. Emphasis is placed on reducing the amount of time production lines lie idle, and on reducing work in process. This is a timely contribution to the field when managers are casting around for new ways to cut waste and reduce their use of natural resources.

Faster, Better, Cheaper in the History of Manufacturing

Flexible Automation and Integrated Manufacturing 1993

Theory and Practice

Mass Customized Manufacturing

Optimal Production Planning for PCB Assembly

Supply Chain Engineering

Integrated Product Design and Manufacturing Using Geometric Dimensioning and Tolerancing

*This Open Access proceedings present a good overview of the current research landscape of industrial robots. The objective of MHI Colloquium is a successful networking at academic and management level. Thereby the colloquium is focussing on a high level academic exchange to distribute the obtained research results, determine synergetic effects and trends, connect the actors personally and in conclusion strengthen the research field as well as the MHI community. Additionally there is the possibility to become acquainted with the organizing institute. Primary audience are members of the scientific association for assembly, handling and industrial robots (WG MHI).*

*The man the Detroit Free Press calls "a blue collar Tom Wolfe" delivers a full-barreled blast of truth and gritty reality in Rivethead, a no-holds-barred journey through the belly of the American industrial beast.*

*This project-oriented facilities design and material handling reference explores the techniques and procedures for developing an efficient facility layout, and introduces some of the state-of-the-art tools involved, such as computer simulation. A "how-to," systematic, and methodical approach leads readers through the collection, analysis and development of information to produce a quality functional plant layout. Lean manufacturing; work cells and group technology; time standards; the concepts behind calculating machine and personnel requirements, balancing assembly lines, and leveling workloads in manufacturing cells; automatic identification and data collection; and ergonomics. For facilities planners, plant layout, and industrial engineer professionals who are involved in facilities planning and design.*

*The proceedings of the fourth ICMA in 2004 represent a huge contribution to research in this area. Everyone attending the conference was asked to submit their papers electronically which meant that 100 top quality papers from no less that 10 different countries contributed to the theme of the conference.*

*Integrated Design of a Product Family and Its Assembly System*

*Multiobjective Genetic Algorithm Approach*

*Assembly Line Balancing under Uncertain Task Time and Demand Volatility*
*Assembly-Line Balancing under Demand Uncertainty*
*Assembly Line*
*Product Design for Manufacture and Assembly*
*Smart Technologies for Precision Assembly*

Network models are critical tools in business, management, science and industry. “Network Models and Optimization” presents an insightful, comprehensive, and up-to-date treatment of multiple objective genetic algorithms to network optimization problems in many disciplines, such as engineering, computer science, operations research, transportation, telecommunication, and manufacturing. The book extensively covers algorithms and applications, including shortest path problems, minimum cost flow problems, maximum flow problems, minimum spanning tree problems, traveling salesman and postman problems, location-allocation problems, project scheduling problems, multistage-based scheduling problems, logistics network problems, communication network problem, and network models in assembly line balancing problems, and airline fleet assignment problems. The book can be used both as a student textbook and as a professional reference for practitioners who use network optimization methods to model and solve problems.

Production and manufacturing management since the 1980s has absorbed in rapid succession several new production management concepts: manufacturing strategy, focused factory, just-in-time manufacturing, concurrent engineering, total quality management, supply chain management, flexible manufacturing systems, lean production, mass customization, and more. With the increasing globalization of manufacturing, the field will continue to expand. This encyclopedia's audience includes anyone concerned with manufacturing techniques, methods, and manufacturing decisions.

By reconfiguring your traditional assembly lines into production cells based on one-piece flow, you can drastically reduce your lead time, staffing requirements, and number of defects. Kenichi Sekine studied under the late Shigeo Shingo and is responsible for many recent advances in the deployment of the Toyota Production System in Japan. In this comprehensive book, Sekine provides an in-depth education into the why's and how's of the restructuring process. Sekine first examines the basic principles of process flow building, then offers detailed case studies of how various industries designed unique one-piece flow systems (parallel, L-shaped, and U-shaped floor plans) to meet their particular needs. One-Piece Flow describes each step in the process of establishing one-piece flow and: (1) provides ample "test your skills" worksheets that guide you through the solution of problems, and (2) includes over 300 illustrations and 14 single-page case studies that show how to cut assembly personnel in various industries. With this book, plant managers will learn how to eliminate overstaffing waste and build a multi-skilled work force equipped to support JIT manufacturing. The book includes: Basic concept of one-piece production Case studies Process razing techniques U-shaped cells for

assembly lines Techniques for removing waste from factories Establishing one-piece flow at a factory that produces small lots on a customer-order basis "Single" delivery at MYNAC

This is the first book to provide a step-by-step guide to the methods and practical aspects of acquiring, modelling, storing and sharing knowledge. The reader is led through 47 steps from the inception of a project to its conclusion. Each is described in terms of reasons, required resources, activities, and solutions to common problems. In addition, each step has a checklist which tracks the key items that should be achieved.

Assembly Line Design

Performance Analysis of Manufacturing Systems

Network Models and Optimization

International Conference on Manufacturing Automation

Artificial Intelligence and Industrial Applications

An assembly line is a manufacturing process in which parts are added to a product in a sequential manner using optimally planned logistics to create a finished product in the fastest possible way. It is a flow-oriented production system where the productive units performing the operations, referred to as stations, are aligned in a serial manner. The present edited book is a collection of 12 chapters written by experts and well-known professionals of the field. The volume is organized in three parts according to the last research works in assembly line subject. The first part of the book is devoted to the assembly line balancing problem. It includes chapters dealing with different problems of ALBP. In the second part of the book some optimization problems in assembly line structure are considered. In many situations there are several contradictory goals that have to be satisfied simultaneously. The third part of the book deals with testing problems in assembly line. This section gives an overview on new trends, techniques and methodologies for testing the quality of a product at the end of the assembling line.

Integrated Design of a Product Family and Its Assembly System presents an integrated approach for the design of a product family and its assembly system, whose main principles consider the product family as a fictitious unique product for which the assembly system is to be devised. It imposes assembly and operation constraints as late as possible in the design process to get liberties in the system design, and adapts the product family at each design stage to integrate the new constraints related to the successive design choices. Integrated Design of a Product Family and Its Assembly System is an important, must-have book for researchers and Ph.D. students in Computer-Integrated Manufacturing, Mechanical Engineering, and Manufacturing, as well as practitioners in the Design, Planning and Production departments in the manufacturing industry. Integrated Design of a Product Family and Its Assembly System is also suitable for use as a textbook in courses such as Computer-Aided Design,

Concurrent Engineering, Design for Assembly, Process Planning, and Integrated Design.
With examples drawn from aerospace, electronics, household appliance, personal products, and automotive industries, Lean Assembly covers the engineering of assembly operations through: Characterizing the demand in terms of volume by product and product family, component consumption, seasonal variability and life cycle. Matching the physical structure of the shop floor to the demand with the goal of approaching takt-driven production as closely as possible. Working out the details of assembly tasks station by station, including station sizing, tooling, fixturing, operator instructions, part presentation, conveyance between stations, and the geometry of assembly lines as a whole. Incorporating mistake-proofing, successive inspection, and test operations for quality assurance. Lean Assembly differs from most other books on lean manufacturing in that it focuses on technical content as a driver for implementation methods. The emphasis is on exactly what should be done. This book should be the "dog-eared" and "penciled-in" resource on every assembly engineer's desk.