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This book presents a comprehensive and up to date account of the chemotherapy of parasitic diseases, both human and veterinary. The book starts with an overview of parasitic diseases. The body of the book is divided into two parts: antihelminthic drugs, and antiprotozoal drugs. Both parts start with chapters highlighting the 'biochemical targets' available for chemotherapeutic interference. Individual chapters deal with one chemical class of compounds and describe their origin, structure-activity relationship, mode of action, and methods of synthesis and their status both in clinical and veterinary practice. The book will be useful to a wide spectrum of readers: students embarking on a research career in parasitic chemotherapy, clinicians (and veterinarians) and clinical pharmacologists desiring detailed information about the drugs currently in use, and pharmaceutical technologists wanting to update their knowledge of the methods of manufacture. This book brings together some of the most influential pieces of research undertaken around the world in design synthesis. It is the first comprehensive work of this kind and covers all three aspects of research in design synthesis: - understanding what constitutes and influences synthesis; - the major approaches to synthesis; - the diverse range of tools that are created to support this crucial design task. With its range of tools and methods covered, it is an ideal introduction to design synthesis for those intending to research in this area as well as being a valuable source of ideas for educators and practitioners of engineering design. Over the past decade there has been a dramatic change in the role played by design automation for electronic systems. Ten years ago, integrated circuit (IC) designers were content to use the computer for circuit, logic, and limited amounts of high-level simulation, as well as for capturing the digitized mask layouts used for IC manufacture. The tools were only aids to design-the designer could always find a way to implement the chip or board manually if the tools failed or if they did not give acceptable results. Today, however, design technology plays an indispensable role in the design of electronic systems and is critical to achieving time-to-market, cost, and performance targets. In less than ten years, designers have come to rely on automatic or semi automatic CAD systems for the physical design of complex ICs containing over a million transistors. In the past three years, practical logic synthesis systems that take into account both cost and performance have become a commercial reality and many designers have already relinquished control of the logic netlist level of design to automatic computer aids. To date, only in certain well-defined areas, especially digital signal processing and telecommunications, have higher-level design methods and tools found significant success. However, the forces of time-to-market and growing system complexity will demand the broad-based adoption of high-level, automated methods and tools over the next few years. This book serves as a hands-on guide to timing constraints in integrated circuit design. Readers will learn to maximize performance of their IC designs, by specifying timing requirements correctly. Coverage includes key aspects of the design flow impacted by timing constraints, including synthesis, static timing analysis and placement and routing. Concepts needed for specifying timing requirements are explained in detail and then applied to specific stages in the design flow, all within the context of Synopsys Design Constraints (SDC), the industry-leading format for specifying constraints. Embedded System Design: Modeling, Synthesis and Verification introduces a model-based approach to system level design. It presents modeling techniques for both computation and communication at different levels of abstraction, such as specification, transaction level and cycle-accurate level. It discusses synthesis methods for system level architectures, embedded software and hardware components. Using these methods, designers can develop applications with high level models, which are automatically translatable to low level implementations. This book, furthermore, describes simulation-based and formal verification methods that are essential for achieving design confidence. The book concludes with an overview of existing tools along with a design case study outlining the practice of embedded system design. Specifically, this book addresses the following topics in detail: . System modeling at different abstraction levels . Model-based system design . Hardware/Software codesign . Software and Hardware component synthesis . System verification This book is for groups within the embedded system community: students in courses on embedded systems, embedded application developers, system designers and managers, CAD tool developers, design automation, and system engineering. Design synthesis is a way of thinking about complicated, multifaceted problems of a large scale with a repeatable degree of success. Design synthesis methods can be applied in business, with the goal of producing new and compelling products and services, and they can be applied in government, with the goal of changing culture and bettering society. In both contexts, however, there is a need for speed and for aggressive action. This text is immediately relevant, and is more relevant than ever, as we acknowledge and continually reference a feeling of an impending and massive change. Simply, this text is intended to act as a practitioner's guide to exposing the magic of design. A comprehensive overview of different porous polymer systems focusing on structure design, synthesis method and properties. "These notes are about the process of design: the process of inventing things which display new physical order, organization, form, in response to function." This book, opening with these words, presents an entirely new theory of the process of design. In the first part of the book, Christopher Alexander discusses the process by which a form is adapted to the context of human needs and demands that has called it into being. He shows that such an adaptive process will be successful only if it proceeds piecemeal instead of all at once. It is for this reason that forms from traditional un-self-conscious cultures, molded not by designers but by the slow pattern of changes within tradition, are so beautifully organized and adapted. When the designer, in our own self-conscious culture, is called on to create a form that is adapted to its context he is unsuccessful, because the preconceived categories out of which he builds his picture of the problem do not correspond to the inherent components of the problem, and therefore lead only to the arbitrariness, willfulness, and lack of understanding which plague the design of modern buildings and modern cities. In the second part, Mr. Alexander presents a method by which the designer may bring his full creative imagination into play, and yet avoid the traps of irrelevant preconception. He shows that, whenever a problem is stated, it is possible to ignore existing concepts and to create new concepts, out of the structure of the problem itself, which do correspond correctly to what he calls the subsystems of the adaptive process. By treating each of these subsystems as a separate subproblem, the designer can translate the new concepts into form. The form, because of the process, will be well-adapted to its context, non-arbitrary, and correct. The mathematics underlying this method, based mainly on set theory, is fully developed in a long appendix. Another appendix demonstrates the application of the method to the design of an Indian village. CD-ROM contains: Working Model 2D Homework Edition 4.1 -- Working Model simulations -- Author-written programs (including FOURBAR and DYNACAM) -- Scripted Matlab analysis and simulations files -- FE Exam Review for Kinematics and Applied Dynamics. The Leading Integrated Chemical Process Design Guide: With Extensive Coverage of Equipment Design and Other Key Topics More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Fifth Edition, presents design as a creative process that integrates the big-picture and small details, and knows which to stress when and why. Realistic from start to finish, it moves readers beyond classroom exercises into open-ended, real-world problem solving. The authors introduce up-to-date, integrated techniques ranging from finance to operations, and new plant design to existing process optimization. The fifth edition includes updated safety and ethics resources and economic factors indices, as well as an extensive, new section focused on process equipment design and performance, covering equipment design for common unit operations, such as fluid flow, heat transfer, separations, reactors, and more. Conceptualization and analysis: process diagrams, configurations, batch processing, product design, and analyzing existing processes Economic analysis: estimating fixed capital investment and manufacturing costs, measuring process profitability, and more Synthesis and optimization: process simulation, thermodynamic models, separation operations, heat integration, steady-state and dynamic process simulators, and process regulation Chemical equipment design and performance: a full section of expanded and revamped coverage of designing process equipment and evaluating the performance of current equipment Advanced steady-state simulation: goals, models, solution strategies, and sensitivity and optimization results Dynamic simulation: goals, development, solution methods, algorithms, and solvers Societal impacts: ethics, professionalism, health, safety, environmental issues, and green engineering Interpersonal and communication skills: working in teams, communicating effectively, and writing better reports This text draws on a combined 55 years of innovative instruction at West Virginia University (WVU) and the University of Nevada, Reno. It includes suggested curricula for one- and two-semester design courses, case studies, projects, equipment cost data, and extensive preliminary design information for jump-starting more detailed analyses. Chemical Solution Synthesis for Materials Design and Thin Film Device Applications presents current research on wet chemical techniques for thin-film based devices. Sections cover the quality of thin films, types of common films used in devices, various thermodynamic properties, thin film patterning, device configuration and applications. As a whole, these topics create a roadmap for developing new materials and incorporating the results in device fabrication. This book is suitable for graduate, undergraduate, doctoral students, and researchers looking for quick guidance on material synthesis and device fabrication through wet chemical routes. Provides the different wet chemical routes for materials synthesis, along with the most relevant thin film structured materials for device applications Discusses patterning and solution processing of inorganic thin films, along with solvent-based processing techniques Includes an overview of key processes and methods in thin film synthesis, processing and device fabrication, such as nucleation, lithography and solution processing . Network Analysis. . Network Functions and Their Realizability. . Introductory Filter Concepts. . The Approximation Problem. . Sensitivity. . Passive Network Synthesis. . Basics of Active Filter Synthesis. . Positive Feedback Biquad Circuits. . Negative Feedback Biquad Circuits. . The Three Amplifier Biquad. . Active Networks Based on Passive Ladder Structures. . Effects of Real Operational Amplifiers on Active Filters. . Design Optimization and Manufacture of Active Filters. "These notes are about the process of design: the process of inventing things which display new physical order, organization, form, in response to function." This book, opening with these words, presents an entirely new theory of the process of design. In the first part of the book, Christopher Alexander discusses the process by which a form is adapted to the context of human needs and demands that has called it into being. He shows that such an adaptive process will be successful only if it proceeds piecemeal instead of all at once. It is for this reason that forms from traditional un-self-conscious cultures, molded not by designers but by the slow pattern of changes within tradition, are so beautifully organized and adapted. When the designer, in our own self-conscious culture, is called on to create a form that is adapted to its context he is unsuccessful, because the preconceived categories out of which he builds his picture of the problem do not correspond to the inherent components of the problem, and therefore lead only to the arbitrariness, willfulness, and lack of understanding which plague the design of modern buildings and modern cities. In the second part, Mr. Alexander presents a method by which the designer may bring his full creative imagination into play, and yet avoid the traps of irrelevant preconception. He shows that, whenever a problem is stated, it is possible to ignore existing concepts and to create new concepts, out of the structure of the problem itself, which do correspond correctly to what he calls the subsystems of the adaptive process. By treating each of these subsystems as a separate subproblem, the designer can translate the new concepts into form. The form, because of the process, will be well-adapted to its context, non-arbitrary, and correct. The mathematics underlying this method, based mainly on set theory, is fully developed in a long appendix. Another appendix demonstrates the application of the method to the design of an Indian village. This book examines and evaluates the strategies utilized to design and synthesize pharmaceutically active agents. Significant updates over the last 10 years since the publication of the 1st edition include synthesis of enantiomerically pure isomers, novel chemical methodologies, and new pharmaceutical agents targeted at novel biological endpoints. Written by an experienced successful author, this book meets the needs of a growing community of researchers in pharmaceutical R & D, as well as medical professionals, by providing a useful guide for designing and synthesizing pharmaceutical agents. Additionally, it is a useful text for medicinal chemistry students. This long-awaited graduate level book, written by one of the world's leading organic chemists in collaboration with two of his former and present coworkers, adopts a refreshingly unique approach to synthesis planning and execution. Following an introductory look at the concept of synthesis, the authors discuss the Why, What, and How of organic synthesis as they apply to natural products. Although emphasis is on the Chiron Approach utilizing amino-acids, carbohydrates, hydroxy acids, terpenes, lactones and other naturally occurring small molecules as starting materials, catalytic asymmetric methods are also included as a corollary whenever relevant. A must-have source of first class information for everyone working in organic synthesis, be it in academia or industry. With a foreword by Larry E. Overman and David W. C. MacMillan Aircraft Conceptual Design Synthesis means design by fitness-for-purpose. Design engineers can jump off from the point of given parameters and requirements – required performance, payloads and other factors. This is the first book for the aeronautical designer devoted to guiding the reader through this highly effective conceptual design synthesis process. This forms the procedure for the initial stage of the aircraft design process – the interpretation of a requirement into the preliminary layout. A logical design sequence is developed utilizing original modules to represent propulsion, lift, drag, mass, and performance. Aircraft Conceptual Design Synthesis includes a disk of spreadsheets that provides core data. Unlike existing approaches, the design synthesis method can be applied to novel aircraft concepts. CONTENTS INCLUDE The design process Aircraft configuration Flight regime and powerplant considerations Fuselage layout Configuration of the wing Basic lift, drag and mass representations Performance estimation Parametric analysis and optimisation Analysis of concept design "This is an important landmark book and in my view will become a standard by which others will be compared" – Dr E C P Ransom, Kingston University, UK Electrostatic discharge (ESD) continues to impact semiconductor components and systems as technologies scale from micro- to nano-electronics. This book studies electrical overstress, ESD, and latchup from a whole-chip ESD design synthesis approach. It provides a clear insight into the integration of ESD protection networks from a generalist perspective, followed by examples in specific technologies, circuits, and chips. Uniquely both the semiconductor chip integration issues and floorplanning of ESD networks are covered from a 'top-down' design approach. Look inside for extensive coverage on: integration of cores, power bussing, and signal pins in DRAM, SRAM, CMOS image processing chips, microprocessors, analog products, RF components and how the integration influences ESD design and integration architecturing of mixed voltage, mixed signal, to RF design for ESD analysis floorplanning for peripheral and core I/O designs, and the implications on ESD and latchup guard ring integration for both a 'bottom-up' and 'top-down' methodology addressing I/O guard rings, ESD guard rings, I/O to I/O, and I/O to core classification of ESD power clamps and ESD signal pin circuitry, and how to make the correct choice for a given semiconductor chip examples of ESD design for the state-of-the-art technologies discussed, including CMOS, BiCMOS, silicon on insulator (SOI), bipolar technology, high voltage CMOS (HVCOS), RF CMOS, and smart power practical methods for the understanding of ESD circuit power distribution, ground rule development, internal bus distribution, current bus analysis, quality metrics ESD: Design and Synthesis is a continuation of the author's series of books on ESD protection. It is an essential reference for: ESD, circuit, and semiconductor engineers; design synthesis team leaders; layout design, characterisation, floorplanning, test and reliability engineers; technicians; and groundrule and test site developers in the manufacturing and design of semiconductor chips. It is also useful for graduate and undergraduate students in electrical engineering, semiconductor sciences, and manufacturing sciences, and on courses involving the design of ESD devices, chips and systems. This book offers a useful insight into the issues that confront modern technology as we enter the nano-electronic era. Search User Interfaces (SUIs) represent the gateway between people who have a task to complete, and the repositories of information and data stored around the world. Not surprisingly, therefore, there are many communities who have a vested interest in the way SUIs are designed. There are people who study how humans search for information, and people who study how humans use computers. There are people who study good user interface design, and people who design aesthetically pleasing user interfaces. There are also people who curate and manage valuable information resources, and people who design effective algorithms to retrieve results from them. While it would be easy for one community to reject another for their limited ability to design a good SUI, the truth is that they all can, and they all have made valuable contributions. Fundamentally, therefore, we must accept that designing a great SUI means leveraging the knowledge and skills from all of these communities. The aim of this book is to at least acknowledge, if not integrate, all of these perspectives to bring the reader into a multidisciplinary mindset for how we should think about SUI design. Further, this book aims to provide the reader with a framework for thinking about how different innovations each contribute to the overall design of a SUI. With this framework and a multidisciplinary perspective in hand, the book then continues by reviewing: early, successful, established, and experimental concepts for SUI design. The book then concludes by discussing how we can analyse and evaluate the on-going developments in SUI design, as this multidisciplinary area of research moves forwards. Finally, in reviewing these many SUIs and SUI features, the book finishes by extracting a series of 20 SUI design recommendations that are listed in the conclusions. Table of Contents: Introduction / Searcher-Computer Interaction / Early Search User Interfaces / Modern Search User Interfaces / Experimental Search User Interfaces / Evaluating Search User Interfaces / Conclusions Armed with this book, chemical engineers will have a collection of modern strategies for the design of chemical products and processes. It emphasizes a systematic approach and integrates product design more thoroughly throughout the chapters. New case studies on process design are included to make the concepts more relevant. The social aspects and economics of product design are introduced, and the Stage-Gate Product Development Process is explored in parallel tracks for several chemical products. The accompanying registration card grants access to a companion website that also provides chemical engineers with numerous examples of the simulator input and output, with frame-by-frame instructions to discuss the nature of the models provided for the processing units. In the early 1960s systematic techniques were introduced to guide engineers in producing high-quality designs. By the mid-1980s, these methods evolved from their informal guideline-like origins to more formal computable methods. Recently, highly automated design synthesis techniques have emerged. This timely work reviews the state of the art in formal design synthesis methods. It also provides an in-depth exploration of several representative projects in formal design synthesis and examines future directions in computational design synthesis research. The chapters are written by internationally renowned experts in engineering and architectural design. Since the education of aeronautical engineers at Delft University of Technology started in 1940 under the inspiring leadership of Professor H.J. van der Maas, much emphasis has been placed on the design of aircraft as part of the student's curriculum. Not only is aircraft design an optional subject for thesis work, but every aeronautical student has to carry out a preliminary airplane design in the course of his study. The main purpose of this preliminary design work is to enable the student to synthesize the knowledge obtained separately in courses on aerodynamics, aircraft performances, stability and control, aircraft structures, etc. The student's exercises in preliminary design have been directed through the years by a number of staff members of the Department of Aerospace Engineering in Delft. The author of this book, Mr. E. Torenbeek, has made a large contribution to this part of the study programme for many years. Not only has he acquired vast experience in teaching airplane design at university level, but he has also been deeply involved in design-oriented research, e.g. developing rational design methods and systematizing design information. I am very pleased that this wealth of experience, methods and data is now presented in this book. Revised, and updated Design and Optimization in Organic Synthesis presents strategies to explore experimental conditions and methodologies for systematic studies of entire reaction systems (substrates, reagent(s), catalyst(s), and solvents). Chemical phenomena are not usually the result of a single factor and this book describes how statistically designed methods can be used to analyse and evaluate synthetic procedures. The methodology is based on multivariate statistical techniques. The accompanying CD contains data tables and programmes. This book is essential reading for anyone working in process design and development in fine chemicals or the pharmaceutical industry, and is suitable for those with no experience in the field. * Contains recalculated models and redrawn figures, as well as new chapters on for example, the design of combinatorial libraries * Presents strategies to explore experimental conditions and methodologies * Enables the analysis and prediction of the best synthetic procedures How can a scientist or engineer synthesize and utilize polymers to solve our daily problems? This introductory text, aimed at the advanced undergraduate or graduate student, provides future scientists and engineers with the fundamental knowledge of polymer design and synthesis to achieve specific properties required in everyday applications. In the first five chapters, this book discusses the properties and characterization of polymers, since designing a polymer initially requires us to understand the effects of chemical structure on physical and chemical characteristics. Six further chapters discuss the principles of polymerization reactions including step, radical chain, ionic chain, chain copolymerization, coordination and ring opening. Finally, material is also included on how commonly known polymers are synthesized in a laboratory and a factory. This book is suitable for a one semester course in polymer chemistry and does not demand prior knowledge of polymer science. The definition of all space systems starts with the establishment of its fundamental parameters: requirements to be fulfilled, overall system and satellite design, analysis and design of the critical elements, developmental approach, cost, and schedule. There are only a few texts covering early design of space systems and none of them has been specifically dedicated to it. Furthermore all existing space engineering books concentrate on analysis. None of them deal with space system synthesis – with the interrelations between all the elements of the space system. Introduction to Space Systems concentrates on understanding the interaction between all the forces, both technical and non-technical, which influence the definition of a space system. This book refers to the entire system: space and ground segments, mission objectives as well as to cost, risk, and mission success probabilities. Introduction to Space Systems is divided into two parts. The first part analyzes the process of space system design in an abstract way. The second part of the book focuses on concrete aspects of the space system design process. It concentrates on interactions between design decisions and uses past design examples to illustrate these interactions. The idea is for the reader to acquire a good insight in what is a good design by analyzing these past designs. The biggest challenge in any marketplace is uncertainty. The major changes taking place in world economies, politics, and demographics has raised market uncertainty to its highest level in the past 50 years. However, with new markets opening up in emerging and developing economies, the opportunities have never been better. To compete in this challenging atmosphere, product design/redesign and manufacturing must be integrated to produce better quality products faster and cheaper. Design Synthesis: Integrated Product and Manufacturing System Design provides a conceptual framework and methodologies to do just that. The book explains how to integrate innovative product design with the

design of a batch manufacturing system. It covers the technical and social aspects of integration, presents research and best practices, and embeds integration within a framework of sustainable development. It covers the two methods for achieving design synthesis: integration and harmonisation. Product, manufacturing system, and social system architectures are integrated (united or combined to form a whole that is greater than the sum of the parts). The concurrent processes to design the architectures are harmonised (made compatible or coincident with one another). Wide in scope, the book supplies a multi-disciplinary perspective and an extensive discussion on how to maintain integrity during the design process. The authors present research and practices that are difficult or almost impossible to find. They describe the different types of system lifecycles and include guidelines on how to select the appropriate lifecycle for a specific design situation. This book promotes process design strategies and methods to chemical engineering students and encourages experienced engineers to reflect on - and perhaps challenge - their daily approach to process design. The production facilities and supply chains of the chemical industry represent complex, global systems built on sophisticated technological processes. While process design of the past could rely on steadily growing economies creating a predictable framework of product demand, raw material availability, and technological progress, today global competition, shorter product cycles, unreliable raw material supplies, and emerging, disruptive technologies create new challenges to the design of efficient, flexible, and sustainable processes. A holistic design methodology has to take care of these challenges. Process design can build on many excellent chemical engineering textbooks focusing on unit operations, process intensification, or process integration. Only a few books address the creative step finding an initial process structure. Process design methodologies constitute the main topic of this book. A special focus is given to the search for an optimal process structure (process synthesis), since an inferior process structure cannot be "upgraded" into an optimal process during later extensive optimization of process parameters regardless of the effort. The design methodology illustrated in the textbook first outlines alternate strategies to find an initial process structure (hierarchical approach or superstructure concepts with heuristic rules or mixed integer non-linear programming). The role of design targets to guide a process designer is shown for energy integration and capital investment. In a next design step, process intensification and integration are used to improve the initial process structure with respect to unit operation efficiencies (heating, cooling, and mixing) and process synergies (heat-power integration, reaction distillation, dividing wall column, etc.) resulting in superior processes. The last step of the process design methodology introduces the concept of "no-regret"- solutions. These "no-regret"-solutions aim at process designs offering a robust performance in different, future scenarios (fluctuating or unexpected product demand). Modular designs offer a powerful tool to establish highly flexible, chemical processes. The design methodology is demonstrated in a comprehensive design case dealing with 6 chemical processes integrated into a production site. The design procedure to derive process and plant structures is illustrated in a step by step approach. To a large extent, this book on process design builds on experiences of the author at Bayer Technology Services. The book includes the input of many Bayer people - technical contributions, exciting suggestions, and enlightening discussions. The book summarizes courses on "Process Intensification" and "Process Design" given by the author at the Technical University Dresden (TU Dresden - 2008), East China University of Science and Technology (ECUST Shanghai - 2012-2014) and Ruhr University Bochum (RUB - 2014-2015). This first systematic compilation of synthesis methods for different classes of polymers describes well-tested and reproducible procedures, thus saving time, money and chemicals. Each chapter presents the latest method for a specific class of conjugated polymers with a particular emphasis on the design aspects for organo-electronic applications. In this concise and practically oriented manner, readers are introduced to the strategies of influencing and controlling the polymer properties with respect to their use in the desired device. This style of presentation quickly helps researchers in their daily lab work and prevents them from reinventing the wheel over and over again. Behavioral Synthesis: A Practical Guide to High-Level Design includes details on new material and new interpretations of old material with an emphasis on practical information. The intended audience is the ASIC (or high-end FPGA) designer who will be using behavioral synthesis, the manager who will be working with those designers, or the engineering student who is studying leading-edge design techniques. Today's designs are creating tremendous pressures for digital designers. Not only must they compress more functionality onto a single IC, but this has to be done on shorter schedules to stay ahead in extremely competitive markets. To meet these opposing demands, designers must work at a new, higher level of abstraction to efficiently make the kind of architectural decisions that are critical to the success of today's complex designs. In other words, they must include behavioral design in their flow. The biggest challenge to adopting behavioral design is changing the mindset of the designer. Instead of describing system functionality in great detail, the designer outlines the design in broader, more abstract terms. The ability to easily and efficiently consider multiple design alternatives over a wide range of cost and performance is an extremely persuasive reason to make this leap to a high level of abstraction. Designers that learn to think and work at the behavioral level will reap major benefits in the resultant quality of the final design. But such changes in methodology are difficult to achieve rapidly. Education is essential to making this transition. Many designers will recall the difficulty transitioning from schematic-based design to RTL design. Designers that were new to the technology often felt that they had not been told enough about how synthesis worked and that they were not taught how to effectively write HDL code that would synthesize efficiently. Using this unique book, a designer will understand what behavioral synthesis tools are doing (and why) and how to effectively describe their designs that they are appropriately synthesized. CD ROM INCLUDED! The accompanying CD-ROM contains the source code and test benches for the three case studies discussed in Chapters 14, 15 and 16. Unlike most engineers, system engineers focus on the knowledge base needed to develop good systems in a cross-functional fashion rather than deeply on isolated topics. They are often said to be a mile wide and an inch deep in what they do know. System Synthesis: Product and Process Design provides insight into complex problems, focusing on the boun Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes is an edited collection of contributions from leaders in their field. It takes a holistic view of sustainability in chemical and process engineering design, and incorporates economic analysis and human dimensions. Ruiz-Mercado and Cabezas have brought to this book their experience of researching sustainable process design and life cycle sustainability evaluation to assist with development in government, industry and academia. This book takes a practical, step-by-step approach to designing sustainable plants and processes by starting from chemical engineering fundamentals. This method enables readers to achieve new process design approaches with high influence and less complexity. It will also help to incorporate sustainability at the early stages of project life, and build up multiple systems level perspectives. Ruiz-Mercado and Cabezas' book is the only book on the market that looks at process sustainability from a chemical engineering fundamentals perspective. Improve plants, processes and products with sustainability in mind; from conceptual design to life cycle assessment Avoid retro fitting costs by planning for sustainability concerns at the start of the design process Link sustainability to the chemical engineering fundamentals Synthesis and Operability Strategies for Computer-Aided Modular Process intensification presents state-of-the-art methodological developments and real-world applications for computer-aided process modeling, optimization and control, with a particular interest on process intensification systems. Each chapter consists of basic principles, model formulation, solution algorithm, and step-by-step implementation guidance on key procedures. Sections cover an overview on the current status of process intensification technologies, including challenges and opportunities, detail process synthesis, design and optimization, the operation of intensified processes under uncertainty, and the integration of design, operability and control. Advanced operability analysis, inherent safety analysis, and model-based control strategies developed in the community of process systems engineering are also introduced to assess process operational performance at the early design stage. Includes a survey of recent advances in modeling, optimization and control of process intensification systems Presents a modular synthesis approach for process design, integration and material selection in intensified process systems Provides advanced process operability, inherent safety tactics, and model-based control analysis approaches for the evaluation of process operational performance at the conceptual design stage Highlights a systematic framework for multiscale process design intensification integrated with operability and control Includes real-word application examples on intensified reaction and/or separation systems with targeted cost, energy and sustainability improvements This book describes simple to complex ASIC design practical scenarios using Verilog. It builds a story from the basic fundamentals of ASIC designs to advanced RTL design concepts using Verilog. Looking at current trends of miniaturization, the contents provide practical information on the issues in ASIC design and synthesis using Synopsys DC and their solution. The book explains how to write efficient RTL using Verilog and how to improve design performance. It also covers architecture design strategies, multiple clock domain designs, low-power design techniques, DFT, pre-layout STA and the overall ASIC design flow with case studies. The contents of this book will be useful to practicing hardware engineers, students, and hobbyists looking to learn about ASIC design and synthesis. This book brings together some of the most influential pieces of research undertaken around the world in design synthesis. It is the first comprehensive work of this kind and covers all three aspects of research in design synthesis: - understanding what constitutes and influences synthesis; - the major approaches to synthesis; - the diverse range of tools that are created to support this crucial design task. With its range of tools and methods covered, it is an ideal introduction to design synthesis for those intending to research in this area as well as being a valuable source of ideas for educators and practitioners of engineering design. The Leading Integrated Chemical Process Design Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details—and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process troubleshooting and "debottlenecking" Chemical engineering design and society: ethics, professionalism, health, safety, and new "green engineering" techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and appendixes with current equipment cost data and preliminary design information for eleven chemical processes—including seven brand new to this edition. The demands of increasingly complex embedded systems and associated performance computations have resulted in the development of heterogeneous computing architectures that often integrate several types of processors, analog and digital electronic components, and mechanical and optical components—all on a single chip. As a result, now the most prominent challenge for the design automation community is to efficiently plan for such heterogeneity and to fully exploit its capabilities. A compilation of work from internationally renowned authors, Model-Based Design for Embedded Systems elaborates on related practices and addresses the main facets of heterogeneous model-based design for embedded systems, including the current state of the art, important challenges, and the latest trends. Focusing on computational models as the core design artifact, this book presents the cutting-edge results that have helped establish model-based design and continue to expand its parameters. The book is organized into three sections: Real-Time and Performance Analysis in Heterogeneous Embedded Systems, Design Tools and Methodology for Multiprocessor System-on-Chip, and Design Tools and Methodology for Multidomain Embedded Systems. The respective contributors share their considerable expertise on the automation of design refinement and how to relate properties throughout this refinement while enabling analytic and synthetic qualities. They focus on multi-core methodological issues, real-time analysis, and modeling and validation, taking into account how optical, electronic, and mechanical components often interface. Model-based design is emerging as a solution to bridge the gap between the availability of computational capabilities and our inability to make full use of them yet. This approach enables teams to start the design process using a high-level model that is gradually refined through abstraction levels to ultimately yield a prototype. When executed well, model-based design encourages enhanced performance and quicker time to market for a product. Illustrating a broad and diverse spectrum of applications such as in the automotive aerospace, health care, consumer electronics, this volume provides designers with practical, readily adaptable modeling solutions for their own practice. This book describes RTL design using Verilog, synthesis and timing closure for System On Chip (SOC) design blocks. It covers the complex RTL design scenarios and challenges for SOC designs and provides practical information on performance improvements in SOC, as well as Application Specific Integrated Circuit (ASIC) designs. Prototyping using modern high density Field Programmable Gate Arrays (FPGAs) is discussed in this book with the practical examples and case studies. The book discusses SOC design, performance improvement techniques, testing and system level verification, while also describing the modern Intel FPGA/XILINX FPGA architectures and their use in SOC prototyping. Further, the book covers the Synopsys Design Compiler (DC) and Prime Time (PT) commands, and how they can be used to optimize complex ASIC/SOC designs. The contents of this book will be useful to students and professionals alike. This book aims to overview the role of non-covalent interactions, such as hydrogen and halogen bonding, π - π , π -anion and electrostatic interactions, hydrophobic effects and van der Waals forces in the synthesis of organic and inorganic compounds, as well as in design of new crystals and function materials. The proposed book should allow to combine, in a systematic way, recent advances on the application of non-covalent interactions in synthesis and design of new compounds and functional materials with significance in Inorganic, Organic, Coordination, Organometallic, Pharmaceutical, Biological and Material Chemistries. Therefore, it should present a multi- and interdisciplinary character assuring a rather broad scope. We believe it will be of interest to a wide range of academic and research staff concerning the synthesis of new compounds, catalysis and materials. Each chapter will be written by authors who are well known experts in their respective fields. This two-colored textbook presents not only synthetic ways to design organic compounds, it also contains a compilation of the most important total synthesis of the last 50 years with a comparative view of multiple designs for the same targets. It explains different tactics and strategies, making it easy to apply to many problems, regardless of the synthetic question in hand. Following a historical view of the evolution of synthesis, the book goes on to look at principles and issues impacting synthesis and design as well as principles and issues of methods. The sections on comparative design cover classics in terpenes and alkaloid synthesis, while a further section covers such miscellaneous syntheses as Maytansine, Palytoxin, Brevetoxin B and Indinavir. The whole is rounded off with a look at future perspectives and, what makes this textbook extraordinary, with personal recollections of the chemists, who synthesized these fascinating compounds. With its attractive layout highlighting key parts and tactics using a second color, this is a useful tool for organic chemists, lecturers and students in chemistry, as well as those working in the chemical industry. "I think, as will many organic chemists, that the Hudlicky book will be the Bible of synthetic organic chemistry, the past, the present and the future. A hallmark publication." (Victor Snieckus)

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