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Integrated Design and Cost Management for Civil Engineers Routledge

The many advances in food production made over the past century have made it possible to feed the whole of humanity. But food production and processing can have detrimental effects on the environment. Major challenges remain with industrial-scale Higher productivity and larger volumes should not come at the expense of product quality or animal suffering.. Food-related problems, in spite of their importance, have not been sufficiently well discussed in relation to their possible consequences. It is essential to understand the consequences of food production processes and demands of the rising standard of living can have on the food consumed daily by the world population. Of particular importance are the effects on human health and the well-being of the population, as well as the more general issues related to possible damage to the environment and ecology. This book includes contributions presented at the first international conference convened to examine these challenges. Topics include Food processing issues; Contamination of food; Pharmaceuticals in food; Obesity-related issues; Pesticides and nutrients; Hormonal effects; Food and fecundity; Genetic engineering; Freezing and thawing; Heavy metals; Pathogens; Salination problems; Desertification; Transportation problems; Traceability; Threshold values; Modern farming; Changing climate; Laws and regulations; Epidemiological studies; Water resources problems; and Animal welfare. The book will be of interest to food scientists and nutritionists, as well as agricultural, ecological, and environmental health experts interested in all these challenges.

Building Knowledge in Architecture Springer Science & Business Media

INTELLIGENT RENEWABLE ENERGY SYSTEMS This collection of papers on artificial intelligence and other methods for improving renewable energy systems, written by industry experts, is a reflection of the state of the art, a must-have for engineers, maintenance personnel, students, and anyone else wanting to stay abreast with current energy systems concepts and technology. Renewable energy is one of the most important subjects being studied, researched, and advanced in today ' s world. From a macro level, like the stabilization of the entire world ' s economy, to the micro level, like how you are going to heat or cool your home tonight, energy, specifically renewable energy, is on the forefront of the discussion. This book illustrates modelling, simulation, design and control of renewable energy systems employed with recent artificial intelligence (AI) and optimization techniques for performance enhancement. Current renewable energy sources have less power conversion efficiency because of its intermittent and fluctuating behavior. Therefore, in this regard, the recent AI and optimization techniques are able to deal with data ambiguity, noise, imprecision, and nonlinear behavior of renewable energy sources more efficiently compared to classical soft computing techniques. This book provides an extensive analysis of recent state of the art AI and optimization techniques applied to green energy systems. Subsequently, researchers, industry persons, undergraduate and graduate students involved in green energy will greatly benefit from this comprehensive volume, a must-have for any library. Audience Engineers, scientists, managers, researchers, students, and other professionals working in the field of renewable energy.

Exercises and Solutions in Statistical Theory John Wiley & Sons

The full-color, practical guide to designing sustainable residential landscapes and small-scale sites "Going green" is no longer a choice; it's a necessity. Developed landscapes have played a significant role in exacerbating the environmental and social problems that threaten humanity; however, they can also be part of the solution. Designing the Sustainable Site: Integrated Design Strategies for Small-Scale Sites and Residential Landscapes gives site designers and landscape architects the tools and information they need to become a driving force in the quest for sustainability. Advocating a regenerative design approach in which built landscapes sustain and restore vital ecological functions, this book guides readers through a design process for new and redeveloped sites that not only minimizes damage to the environment but also actively helps to repair it. Designing the Sustainable Site: Assists designers in identifying and incorporating sustainable practices that have the greatest positive impact on both the project and the surrounding community, within a regional context Uses photographs, sketches, and case studies to provide a comprehensive look at successful green landscape design Illustrates how sustainable practices are relevant and applicable to projects of any size or budget Demonstrates how built environments can protect and restore ecosystem services Explains the multiple and far-reaching benefits that sustainable design solutions can provide Assists project teams in fulfilling credit requirements of green building assessment tools, such as LEED, BREEAM, or SITES With attention to six global environmental challenges including air pollution, urban flooding and water pollution, water shortages, invasive species, and loss of biodiversity along with guidance on how to meet these challenges, Designing the Sustainable Site is a practical design manual for sustainable alternatives to small-scale site and residential landscape design.

Food and Environment Routledge

Modelled on the concept of Industry 4.0, the idea of Construction 4.0 is based on a confluence of trends and technologies that promise to reshape the way built environment assets are designed, constructed, and operated. With the pervasive use of Building Information Modelling (BIM), lean principles, digital technologies, and offsite construction, the industry is at the cusp of this transformation. The critical challenge is the fragmented state of teaching, research, and professional practice in the built environment sector. This handbook aims to overcome this fragmentation by describing Construction 4.0 in the context of its current state, emerging trends and technologies, and the people and process issues that surround the coming transformation. Construction 4.0 is a framework that is a confluence and convergence of the following broad themes discussed in this book: Industrial production (prefabrication, 3D printing and assembly, offsite manufacture) Cyber-physical systems (actuators, sensors, IoT, robots, cobots, drones) Digital and computing technologies (BIM, video and laser scanning, AI and cloud computing, big data and data analytics, reality capture, Blockchain, simulation, augmented reality, data standards and interoperability, and vertical and horizontal integration) The aim of this handbook is to describe the Construction 4.0 framework and consequently highlight the resultant processes and practices that allow us to plan, design, deliver, and operate built environment assets more effectively and efficiently by focusing on the physical-to-digital transformation and then digital-to-physical transformation. This book is essential reading for all built environment and AEC stakeholders who need to get to grips with the technological transformations currently shaping their industry, research, and teaching.

Fundamentals of Integrated Design for Sustainable Building John Wiley & Sons

This book reports on innovative concepts and practical solutions at the intersection between engineering design, engineering production and industrial management. It covers cutting-edge design, modeling and control of dynamic and multiphysics systems, knowledge management systems in industry 4.0, cyber-physical production systems, additive and sustainable manufacturing and many other related topics. The original, carefully selected, peer-reviewed chapters highlight collaborative works between different countries and between industry and universities, thus offering a timely snapshot for the research and industrial communities alike, as well as a bridge to facilitate communication and collaboration.

Integrated Design in Contemporary Architecture Rowman & Littlefield

Integrated Design of Multiscale, Multifunctional Materials and Products is the first of its type to consider not only design of materials, but concurrent design of materials and products. In other words, materials are not just selected on the basis of properties, but the composition and/or microstructure is designed to satisfy specific ranged sets of performance requirements. This book presents the motivation for pursuing concurrent design of materials and products, thoroughly discussing the details of multiscale modeling and multilevel robust design and provides details of the design methods/strategies along with selected examples of designing material attributes for specified system performance. It is intended as a monograph to serve as a foundational reference for instructors of courses at the senior and introductory graduate level in departments of materials science and engineering, mechanical engineering, aerospace engineering and civil engineering who are interested in next generation systems-based design of materials. - First of its kind to consider not only design of materials, but concurrent design of materials and products - Treatment of uncertainty via robust design of materials - Integrates the "materials by design approach" of Olson/Ques Tek LLC with the "materials selection" approach of Ashby/Granta - Distinguishes the processes of concurrent design of materials and products as an overall systems design problem from the field of multiscale modeling - Systematic mathematical algorithms and methods are introduced for robust design of materials, rather than ad hoc heuristics--it is oriented towards a true systems approach to design of materials and products

Design Solutions for nZEB Retrofit Buildings Lulu.com

The discipline of user experience (UX) design has matured into a confident practice and this edition reflects, and in some areas accelerates, that evolution. Technically this is the second edition of The UX Book, but so much of it is new, it is more like a sequel. One of the major positive trends in UX is the continued emphasis on design—a kind of design that highlights the designer's creative skills and insights and embodies a synthesis of technology with usability, usefulness, aesthetics, and meaningfulness to the user. In this edition a new conceptual top-down design framework is introduced to help readers with this evolution. This entire edition is oriented toward an agile UX lifecycle process, explained in the funnel model of agile UX, as a better match to the now de facto standard agile approach to software engineering. To reflect these trends, even the subtitle of the book is changed to "Agile UX design for a quality user experience. Designed as a how-to-do-it handbook and field guide for UX professionals and a textbook for aspiring students, the book is accompanied by in-class exercises and team projects. The approach is practical rather than formal or theoretical. The primary goal is still to imbue an understanding of what a good user experience is and how to achieve it. To better serve this, processes, methods, and techniques are introduced early to establish process-related concepts as context for discussion in later chapters. - Winner of a 2020 Textbook Excellence Award (College) (Texty) from the Textbook and Academic Authors Association - A comprehensive textbook for UX/HCI/Interaction Design students readymade for the classroom, complete with instructors' manual, dedicated web site, sample syllabus, examples, exercises, and lecture slides - Features HCI theory, process, practice, and a host of real world stories and contributions from industry luminaries to prepare students for working in the field - The only HCI textbook to cover agile methodology, design approaches, and a full, modern suite of classroom material (stemming from tried and tested classroom use by the authors)

Proceedings of the 6th International Conference on Axiomatic Design Routledge

"Foqué establishes a general design theory based on the axioms of pragmatic thinking, a crucial unity between experience and the process of learning, and between conceptual thought and situational consciousness. Building Knowledge develops a theoretical framework and practical instrumentation to establish a knowledge base for the discipline of architecture. Part one of the book presents design methods as a third way of investigating reality apart from scientific methods or the conception of art. By describing the science-philosophical context, Foqué extensively analyses the nature of design activity and the design process, its inherent characteristics, and the differences between science and art. As such, it is argued that design processes have a research dimension in sich, which are essentially contextual and action driven. Foqué offers an integrated and comprehensive perspective to understand design activity both from an epistemological and practical standpoint. This results in an expanded discourse about the true nature of architectural design processes. Within this theoretical framework, part two explains how case study research is a primordial means to establish a knowledge base for the discipline and profession of architecture. From this premise, Foqué compares case study research in law, medicine and business administration and develops a practical and comprehensive approach to case studies in architecture. The methodology offers a solid and general

framework wherein a consistent body of knowledge regarding architectural design processes can be generated. This promotes deeper insight in the complex relationship between context, product and process, which governs every design process on the one hand, and between the several stakeholders involved on the other hand."--Publisher.

Engineering Chelsea Green Publishing

Analyze and Solve Real-World Machine Design Problems Using SI Units Mechanical Design of Machine Components, Second Edition: SI Version strikes a balance between method and theory, and fills a void in the world of design. Relevant to mechanical and related engineering curricula, the book is useful in college classes, and also serves as a reference for practicing engineers. This book combines the needed engineering mechanics concepts, analysis of various machine elements, design procedures, and the application of numerical and computational tools. It demonstrates the means by which loads are resisted in mechanical components, solves all examples and problems within the book using SI units, and helps readers gain valuable insight into the mechanics and design methods of machine components. The author presents structured, worked examples and problem sets that showcase analysis and design techniques, includes case studies that present different aspects of the same design or analysis problem, and links together a variety of topics in successive chapters. SI units are used exclusively in examples and problems, while some selected tables also show U.S. customary (USCS) units. This book also presumes knowledge of the mechanics of materials and material properties. New in the Second Edition: Presents a study of two entire real-life machines Includes Finite Element Analysis coverage supported by examples and case studies Provides MATLAB solutions of many problem samples and case studies included on the book's website Offers access to additional information on selected topics that includes website addresses and open-ended web-based problems Class-tested and divided into three sections, this comprehensive book first focuses on the fundamentals and covers the basics of loading, stress, strain, materials, deflection, stiffness, and stability. This includes basic concepts in design and analysis, as well as definitions related to properties of engineering materials. Also discussed are detailed equilibrium and energy methods of analysis for determining stresses and deformations in variously loaded members. The second section deals with fracture mechanics, failure criteria, fatigue phenomena, and surface damage of components. The final section is dedicated to machine component design, briefly covering entire machines. The fundamentals are applied to specific elements such as shafts, bearings, gears, belts, chains, clutches, brakes, and springs.

Integrated Management Systems Butterworth-Heinemann

Containing papers presented at the 7th International Conference on Energy and Sustainability, this volume includes collaborative research between different disciplines, including materials, energy networks, new energy resources, storage solutions, waste to energy systems, smart grids and many other related subjects. Energy production and distribution matters as well as the need to respond to the modern world's dependency on conventional fuels are topics of growing importance. The use of fossil fuels has generated an increasing amount of interest in renewable energy resources and the search for maintainable energy policies. Energy policies and management are of primary importance to achieve the development of sustainability and need to be consistent with recent advances in energy production and distribution. Challenges lie as much in the conversion from renewable energies such as wind and solar to useful forms like electricity, heat and fuel at an acceptable cost (including environmental damage) as in the integration of these resources into an existing infrastructure. A range of topics are covered, including: Energy policies; Renewable energy resources; Sustainable energy production; Environmental risk management; Green buildings; Energy storage; Energy management; Biomass and biofuels; Waste to energy; Processing of oil and gas; CO2 capturing and management; Pipelines; Energy efficiency; Smart grids; Energy and transport; Case studies.

Design with Climate John Wiley & Sons

This report reviews engineering's importance to human, economic, social and cultural development and in addressing the UN Millennium Development Goals. Engineering tends to be viewed as a national issue, but engineering knowledge, companies, conferences and journals, all demonstrate that it is as international as science. The report reviews the role of engineering in development, and covers issues including poverty reduction, sustainable development, climate change mitigation and adaptation. It presents the various fields of engineering around the world and is intended to identify issues and challenges facing engineering, promote better understanding of engineering and its role, and highlight ways of making engineering more attractive to young people, especially women.--Publisher's description.

Variation-Aware Design of Custom Integrated Circuits: A Hands-on Field Guide Routledge

A practical guide to the effects of radiation on semiconductor components of electronic systems, and techniques for the designing, laying out, and testing of hardened integrated circuits This book teaches the fundamentals of radiation environments and their effects on electronic components, as well as how to design, lay out, and test cost-effective hardened semiconductor chips not only for today's space systems but for commercial terrestrial applications as well. It provides a historical perspective, the fundamental science of radiation, and the basics of semiconductors, as well as radiation-induced failure mechanisms in semiconductor chips. Integrated Circuits Design for Radiation Environments starts by introducing readers to semiconductors and radiation environments (including space, atmospheric, and terrestrial environments) followed by circuit design and layout. The book introduces radiation effects phenomena including single-event effects, total ionizing dose damage and displacement damage) and shows how technological solutions can address both phenomena. Describes the fundamentals of radiation environments and their effects on electronic components Teaches readers how to design, lay out and test cost-effective hardened semiconductor chips for space systems and commercial terrestrial applications Covers natural and man-made radiation environments, space systems and commercial terrestrial applications Provides up-to-date coverage of state-of-the-art of radiation hardening technology in one concise volume Includes questions and answers for the reader to test their knowledge Integrated Circuits Design for Radiation Environments will appeal to researchers and product developers in the semiconductor, space, and defense industries, as well as electronic engineers in the medical field. The book is also helpful for system, layout, process, device, reliability, applications, ESD, latchup and circuit design semiconductor engineers, along with anyone involved in micro-electronics used in harsh environments.

Achieving High-Performance Federal Facilities John Wiley & Sons

"Fundamentals of Integrated Design for Sustainable Building offers an introduction to green building concepts as well as design approaches that reduce and can eventually eliminate the need for fossil fuel use in buildings while also conserving materials, maximizing their efficiency, protecting the indoor air from chemical intrusion, and reducing the introduction of toxic materials into the environment. It represents a necessary road map to the future designers, builders, and planners of a post-carbon world." —from the Foreword by Ed Mazria A rich sourcebook covering the breadth of environmental building, Fundamentals of Integrated Design for Sustainable Building introduces the student and practitioner to the history, theory and technology of green building. Using an active learning approach, the concepts of sustainable

architecture are explained and reinforced through design problems, research exercises, study questions, team projects, and discussion topics. Chapters by specialists in the green movement round out this survey of all the important issues and developments that students and professionals need to know. From history and philosophy to design technologies and practice, this sweeping resource is sure to be referenced until worn out.

BIM and Integrated Design Princeton Architectural Press

"Ready or not, it's high time to make BIM a part of your practice, or at least your vocabulary, and this book has as much to offer beginners as it does seasoned users of building information modeling software." —Chicago Architect The first book devoted to the subject of how BIM affects individuals and organizations working within the ever-changing construction industry, BIM and Integrated Design discusses the implementation of building information modeling software as a cultural process with a focus on the technology's impact and transformative effect—both potentially disruptive and liberating—on the social, psychological, and practical aspects of the workplace. BIM and Integrated Design answers the questions that BIM poses to the firm that adopts it. Through thorough research and a series of case study interviews with industry leaders—and leaders in the making out from behind the monitor—BIM and Integrated Design helps you learn: Effective learning strategies for fully understanding BIM software and its use Key points about integrated design to help you promote the process to owners and your team How BIM changes not only the technology, process, and delivery but also the leadership playing field How to become a more effective leader no matter where you find yourself in the organization or on the project team How the introduction of BIM into the workforce has significant education, recruitment, and training implications Covering all of the human issues brought about or exacerbated by the advent of BIM into the architecture workplace, profession, and industry, BIM and Integrated Design shows how to overcome real and perceived barriers to its use.

Integrated Security Technologies and Solutions - Volume I ASP / VUBPRESS / UPA

The Building Enclosure Sustainability Symposium (BESS) was initiated in 2009 through a partnership of the Department of Architecture at California State Polytechnic University Pomona and Simpson Gumpertz & Heger Inc. The symposium was designed to bring together professionals from academia, architecture, engineering and construction, as well as students, to discuss state-of-the-art sustainable building enclosure design.

Technology, Design and Process Innovation in the Built Environment Cisco Press

Both professionals and students are increasingly committed to achieving high-performance metrics in the design, construction and operation of residential buildings. This book responds to this demand by offering a comprehensive guide which features: architectural innovations in building skin technologies which make lighter more transparent buildings high performing energy-free architectural design principles and advances in building-integrated photovoltaics essential engineering principles, controls and approaches to simulation for achieving net zero the advantages of integrated design in residential construction and the challenges and opportunities it engenders detailed case studies of innovative homes which have incorporated low-energy design solutions, new materials, alternative building assemblies, digital fabrication, integrated engineering systems and operational controls. Divided into four parts, the book discusses the requisite AEC (Architecture, Engineering and Construction) knowledge needed when building a high-performance home. It also communicates this information across four case studies, which provide the reader with a thorough overview of all aspects to be considered in the design and construction of sustainable homes. With contributions from experts in the field, the book provides a well-rounded and multi-faceted approach. This book is essential reading for students and professionals in design, architecture, engineering (civil, mechanical and electrical), construction and energy management.

Neonatal Monitoring Technologies Earthscan

Although the disciplines of architecture and structural engineering have both experienced their own historical development, their interaction has resulted in many fascinating and delightful structures. To take this interaction to a higher level, there is a need to stimulate the inventive and creative design of architectural structures and to persua

Designing the Sustainable Site Springer

Three-Dimensional Integrated Circuit Design, Second Edition, expands the original with more than twice as much new content, adding the latest developments in circuit models, temperature considerations, power management, memory issues, and heterogeneous integration. 3-D IC experts Pavlidis, Savidis, and Friedman cover the full product development cycle throughout the book, emphasizing not only physical design, but also algorithms and system-level considerations to increase speed while conserving energy. A handy, comprehensive reference or a practical design guide, this book provides effective solutions to specific challenging problems concerning the design of three-dimensional integrated circuits. Expanded with new chapters and updates throughout based on the latest research in 3-D integration: - Manufacturing techniques for 3-D ICs with TSVs - Electrical modeling and closed-form expressions of through silicon vias - Substrate noise coupling in heterogeneous 3-D ICs - Design of 3-D ICs with inductive links - Synchronization in 3-D ICs - Variation effects on 3-D ICs - Correlation of WID variations for intra-tier buffers and wires - Offers practical guidance on designing 3-D heterogeneous systems - Provides power delivery of 3-D ICs - Demonstrates the use of 3-D ICs within heterogeneous systems that include a variety of materials, devices, processors, GPU-CPU integration, and more - Provides experimental case studies in power delivery, synchronization, and thermal characterization **Manufacturing Integrated Design** Springer

This book targets custom IC designers who are encountering variation issues in their designs, especially for modern process nodes at 45nm and below, such as statistical process variations, environmental variations, and layout effects. It teaches them the state-of-the-art in Variation-Aware Design tools, which help the designer to analyze quickly the variation effects, identify the problems, and fix the problems. Furthermore, this book describes the algorithms and algorithm behavior/performance/limitations, which is of use to designers considering these tools, designers using these tools, CAD researchers, and CAD managers.

Integrated Design of Multiscale, Multifunctional Materials and Products IGI Global

Architects today incorporate principles of sustainable design as a matter of necessity. But the challenge of unifying climate control and building functionality, of securing a managed environment within a natural setting—and combating the harsh forces of wind, water, and sun—presented a new set of obstacles to architects and engineers in the mid-twentieth century. First published in 1963, Design with Climate was one of the most pioneering books in the field and remains an important reference for practitioners, teachers, and students, over fifty years

later. In this book, Victor Olgyay explores the impact of climate on shelter design, identifying four distinct climatic regions and explaining the effect of each on orientation, air movement, site, and materials. He derives principles from biology, engineering, meteorology, and physics, and demonstrates how an analytical approach to climate management can merge into a harmonious and aesthetically sound design concept. This updated edition contains four new essays that provide unique insights on issues of climate design, showing how Olgyay's concepts work in contemporary practice. Ken Yeang, John Reynolds, Victor W. Olgyay, and Donlyn Lyndon explore bioclimatic design, eco design, and rational regionalism, while paying homage to Olgyay's impressive groundwork and contributions to the field of architecture.