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Electrical Engineering in Context: Smart Devices, Robots & Communications - Roman Kuc 2014-03-12

ELECTRICAL ENGINEERING IN CONTEXT: SMART DEVICES, ROBOTS & COMMUNICATIONS by bestselling author Roman Kuc describes the basic components and technologies that make today's computer-assisted systems operate and cooperate, inviting the reader to understand by participating in the design process. Directed at the undergraduate electrical engineering student, this book starts with the basics and requires a working knowledge of algebra. Rather than simple plug-and-chug exercises, the book teaches sophisticated problem-solving and design tools. Students will learn through designing digital displays, extracting information from signals, and optimizing system performance through parameter value selection and observing graphical data displays. Animations showing dynamic system behavior and relating to the book figures are available through the book's companion site. At the completion of the course, students will have an understanding of the capabilities of current digital devices and ideas for possible new applications. This will benefit students in other courses requiring quantitative skills and in their profession. To help accomplish this tall order, the book is written in a graduated intensity that can be adapted to the specific needs and talents of each student: Basic commands and graphs are used in first-level problems that illustrate device performance while varying parameter values and in designs that are open-ended, driven by student curiosity. Some problems can be solved using software packages, but many exercises are for paper and pencil solution. MATLAB based examples and problems are also included for users comfortable with computer programming. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Elements of X Ray Diffraction - B. D. Cullity 2018-11-10

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Fundamentals and Applications of Magnetic Materials - Kannan M. Krishnan 2016-10-06

Students and researchers looking for a comprehensive textbook on magnetism, magnetic materials and related applications will find in this book an excellent explanation of the field. Chapters progress logically from the physics of magnetism, to magnetic phenomena in materials, to size and dimensionality effects, to applications. Beginning with a description of magnetic phenomena and measurements on a macroscopic scale, the book then presents discussions of intrinsic and phenomenological concepts of magnetism such as electronic magnetic moments and classical, quantum, and band theories of magnetic behavior. It then covers ordered magnetic materials (emphasizing their structure-sensitive properties) and magnetic phenomena, including magnetic anisotropy, magnetostriction, and magnetic domain structures and dynamics. What follows is a comprehensive description of imaging methods to resolve magnetic microstructures (domains) along with an introduction to micromagnetic modeling. The book then explores in detail size (small particles) and dimensionality (surface and interfaces) effects — the underpinnings of nanoscience and nanotechnology that are

brought into sharp focus by magnetism. The hallmark of modern science is its interdisciplinarity, and the second half of the book offers interdisciplinary discussions of information technology, magnetoelectronics and the future of biomedicine via recent developments in magnetism. Modern materials with tailored properties require careful synthetic and characterization strategies. The book also includes relevant details of the chemical synthesis of small particles and the physical deposition of ultra thin films. In addition, the book presents details of state-of-the-art characterization methods and summaries of representative families of materials, including tables of properties. CGS equivalents (to SI) are included.

Electrode Materials for Energy Storage and Conversion - Mesfin A. Kebede 2021-11-17

This book provides a comprehensive overview of the latest developments and materials used in electrochemical energy storage and conversion devices, including lithium-ion batteries, sodium-ion batteries, zinc-ion batteries, supercapacitors and conversion materials for solar and fuel cells. Chapters introduce the technologies behind each material, in addition to the fundamental principles of the devices, and their wider impact and contribution to the field. This book will be an ideal reference for researchers and individuals working in industries based on energy storage and conversion technologies across physics, chemistry and engineering. FEATURES Edited by established authorities, with chapter contributions from subject-area specialists Provides a comprehensive review of the field Up to date with the latest developments and research Editors Dr. Mesfin A. Kebede obtained his PhD in Metallurgical Engineering from Inha University, South Korea. He is now a principal research scientist at Energy Centre of Council for Scientific and Industrial Research (CSIR), South Africa. He was previously an assistant professor in the Department of Applied Physics and Materials Science at Hawassa University, Ethiopia. His extensive research experience covers the use of electrode materials for energy storage and energy conversion. Prof. Fabian I. Ezema is a professor at the University of Nigeria, Nsukka. He obtained his PhD in Physics and Astronomy from University of Nigeria, Nsukka. His research focuses on several areas of materials science with an emphasis on energy applications, specifically electrode materials for energy conversion and storage.

Solutions Manual to Accompany Electronic Properties of Engineering Materials - James D. Livingston 1999

Ceramic Materials - C. Barry Carter 2013-01-04

Ceramic Materials: Science and Engineering is an up-to-date treatment of ceramic science, engineering, and applications in a single, comprehensive text. Building on a foundation of crystal structures, phase equilibria, defects, and the mechanical properties of ceramic materials, students are shown how these materials are processed for a wide diversity of applications in today's society. Concepts such as how and why ions move, how ceramics interact with light and magnetic fields, and how they respond to temperature changes are discussed in the context of their applications. References to the art and history of ceramics are included throughout the text, and a chapter is devoted to ceramics as gemstones. This course-tested text now includes expanded chapters on the role of ceramics in industry and their impact on the environment as well as a chapter devoted to applications of ceramic materials in clean energy technologies. Also new are expanded sets of text-specific homework problems and other resources for instructors. The revised and updated Second Edition is further enhanced with color illustrations throughout the text.

Physics of Semiconductor Devices - Simon M. Sze 2006-12-13

The Third Edition of the standard textbook and reference in the field of semiconductor devices This classic book has set the standard for advanced study and reference in the semiconductor device field. Now

completely updated and reorganized to reflect the tremendous advances in device concepts and performance, this Third Edition remains the most detailed and exhaustive single source of information on the most important semiconductor devices. It gives readers immediate access to detailed descriptions of the underlying physics and performance characteristics of all major bipolar, field-effect, microwave, photonic, and sensor devices. Designed for graduate textbook adoptions and reference needs, this new edition includes: A complete update of the latest developments New devices such as three-dimensional MOSFETs, MODFETs, resonant-tunneling diodes, semiconductor sensors, quantum-cascade lasers, single-electron transistors, real-space transfer devices, and more Materials completely reorganized Problem sets at the end of each chapter All figures reproduced at the highest quality Physics of Semiconductor Devices, Third Edition offers engineers, research scientists, faculty, and students a practical basis for understanding the most important devices in use today and for evaluating future device performance and limitations. A Solutions Manual is available from the editorial department.

Electronic Devices - Thomas L. Floyd 2003

Borgnakke's Fundamentals of Thermodynamics - Richard E. Sonntag 2017-06-30

Borgnakke's FUNDAMENTALS OF THERMODYNAMICS Borgnakke's Fundamentals of Thermodynamics continues to offer a comprehensive and rigorous treatment of classical thermodynamics, while retaining an engineering perspective. With concise, applications-oriented discussion of topics and self-test problems, this text encourages students to monitor their own learning. This classic text provides a solid foundation for subsequent studies in fields such as fluid mechanics, heat transfer and statistical thermodynamics, and prepares students to effectively apply thermodynamics in the practice of engineering. This book is authorized for sale in Europe, Asia, Africa and the Middle East only and may not be exported. The content is materially different than products for other markets including the authorized U.S. counterpart of this title.

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Applied Numerical Methods with MATLAB for Engineers and Scientists - Steven C. Chapra 2008

Steven Chapra's second edition, Applied Numerical Methods with MATLAB for Engineers and Scientists, is written for engineers and scientists who want to learn numerical problem solving. This text focuses on problem-solving (applications) rather than theory, using MATLAB, and is intended for Numerical Methods users; hence theory is included only to inform key concepts. The second edition feature new material such as Numerical Differentiation and ODE's: Boundary-Value Problems. For those who require a more theoretical approach, see Chapra's best-selling Numerical Methods for Engineers, 5/e (2006), also by McGraw-Hill.

Photonics and Lasers - Richard S. Quimby 2006-04-14

An introduction to photonics and lasers that does not rely on complex mathematics This book evolved from a series of courses developed by the author and taught in the areas of lasers and photonics. This thoroughly classroom-tested work fills a unique need for students, instructors, and industry professionals in search of an introductory-level book that covers a wide range of topics in these areas. Comparable books tend to be aimed either too high or too low, or they cover only a portion of the topics that are needed for a comprehensive treatment. Photonics and Lasers is divided into four parts: * Propagation of Light * Generation and Detection of Light * Laser Light * Light-Based Communication The author has ensured that complex mathematics does not become an obstacle to understanding key physical concepts. Physical arguments and explanations are clearly set forth while, at the same time, sufficient mathematical detail is provided for a quantitative understanding. As an additional aid to readers who are learning to think symbolically, some equations are expressed in words as well as symbols. Problem sets are provided throughout the book for readers to test their knowledge and grasp of key concepts. A solutions manual is also available for instructors. Finally, the detailed bibliography leads readers to in-depth explorations of particular topics. The book's topics, lasers and photonics, are often treated separately in other texts; however, the author skillfully demonstrates their natural synergy. Because of the combined coverage, this text can be used for a two-semester course or a one-semester course emphasizing either lasers or photonics. This is a perfect introductory textbook for both undergraduate and graduate students, additionally serving as a practical

reference for engineers in telecommunications, optics, and laser electronics.

Electronic Properties of Materials - Rolf E. Hummel 2012-12-06

Books are seldom finished. At best, they are abandoned. The second edition of "Electronic Properties of Materials" has been in use now for about seven years. During this time my publisher gave me ample opportunities to update and improve the text whenever the book was reprinted. There were about six of these reprinting cycles. Eventually, however, it became clear that substantially more new material had to be added to account for the stormy developments which occurred in the field of electrical, optical, and magnetic materials. In particular, expanded sections on flat-panel displays (liquid crystals, electroluminescence devices, field emission displays, and plasma displays) were added. Further, the recent developments in blue- and green emitting LED's and in photonics are included. Magnetic storage devices also underwent rapid development. Thus, magneto-optical memories, magneto resistance devices, and new magnetic materials needed to be covered. The sections on dielectric properties, ferroelectricity, piezoelectricity, electrostriction, and thermoelectric properties have been expanded. Of course, the entire text was critically reviewed, updated, and improved. However, the most extensive change I undertook was the conversion of all equations to SI units throughout. In most of the world and in virtually all of the international scientific journals use of this system of units is required. If today's students do not learn to utilize it, another generation is "lost" on this matter. In other words, it is important that students become comfortable with SI units.

Magnetic Materials - Nicola A. Spaldin 2010-08-19

Magnetic Materials is an excellent introduction to the basics of magnetism, magnetic materials and their applications in modern device technologies. Retaining the concise style of the original, this edition has been thoroughly revised to address significant developments in the field, including the improved understanding of basic magnetic phenomena, new classes of materials, and changes to device paradigms. With homework problems, solutions to selected problems and a detailed list of references, Magnetic Materials continues to be the ideal book for a one-semester course and as a self-study guide for researchers new to the field. New to this edition: • Entirely new chapters on Exchange Bias Coupling, Multiferroic and Magnetoelectric Materials, Magnetic Insulators • Revised throughout, with substantial updates to the chapters on Magnetic Recording and Magnetic Semiconductors, incorporating the latest advances in the field • New example problems with worked solutions

Experiments in Electronic Devices - Howard M. Berlin 1988

Electricity and Magnetism, Volume 2 - BI Bleaney 2013-03-28

"Reissued (with corrections) as an Oxford classic text in 2013"--Verso title page.

Structure-Property Relations in Nonferrous Metals - Alan Russell 2005-07-08

This junior/senior textbook presents fundamental concepts of structure property relations and a description of how these concepts apply to every metallic element except iron. Part One of the book describes general concepts of crystal structure, microstructure and related factors on the mechanical, thermal, magnetic and electronic properties of nonferrous metals, intermetallic compounds and metal matrix composites. Part Two discusses all the nonferrous metallic elements from two perspectives: First it explains how the concepts presented in Part One define the properties of a particular metallic element and its alloys. Second is a description of the major engineering uses of each metal. This section features sidebar pieces describing particular physical property oddities, engineering applications and case studies. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

Solutions Manual for Quanta, Matter and Change - Peter Atkins 2009-04-17

Materials Science and Engineering - William D. Callister, Jr. 2018-02-23

Materials Science and Engineering: An Introduction promotes student understanding of the three primary types of materials (metals, ceramics, and polymers) and composites, as well as the relationships that exist between the structural elements of materials and their properties.

Microfluidics and Nanofluidics Handbook - Sushanta K. Mitra 2016-04-19 This comprehensive handbook presents fundamental aspects, fabrication

techniques, introductory materials on microbiology and chemistry, measurement techniques, and applications of microfluidics and nanofluidics. The second volume focuses on topics related to experimental and numerical methods. It also covers fabrication and applications in a variety of areas, from aerospace to biological systems. Reflecting the inherent nature of microfluidics and nanofluidics, the book includes as much interdisciplinary knowledge as possible. It provides the fundamental science background for newcomers and advanced techniques and concepts for experienced researchers and professionals.

Fundamentals of Solid State Engineering - Manijeh Razeghi
2006-06-12

Provides a multidisciplinary introduction to quantum mechanics, solid state physics, advanced devices, and fabrication Covers wide range of topics in the same style and in the same notation Most up to date developments in semiconductor physics and nano-engineering Mathematical derivations are carried through in detail with emphasis on clarity Timely application areas such as biophotonics , bioelectronics
Modern Physical Metallurgy - R. E. Smallman 2016-06-24
Modern Physical Metallurgy, Fourth Edition discusses the fundamentals and applications of physical metallurgy. The book is comprised of 15 chapters that cover the experimental background of a metallurgical phenomenon. The text first talks about the structure of atoms and crystals, and then proceeds to dealing with the physical examination of metals and alloys. The third chapter tackles the phase diagrams and solidifications, while the fourth chapter covers the thermodynamics of crystals. Next, the book discusses the structure of alloys. The next four chapters deal with the deformations and defects of crystals, metals, and alloys. Chapter 10 discusses work hardening and annealing, while Chapters 11 and 12 cover phase transformations. The succeeding two chapters talk about creep, fatigue, and fracture, while the last chapter covers oxidation and corrosion. The text will be of great use to undergraduate students of materials engineering and other degrees that deal with metallurgical properties.

Fundamentals of Semiconductors - Peter YU 2007-05-08

Excellent bridge between general solid-state physics textbook and research articles packed with providing detailed explanations of the electronic, vibrational, transport, and optical properties of semiconductors "The most striking feature of the book is its modern outlook ... provides a wonderful foundation. The most wonderful feature is its efficient style of exposition ... an excellent book." Physics Today "Presents the theoretical derivations carefully and in detail and gives thorough discussions of the experimental results it presents. This makes it an excellent textbook both for learners and for more experienced researchers wishing to check facts. I have enjoyed reading it and strongly recommend it as a text for anyone working with semiconductors ... I know of no better text ... I am sure most semiconductor physicists will find this book useful and I recommend it to them." Contemporary Physics Offers much new material: an extensive appendix about the important and by now well-established, deep center known as the DX center, additional problems and the solutions to over fifty of the problems at the end of the various chapters.

Microcontroller Theory and Applications with the PIC18F - M. Rafiquzzaman 2018-01-02

A thorough revision that provides a clear understanding of the basic principles of microcontrollers using C programming and PIC18F assembly language This book presents the fundamental concepts of assembly language programming and interfacing techniques associated with typical microcontrollers. As part of the second edition's revisions, PIC18F assembly language and C programming are provided in separate sections so that these topics can be covered independent of each other if desired. This extensively updated edition includes a number of fundamental topics. Characteristics and principles common to typical microcontrollers are emphasized. Interfacing techniques associated with a basic microcontroller such as the PIC18F are demonstrated from chip level via examples using the simplest possible devices, such as switches, LEDs, Seven-Segment displays, and the hexadecimal keyboard. In addition, interfacing the PIC18F with other devices such as LCD displays, ADC, and DAC is also included. Furthermore, topics such as CCP (Capture, Compare, PWM) and Serial I/O using C along with simple examples are also provided. Microcontroller Theory and Applications with the PIC18F, 2nd Edition is a comprehensive and self-contained book that emphasizes characteristics and principles common to typical microcontrollers. In addition, the text: Includes increased coverage of C language programming with the PIC18F I/O and interfacing techniques Provides a more detailed explanation of PIC18F timers, PWM, and Serial

I/O using C Illustrates C interfacing techniques through the use of numerous examples, most of which have been implemented successfully in the laboratory This new edition of Microcontroller Theory and Applications with the PIC18F is excellent as a text for undergraduate level students of electrical/computer engineering and computer science.
Principles of Electronic Materials and Devices - Safa Kasap 2005-03-25
Principles of Electronic Materials and Devices, Third Edition, is a greatly enhanced version of the highly successful text Principles of Electronic Materials and Devices, Second Edition. It is designed for a first course on electronic materials given in Materials Science and Engineering, Electrical Engineering, and Physics and Engineering Physics Departments at the undergraduate level. The third edition has numerous revisions that include more beautiful illustrations and photographs, additional sections, more solved problems, worked examples, and end-of-chapter problems with direct engineering applications. The revisions have improved the rigor without sacrificing the original semiquantitative approach that both the students and instructors liked and valued. Some of the new end-of-chapter problems have been especially selected to satisfy various professional engineering design requirements for accreditation across international borders. Advanced topics have been collected under Additional Topics, which are not necessary in a short introductory treatment.

Handbook of Optoelectronics - John P. Dakin 2017-10-05

Handbook of Optoelectronics offers a self-contained reference from the basic science and light sources to devices and modern applications across the entire spectrum of disciplines utilizing optoelectronic technologies. This second edition gives a complete update of the original work with a focus on systems and applications. Volume I covers the details of optoelectronic devices and techniques including semiconductor lasers, optical detectors and receivers, optical fiber devices, modulators, amplifiers, integrated optics, LEDs, and engineered optical materials with brand new chapters on silicon photonics, nanophotonics, and graphene optoelectronics. Volume II addresses the underlying system technologies enabling state-of-the-art communications, imaging, displays, sensing, data processing, energy conversion, and actuation. Volume III is brand new to this edition, focusing on applications in infrastructure, transport, security, surveillance, environmental monitoring, military, industrial, oil and gas, energy generation and distribution, medicine, and free space. No other resource in the field comes close to its breadth and depth, with contributions from leading industrial and academic institutions around the world. Whether used as a reference, research tool, or broad-based introduction to the field, the Handbook offers everything you need to get started. John P. Dakin, PhD, is professor (emeritus) at the Optoelectronics Research Centre, University of Southampton, UK. Robert G. W. Brown, PhD, is chief executive officer of the American Institute of Physics and an adjunct full professor in the Beckman Laser Institute and Medical Clinic at the University of California, Irvine.

Principles of Electrical Engineering Materials and Devices - Safa O. Kasap 1997-01-01

Principles of Electrical Engineering Materials and Devices has been developed to bridge the gap between traditional electronic circuits texts and semiconductor texts

Electronic Surveillance Devices - Paul Brookes 2001-05

Electronic Surveillance Devices is the book that security professionals, security system installers and hobbyists have been waiting for. Paul Brookes launches straight into the practicalities of electronic surveillance with plenty of clear, detailed information on building the devices that are at the heart of surveillance and counter-surveillance. Self-build electronics projects are supported by principles and a brief survey of each type of device. The second edition of this popular handbook has been extended with new material on microphones, amplifiers and transmitters. A step-by-step cookbook of electronic surveillance devices and techniques Requires only a basic electronics background Practical applications and guidance for security professionals

Solid State Electronic Devices - Ben G. Streetman 2000

"This is the fifth edition of the most widely used introductory book on semiconductor materials, physics, devices and technology. The book was written with two basic goals in mind: 1) develop the basic semiconductor physics concepts to understand current and future devices; 2) provide a sound understanding of current semiconductor devices and technology so that their applications to electronic and optoelectronic circuits and systems can be appreciated."--BOOK JACKET.Title Summary field provided by Blackwell North America, Inc. All Rights Reserved

Essentials of Chemical Reaction Engineering - H. Scott Fogler 2011
Accompanying DVD-ROM contains many realistic, interactive simulations.

Field and Wave Electromagnetics - Cheng 1989-09

Optoelectronics and Photonics - Safa O. Kasap 2013

For one-semester, undergraduate-level courses in Optoelectronics and Photonics, in the departments of electrical engineering, engineering physics, and materials science and engineering. This text takes a fresh look at the enormous developments in electro-optic devices and associated materials.

Kinetics in Materials Science and Engineering - Dennis W. Readey 2017-01-27

"A pedagogical gem.... Professor Readey replaces 'black-box' explanations with detailed, insightful derivations. A wealth of practical application examples and exercise problems complement the exhaustive coverage of kinetics for all material classes." -Prof. Rainer Hebert, University of Connecticut "Prof. Readey gives a grand tour of the kinetics of materials suitable for experimentalists and modellers.... In an easy-to-read and entertaining style, this book leads the reader to fundamental, model-based understanding of kinetic processes critical to development, fabrication and application of commercially-important soft (polymers, biomaterials), hard (ceramics, metals) and composite materials. It is a must-have for anyone who really wants to understand how to make materials and how they will behave in service." --Prof. Bill Lee, Imperial College London, Fellow of the Royal Academy of Engineering "A much needed text filling the gap between an introductory course in materials science and advanced materials-specific kinetics courses. Ideal for the undergraduate interested in an in-depth study of kinetics in materials." -Prof. Mark E. Eberhart, Colorado School of Mines This book provides an in-depth introduction to the most important kinetic concepts in materials science, engineering, and processing. All types of materials are addressed, including metals, ceramics, polymers, electronic materials, biomaterials, and composites. The expert author with decades of teaching and practical experience gives a lively and accessible overview, explaining the principles that determine how long it takes to change material properties and make new and better materials. The chapters cover a broad range of topics extending from the heat treatment of steels, the processing of silicon integrated microchips, and the production of cement, to the movement of drugs through the human body. The author explicitly avoids "black box" equations, providing derivations with clear explanations.

Screen Printing Technology for Energy Devices - Andreas Willfahrt 2019-03-05

The technical application of screen and stencil printing has been state of the art for decades. As part of the subtractive production process of printed circuit boards, for instance, screen and stencil printing play an important role. With the end of the 20th century, another field has opened up with organic electronics. Since then, more and more functional layers have been produced using printing methods. Printed electronics devices offer properties that give almost every freedom to the creativity of product development. Flexibility, low weight, use of non-toxic materials, simple disposal and an enormous number of units due to the production process are some of the prominent keywords associated with this field. Screen printing is a widely used process in printed electronics, as this process is very flexible with regard to the materials that can be used. In addition, a minimum resolution of approximately 30 μm is sufficiently high. The ink film thickness, which can be controlled over a wide range, is an extremely important advantage of the process. Depending on the viscosity, layer thicknesses of several hundred nanometres up to several hundred micrometres can be realised. The conversion and storage of energy became an increasingly important topic in recent years. Since regenerative energy sources, such as photovoltaics or wind energy, often supply energy intermittently, appropriate storage systems must be available. This applies to large installations for the power supply of society, but also in the context of autarkic sensors, such as those used in the Internet of Things or domestic/industrial automation. A combination of micro-energy converters and energy storage devices is an adequate concept for providing energy for such applications. In this thesis the above mentioned keywords are addressed and the feasibility of printed thermoelectric energy converters and supercapacitors as energy storage devices are investigated. The efficiency of thermoelectric generators (TEG) is low, but in industrial environments, for example, a large amount of unused low temperature heat energy can be found. If the production costs of TEGs are low,

conversion of this unused heat energy can contribute to increasing system efficiency. Additionally, printing of supercapacitor energy storage devices increases the usability of the TEG. It is appropriate to use both components as complementary parts in an energy system. Den tekniska tillämpningen av skärm- och stencilutskrift har varit toppmoderna i årtionden. Som en del av den subtraktiva produktionsprocessen av tryckta kretskort spelar exempelvis skärm- och stencilutskrift en viktig roll. I slutet av 1900-talet har ett annat fält öppnats med organisk elektronik. Sedan dess har allt fler funktionella lager producerats med hjälp av tryckmetoder. Tryckta elektronikanordningar erbjuder egenskaper som ger nästan all frihet till kreativiteten i produktutvecklingen. Flexibilitet, låg vikt, användning av giftfria material, enkelt bortskaffande och ett enormt antal enheter på grund av produktionsprocessen är några av de framträdande nyckelord som hör till detta område. Skärmtryck är en allmänt använd process i tryckt elektronik, eftersom processen är mycket flexibel med avseende på material som kan användas. Dessutom är en minsta upplösning på cirka 30 μm tillräckligt bra. Bläckfilmens tjocklek, som kan styras över ett brett område, är en extremt viktig fördel med processen. Beroende på viskositeten kan skiktjockleken på flera hundra nanometer upp till flera hundra mikrometer realiseras. Energikonvertering och lagring har blivit ett allt viktigare ämne de senaste åren. Eftersom regenerativa energikällor, såsom fotovoltaik eller vindkraft, ofta levererar energi intermitterant, måste lämpliga lagringssystem vara tillgängliga. Detta gäller stora installationer för samhällets strömförsörjning, men också inom ramen för autarkiska sensorer, som de som används i saker av saker eller inhemsk / industriell automation. En kombination av mikroenergiomvandlare och energilagringssystem är ett lämpligt koncept för att tillhandahålla energi för sådana applikationer. I denna avhandling behandlas ovan nämnda nyckelord. Genomförbarhet av tryckta termoelektriska energiomvandlare och superkapacitorer som energilagringssystem undersöks. Effektiviteten hos termoelektriska generatorer (TEG) är låg, men i industriella miljöer kan exempelvis en stor mängd oanvänd låg temperatur värmeenergi hittas. Om produktionskostnaderna för TEG är låga kan konvertering av denna oanvända värmeenergi bidra till ökad systemeffektivitet. Dessutom ökar utskrift av superkapacitorer användbarheten hos TEG. Det är lämpligt att använda båda komponenterna.

Chemistry with Inorganic Qualitative Analysis - Therald Moeller 1989-01-01

Materials Characterization - Yang Leng 2009-03-04

This book covers state-of-the-art techniques commonly used in modern materials characterization. Two important aspects of characterization, materials structures and chemical analysis, are included. Widely used techniques, such as metallography (light microscopy), X-ray diffraction, transmission and scanning electron microscopy, are described. In addition, the book introduces advanced techniques, including scanning probe microscopy. The second half of the book accordingly presents techniques such as X-ray energy dispersive spectroscopy (commonly equipped in the scanning electron microscope), fluorescence X-ray spectroscopy, and popular surface analysis techniques (XPS and SIMS). Finally, vibrational spectroscopy (FTIR and Raman) and thermal analysis are also covered.

Introduction to Solid State Physics - Charles Kittel 1971

Principles of Electronics - Colin David Simpson 1996

One of the most comprehensive, clearly written books on electronic technology, Simpson's invaluable guide offers a concise and practical overview of the basic principles, theorems, circuit behavior and problem-solving procedures of this intriguing and fast-paced science. Examines a broad spectrum of topics, such as atomic structure, Kirchhoff's laws, energy, power, introductory circuit analysis techniques, Thevenin's theorem, the maximum power transfer theorem, electric circuit analysis, magnetism, resonance semiconductor diodes, electron current flow, and much more. Smoothly integrates the flow of material in a nonmathematical format without sacrificing depth of coverage or accuracy to help readers grasp more complex concepts and gain a more thorough understanding of the principles of electronics. Includes many practical applications, problems and examples emphasizing troubleshooting, design, and safety to provide a solid foundation in the field of electronics. An ideal reference source for electronic engineering technicians and those involved in the electronic technology field.

Analog Integrated Circuit Design - Tony Chan Carusone 2012

The 2nd Edition of Analog Integrated Circuit Design focuses on more

coverage about several types of circuits that have increased in importance in the past decade. Furthermore, the text is enhanced with material on CMOS IC device modeling, updated processing layout and expanded coverage to reflect technical innovations. CMOS devices and circuits have more influence in this edition as well as a reduced amount of text on BiCMOS and bipolar information. New chapters include topics on frequency response of analog ICs and basic theory of feedback amplifiers.

Introduction to Computer Theory - Daniel I. A. Cohen 1997

This text strikes a good balance between rigor and an intuitive approach to computer theory. Covers all the topics needed by computer scientists with a sometimes humorous approach that reviewers found "refreshing". It is easy to read and the coverage of mathematics is fairly simple so readers do not have to worry about proving theorems.

Fundamentals of Electroceramics - R. K. Pandey 2019-01-07

The first textbook to provide in-depth treatment of electroceramics with emphasis on applications in microelectronics, magneto-electronics, spintronics, energy storage and harvesting, sensors and detectors, magnetics, and in electro-optics and acousto-optics Electroceramics is a class of ceramic materials used primarily for their electrical properties. This book covers the important topics relevant to this growing field and places great emphasis on devices and applications. It provides sufficient background in theory and mathematics so that readers can gain insight into phenomena that are unique to electroceramics. Each chapter has its own brief introduction with an explanation of how the said content impacts technology. Multiple examples are provided to reinforce the

content as well as numerous end-of-chapter problems for students to solve and learn. The book also includes suggestions for advanced study and key words relevant to each chapter. Fundamentals of Electroceramics: Materials, Devices and Applications offers eleven chapters covering: 1. Nature and types of solid materials; 2. Processing of Materials; 3. Methods for Materials Characterization; 4. Binding Forces in Solids and Essential Elements of Crystallography; 5. Dominant Forces and Effects in Electroceramics; 6. Coupled Nonlinear Effects in Electroceramics; 7. Elements of Semiconductor; 8. Electroceramic Semiconductor Devices; 9. Electroceramics and Green Energy; 10. Electroceramic Magnetism; and 11. Electro-optics and Acousto-optics. Provides an in-depth treatment of electroceramics with the emphasis on fundamental theoretical concepts, devices, and applications with focus on non-linear dielectrics Emphasizes applications in microelectronics, magneto-electronics, spintronics, energy storage and harvesting, sensors and detectors, magnetism and in electro-optics and acousto-optics Introductory textbook for students to learn and make an impact on technology Motivates students to get interested in research on various aspects of electroceramics at undergraduate and graduate levels leading to a challenging career path. Includes examples and problem questions within every chapter that prepare students well for independent thinking and learning. Fundamentals of Electroceramics: Materials, Devices and Applications is an invaluable academic textbook that will benefit all students, professors, researchers, scientists, engineers, and teachers of ceramic engineering, electrical engineering, applied physics, materials science, and engineering.