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Safety of Lithium Batteries describes how best to assure safety during all phases of the life of Lithium ion batteries (production, transport, use, and disposal). About 5 billion Li-ion cells are produced each year, predominantly for use in consumer electronics. This book describes how the high-energy density and outstanding performance of Li-ion batteries will result in a large increase in the production of Li-ion cells for electric drive train vehicle (xEV) and battery energy storage (BES or EES) purposes. The high-energy density of Li battery systems comes with special hazards related to the materials employed in these systems. The manufacturers of cells and batteries have strongly reduced the hazard probability by a number of measures. However, absolute safety of the Li system is not given as multiple incidents in consumer electronics have shown. Presents the relationship between chemical and structure material properties and cell safety Relates cell and battery design to safety as well as system operation parameters to safety Outlines the influences of abuses on safety and the relationship to battery testing Explores the limitations for transport and storage of cells and batteries Includes recycling, disposal and second use of lithium ion batteries The book compiles the research works related to smart solutions concept in context to smart energy systems, maintaining electrical grid discipline and resiliency, computational collective intelligence consisted of interaction between smart devices, smart environments and smart interactions, as well as information technology support for

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such areas. It includes high-quality papers presented in the International Conference on Intelligent Computing Techniques for Smart Energy Systems organized by Manipal University Jaipur. This book will motivate scholars to work in these areas. The book also prophesies their approach to be used for the business and the humanitarian technology development as research proposal to various government organizations for funding approval.

"Institute of Electrical and Electronics Engineers."

This book presents a comprehensive set of guidelines and applications of DlgSILENT PowerFactory, an advanced power system simulation software package, for different types of power systems studies. Written by specialists in the field, it combines expertise and years of experience in the use of DlgSILENT PowerFactory with a deep understanding of power systems analysis. These complementary approaches therefore provide a fresh perspective on how to model, simulate and analyse power systems. It presents methodological approaches for modelling of system components, including both classical and non-conventional devices used in generation, transmission and distribution systems, discussing relevant assumptions and implications on performance assessment. This background is complemented with several guidelines for advanced use of DSL and DPL languages as well as for interfacing with other software packages, which is of great value for creating and performing different types of steady-state and dynamic performance simulation analysis. All employed test case studies are provided as supporting material to the reader to ease recreation of all examples presented in the book as well as to facilitate their use in other cases related to planning and operation studies. Providing an invaluable resource for the formal instruction of power system undergraduate/postgraduate students, this book is also a

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useful reference for engineers working in power system operation and planning.

Embedded Microcomputer Systems: Real Time Interfacing provides an in-depth discussion of the design of real-time embedded systems using 9S12 microcontrollers. This book covers the hardware aspects of interfacing, advanced software topics (including interrupts), and a systems approach to typical embedded applications. This text stands out from other microcomputer systems books because of its balanced, in-depth treatment of both hardware and software issues important in real time embedded systems design. It features a wealth of detailed case studies that demonstrate basic concepts in the context of actual working examples of systems. It also features a unique simulation software package on the bound-in CD-ROM (called Test Execute and Simulate, or TExaS, for short) that provides a self-contained software environment for designing, writing, implementing, and testing both the hardware and software components of embedded systems. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This classic text offers you the key to understanding short circuits, open conductors and other problems relating to electric power systems that are subject to unbalanced conditions. Using the method of symmetrical components, acknowledged expert Paul

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M. Anderson provides comprehensive guidance for both finding solutions for faulted power systems and maintaining protective system applications. You'll learn to solve advanced problems, while gaining a thorough background in elementary configurations. Features you'll put to immediate use: Numerous examples and problems Clear, concise notation Analytical simplifications Matrix methods applicable to digital computer technology Extensive appendices Diskette files can now be found by entering in ISBN 978-0780311459 on booksupport.wiley.com.

Offering radar-related software for the analysis and design of radar waveform and signal processing, *Radar Signal Analysis and Processing Using MATLAB®* provides a comprehensive source of theoretical and practical information on radar signals, signal analysis, and radar signal processing with companion MATLAB® code. After an overview of radar systems operation and design, the book reviews elements of signal theory relevant to radar detection and radar signal processing, along with random variables and processes. The author then presents the unique characteristic of the matched filter and develops a general formula for the output of the matched filter that is valid for any waveform. He analyzes several analog waveforms, including the linear frequency modulation pulse and stepped frequency waveforms, as well as unmodulated pulse-train, binary, polyphase, and frequency codes. The

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book explores radar target detection and pulse integration, emphasizing the constant false alarm rate. It also covers the stretch processor, the moving target indicator, radar Doppler processing, beamforming, and adaptive array processing. Using configurable MATLAB code, this book demonstrates how to apply signal processing to radar applications. It includes many examples and problems to illustrate the practical application of the theory.

Simulation is integral to the successful design of modern radar systems, and there is arguably no better software for this purpose than MATLAB. But software and the ability to use it does not guarantee success. One must also: Understand radar operations and design philosophy Know how to select the radar parameters to meet the design req
TimetablePower System Protective RelayingCRC Press

Get more out of Microsoft Power BI turning your data into actionable insights About This Book From connecting to your data sources to developing and deploying immersive, mobile-ready dashboards and visualizations, this book covers it all Over 90 hands-on, technical recipes, tips, and use cases from across the Power BI platform including the Power BI Service and Mobile Applications Proven development techniques and guidance for implementing custom solutions with DAX and M languages Who This Book Is For This book is for BI professionals who wish to enhance their knowledge of Power BI beyond and to enhance the value of the Power

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BI solutions they deliver to business users. Those who are looking at quick solutions to common problems while using Power BI will also find this book to be a very useful resource. Some experience with Power BI will be useful. What You Will Learn Cleanse, stage, and integrate your data sources with Power BI Abstract data complexities and provide users with intuitive, self-service BI capabilities Build business logic and analysis into your solutions via the DAX programming language and dynamic, dashboard-ready calculations Take advantage of the analytics and predictive capabilities of Power BI Make your solutions more dynamic and user specific and/or defined including use cases of parameters, functions, and row level security Understand the differences and implications of DirectQuery, Live Connections, and Import-Mode Power BI datasets and how to deploy content to the Power BI Service and schedule refreshes Integrate other Microsoft data tools such as Excel and SQL Server Reporting Services into your Power BI solution In Detail Microsoft Power BI is a business intelligence and analytics platform consisting of applications and services designed to provide coherent, visual and interactive insights of data. This book will provide thorough, technical examples of using all primary Power BI tools and features as well as demonstrate high impact end-to-end solutions that leverage and integrate these technologies and services. Get familiar with Power BI development tools and services, go deep into the data connectivity and transformation, modeling, visualization and analytical capabilities of Power BI, and see Power BI's functional programming languages of DAX and M

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come alive to deliver powerful solutions to address common, challenging scenarios in business intelligence. This book will excite and empower you to get more out of Power BI via detailed recipes, advanced design and development tips, and guidance on enhancing existing Power BI projects. Style and approach This book consists of practical recipes on Power BI that target novices as well as intermediate Power BI users. It goes deep into the technical issues, covers additional protocols, and many more real-live examples.

Drug overdose, driven largely by overdose related to the use of opioids, is now the leading cause of unintentional injury death in the United States. The ongoing opioid crisis lies at the intersection of two public health challenges: reducing the burden of suffering from pain and containing the rising toll of the harms that can arise from the use of opioid medications. Chronic pain and opioid use disorder both represent complex human conditions affecting millions of Americans and causing untold disability and loss of function. In the context of the growing opioid problem, the U.S. Food and Drug Administration (FDA) launched an Opioids Action Plan in early 2016. As part of this plan, the FDA asked the National Academies of Sciences, Engineering, and Medicine to convene a committee to update the state of the science on pain research, care, and education and to identify actions the FDA and others can take to respond to the opioid epidemic, with a particular focus on informing FDA's development of a formal method for incorporating individual and societal considerations into its risk-benefit framework for opioid approval and

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monitoring.

"Alexander and Sadiku's sixth edition of Fundamentals of Electric Circuits continues in the spirit of its successful previous editions, with the objective of presenting circuit analysis in a manner that is clearer, more interesting, and easier to understand than other, more traditional texts. Students are introduced to the sound, six-step problem solving methodology in chapter one, and are consistently made to apply and practice these steps in practice problems and homework problems throughout the text."--Publisher's website.

Officially, the use of biomass for energy meets only 10-13% of the total global energy demand of 140 000 TWh per year. Still, thirty years ago the official figure was zero, as only traded biomass was included. While the actual production of biomass is in the range of 270 000 TWh per year, most of this is not used for energy purposes, and mostly it is not used very efficiently.

Therefore, there is a need for new methods for converting biomass into refined products like chemicals, fuels, wood and paper products, heat, cooling and electric power. Obviously, some biomass is also used as food – our primary life necessity. The different types of conversion methods covered in this volume are biogas production, bio-ethanol production, torrefaction, pyrolysis, high temperature gasification and combustion. This book covers the suitability of different methods for conversion of different types of biomass. Different versions of the conversion methods are presented – both existing methods and those being developed for the future. System optimization using modeling methods and

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simulation are analyzed to determine advantages and disadvantages of different solutions. Many international experts have contributed to provide an up-to-date view of the situation all over the world. These global perspectives and the inclusion of so much expertise of distinguished international researchers and professionals make this book unique. This book will prove useful and inspiring to professionals, engineers, researchers and students as well as to those working for different authorities and organizations.

The aim of this new book series (Diatoms: Biology and Applications) is to provide a comprehensive and reliable source of information on diatom biology and applications. The first book of the series, *Diatoms Fundamentals & Applications*, is wide ranging, starting with the contributions of amateurs and the beauty of diatoms, to details of how their shells are made, how they bend light to their advantage and ours, and major aspects of their biochemistry (photosynthesis and iron metabolism). The book then delves into the ecology of diatoms living in a wide range of habitats, and look at those few that can kill or harm us. The book concludes with a wide range of applications of diatoms, in forensics, manufacturing, medicine, biofuel and agriculture. The contributors are leading international experts on diatoms. This book is for a wide audience researchers, academics, students, and teachers of biology and related disciplines, written to both act as an introduction to diatoms and to present some of the most advanced research on them.

This book is the first systematic exposition on the emerging domain of wireless power transfer in ad

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hoc communication networks. It selectively spans a coherent, large spectrum of fundamental aspects of wireless power transfer, such as mobility management in the network, combined wireless power and information transfer, energy flow among network devices, joint activities with wireless power transfer (routing, data gathering and solar energy harvesting), and safety provisioning through electromagnetic radiation control, as well as fundamental and novel circuits and technologies enabling the wide application of wireless powering. Comprising a total of 27 chapters, contributed by leading experts, the content is organized into six thematic sections: technologies, communication, mobility, energy flow, joint operations, and electromagnetic radiation awareness. It will be valuable for researchers, engineers, educators, and students, and it may also be used as a supplement to academic courses on algorithmic applications, wireless protocols, distributed computing, and networking.

This book is a printed edition of the Special Issue "Real-Time Embedded Systems" that was published in Electronics

Includes undergraduate and graduate courses.
Introduction; Fuzzy control: the basics; Case studies in design and implementation; nonlinear analysis; Fuzzy identification and estimation; Adaptive fuzzy control; Fuzzy supervisory control; Perspectives on

fuzzy control.

This handbook offers a comprehensive source for electrical power professionals. It covers all elementary topics related to the design, development, operation and management of power systems, and provides an insight from worldwide key players in the electrical power systems industry. Edited by a renowned leader and expert in Power Systems, the book highlights international professionals' longstanding experiences and addresses the requirements of practitioners but also of newcomers in this field in finding a solution for their problems. The structure of the book follows the physical structure of the power system from the fundamentals through components and equipment to the overall system. In addition the handbook covers certain horizontal matters, for example "Energy fundamentals", "High voltage engineering", and "High current and contact technology" and thus intends to become the major one-stop reference for all issues related to the electrical power system. The book deals with the fundamentals, theoretical bases, and design methodologies of conventional internal combustion engine (ICE) vehicles, electric vehicles (EVs), hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs). The design methodology is described in mathematical terms, step-by-step, and the topics are approached from the overall drive train system, not just individual components. Furthermore,

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in explaining the design methodology of each drive train, design examples are presented with simulation results.

This book focuses on protective relaying, which is an indispensable part of electrical power systems. The recent advancements in protective relaying are being dictated by MMPRs (microprocessor-based multifunction relays). The text covers smart grids, integration of wind and solar generation, microgrids, and MPPRs as the driving aspects of innovations in protective relaying. Topics such as cybersecurity and instrument transformers are also explored. Many case studies and practical examples are included to emphasize real-world applications.

A hydrogen economy, in which this one gas provides the source of all energy needs, is often touted as the long-term solution to the environmental and security problems associated with fossil fuels. However, before hydrogen can be used as fuel on a global scale we must establish cost effective means of producing, storing, and distributing the gas, develop cost efficient technologies for converting hydrogen to electricity (e.g. fuel cells), and creating the infrastructure to support all this. Sorensen is the only text available that provides up to date coverage of all these issues at a level appropriate for the technical reader. The book not only describes the "how" and "where" aspects of hydrogen fuels cells usage, but also the obstacles and benefits of its use, as well as

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the social implications (both economically and environmental). Written by a world-renowned researcher in energy systems, this thoroughly illustrated and cross-referenced book is an excellent reference for researchers, professionals and students in the field of renewable energy. Updated sections on PEM fuel cells, Molten carbonate cells, Solid Oxide cells and Biofuel cells Updated material to reflect the growing commercial acceptance of stationary and portable fuel cell systems, while also recognizing the ongoing research in automotive fuel cell systems A new example of a regional system based on renewable energy sources reflects the growing international attention to uses of renewable energy as part of the energy grid Examples of life cycle analysis of environmental and social impacts
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