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## KEY=PRINCIPLES - KENYON HERRING

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### PRINCIPLES OF ELECTRONIC MATERIALS AND DEVICES

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"The third edition includes new topics and extended sections, such as diffusion, conduction in thin films, interconnects in microelectronics, electromigration, Stefan's radiation law, field emission from carbon nanotubes, piezoresistivity, amorphous semiconductors, solar cells, LEDs, Debye relaxation, giant magnetoresistance, magnetic data storage, Reststrahlen absorption, luminescence and white LEDs, and X-ray diffraction (Appendix). It also has a large number of new worked examples, numerous new homework problems, and many new illustrations and photographs. This text is one of the few books in the market that has the broad coverage of electronic materials and devices that today's scientists and engineers need."--Jacket.

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### PRINCIPLES OF ELECTRICAL ENGINEERING MATERIALS AND DEVICES

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

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### ELECTRONIC MATERIALS & DEV 3E SIE

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**Tata McGraw-Hill Education**

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### PRINCIPLES OF ELECTRICAL ENGINEERING MATERIALS AND DEVICES

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**McGraw-Hill Companies** This text offers comprehensive discussions of topics which are important to both electrical engineering and materials science students. The chapters are designed so that instructors can teach out of sequence or skip topics if desired.

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### STUDYGUIDE FOR PRINCIPLES OF ELECTRONIC MATERIALS AND DEVICES BY KASAP, ISBN 9780072393422

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**Cram101** Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780072393422 .

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### PRINCIPLES OF ELECTRICAL ENGINEERING MATERIALS AND DEVICES

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### A FIRST COURSE FOR ELECTRICAL ENGINEERS AND ENGINEERING PHYSICISTS

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### MOLECULAR ELECTRONICS

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### FROM PRINCIPLES TO PRACTICE

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**John Wiley & Sons** This consistent and comprehensive text is unique in providing an informed insight into molecular electronics by contrasting the prospects for molecular scale electronics with the continuing development of the inorganic semiconductor industry. Providing a wealth of information on the subject from background material to possible applications, Molecular Electronics contains all the need to know information in one easily accessible place. Speculation about future developments has also been included to give the whole picture of this increasingly popular and important topic.

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### INTRODUCTION TO THE ELECTRONIC PROPERTIES OF MATERIALS, 2ND EDITION

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**CRC Press** Electronic materials provide the basis for many high tech industries that have changed rapidly in recent years. In this fully revised and updated second edition, the author discusses the range of available materials and their technological applications. Introduction to the Electronic Properties of Materials, 2nd Edition presents the principles of the behavior of electrons in materials and develops a basic understanding with minimal technical detail. Broadly based, it touches on all of the key issues in the field and offers a multidisciplinary approach spanning physics, electrical engineering, and materials science. It provides an understanding of the behavior of electrons within materials, how electrons determine the magnetic thermal, optical and electrical properties of materials, and how electronic properties are controlled for use in technological applications. Although some mathematics is essential in this area, the mathematics that is used is easy to follow and kept to an appropriate level for the reader. An excellent introductory text for undergraduate students, this book is a broad introduction to the topic and provides a careful balance of information that will be appropriate for physicists, materials scientists, and electrical engineers.

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### SPRINGER HANDBOOK OF ELECTRONIC AND PHOTONIC MATERIALS

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**Springer** The second, updated edition of this essential reference book provides a wealth of detail on a wide range of electronic and photonic materials, starting from fundamentals and building up to advanced topics and applications. Its extensive coverage, with clear illustrations and applications, carefully selected chapter sequencing and logical flow, makes it very different from other electronic materials handbooks. It has been written by professionals in the field and instructors who teach the subject at a university or in corporate laboratories. The Springer Handbook of Electronic and Photonic Materials, second edition, includes practical applications used as examples, details of experimental techniques, useful tables that summarize equations, and, most importantly, properties of various materials, as well as an extensive glossary. Along with significant updates to the content and the references, the second edition includes a number of new chapters such as those covering novel materials and selected applications. This handbook is a valuable resource for graduate students, researchers and practicing professionals working in the area of electronic, optoelectronic and photonic materials.

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### OPTOELECTRONICS AND PHOTONICS

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### PRINCIPLES AND PRACTICES

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This book takes a fresh look at the last three decades and enormous developments in the new electro-optic devices and associated materials. General Treatment and various proofs are at a semiquantitative level without going into detailed physics. Contains numerous worked examples and solved problems. Chapter topics include wave nature of light, dielectric waveguides and optical fibers, semiconductor science and light emitting diodes, photodetectors, photovoltaic devices, and polarization and modulation of light. For the study of optoelectronics by electrical engineers.

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## THE ELECTRONICS HANDBOOK

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**CRC Press** During the ten years since the appearance of the groundbreaking, bestselling first edition of The Electronics Handbook, the field has grown and changed tremendously. With a focus on fundamental theory and practical applications, the first edition guided novice and veteran engineers along the cutting edge in the design, production, installation, operation, and maintenance of electronic devices and systems. Completely updated and expanded to reflect recent advances, this second edition continues the tradition. The Electronics Handbook, Second Edition provides a comprehensive reference to the key concepts, models, and equations necessary to analyze, design, and predict the behavior of complex electrical devices, circuits, instruments, and systems. With 23 sections that encompass the entire electronics field, from classical devices and circuits to emerging technologies and applications, The Electronics Handbook, Second Edition not only covers the engineering aspects, but also includes sections on reliability, safety, and engineering management. The book features an individual table of contents at the beginning of each chapter, which enables engineers from industry, government, and academia to navigate easily to the vital information they need. This is truly the most comprehensive, easy-to-use reference on electronics available.

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## OUTLINES AND HIGHLIGHTS FOR PRINCIPLES OF ELECTRONIC MATERIALS AND DEVICES BY SAFA O KASAP, ISBN

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9780073104645

**Academic Internet Pub Incorporated** Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780073104645 .

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## ELECTRONIC, MAGNETIC, AND OPTICAL MATERIALS

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**CRC Press** More than ever before, technological developments are blurring the boundaries shared by various areas of engineering (such as electrical, chemical, mechanical, and biomedical), materials science, physics, and chemistry. In response to this increased interdisciplinarity and interdependency of different engineering and science fields, Electronic, Magnetic, and Optical Materials takes a necessarily critical, all-encompassing approach to introducing the fundamentals of electronic, magnetic, and optical properties of materials to students of science and engineering. Weaving together science and engineering aspects, this book maintains a careful balance between fundamentals (i.e., underlying physics-related concepts) and technological aspects (e.g., manufacturing of devices, materials processing, etc.) to cover applications for a variety of fields, including: Nanoscience Electromagnetics Semiconductors Optoelectronics Fiber optics Microelectronic circuit design Photovoltaics Dielectric ceramics Ferroelectrics, piezoelectrics, and pyroelectrics Magnetic materials Building upon his twenty years of experience as a professor, Fulay integrates engineering concepts with technological aspects of materials used in the electronics, magnetics, and photonics industries. This introductory book concentrates on fundamental topics and discusses applications to numerous real-world technological examples—from computers to credit cards to optic fibers—that will appeal to readers at any level of understanding. Gain the knowledge to understand how electronic, optical, and magnetic materials and devices work and how novel devices can be made that can compete with or enhance silicon-based electronics. Where most books on the subject are geared toward specialists (e.g., those working in semiconductors), this long overdue text is a more wide-ranging overview that offers insight into the steadily fading distinction between devices and materials. It is well-suited to the needs of senior-level undergraduate and first-year graduate students or anyone working in industry, regardless of their background or level of experience.

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## PRINCIPLES OF ELECTRICAL ENGINEERING MATERIALS AND DEVICES

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This title is designed for a course on electrical engineering materials. The author has not added or removed sections to render this edition a second edition. However, a number of sections, illustrations, examples and problems have been revised and updated in the current revised edition. The revisions have improved the rigour without sacrificing the original semiquantitative approach. For example, the thermoelectric effect now includes the Mott-Jones index ( $x$ ) which is normally treated at the graduate level but has been introduced here through a semiquantitative discussion to explain the true sign of the Seebeck coefficient in metals (one of the most difficult graduate topics in quantum mechanics of metals). Overall, there are over some 300 individual changes to improve the textbook.

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## ELECTRONIC PROPERTIES OF MATERIALS

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**Springer Science & Business Media** This carefully revised third edition on the electrical, optical, magnetic, and thermal properties of materials stresses concepts rather than mathematical formalism. Many examples from engineering practice provide an understanding of common devices and methods.

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## ADVANCES IN IMAGING AND ELECTRON PHYSICS

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**Academic Press** Advances in Imaging and Electron Physics merges two long-running serials—Advances in Electronics and Electron Physics and Advances in Optical and Electron Microscopy. This series features extended articles on the physics of electron devices (especially semiconductor devices), particle optics at high and low energies, microlithography, image science and digital image processing, electromagnetic wave propagation, electron microscopy, and the computing methods used in all these domains

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## CAMBRIDGE ILLUSTRATED HANDBOOK OF OPTOELECTRONICS AND PHOTONICS

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**Cambridge University Press** From fundamental concepts to cutting-edge applications, this is the first encyclopaedic reference of important terms and effects in optoelectronics and photonics. It contains broad coverage of terms and concepts from materials to optical devices and communications systems. Self-contained descriptions of common tools and phenomena are provided for undergraduate and graduate students, scientists, engineers and technicians in industry and laboratories. The book strikes a balance between materials and devices related coverage and systems level terms, and captures key nomenclature used in the field. Equations are used where necessary, and lengthy derivations are avoided. Over 600 clear and self-explanatory illustrations are used to help convey key concepts, and enable readers to quickly grasp important concepts.

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## DIELECTRIC MATERIAL INTEGRATION FOR MICROELECTRONICS

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The Electrochemical Society

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## HIGH-K GATE DIELECTRICS FOR CMOS TECHNOLOGY

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**John Wiley & Sons** A state-of-the-art overview of high-k dielectric materials for advanced field-effect transistors, from both a fundamental and a technological viewpoint, summarizing the latest research results and development solutions. As such, the book clearly discusses the advantages of these materials over conventional materials and also addresses the issues that accompany their integration into existing production technologies. Aimed at academia and industry alike, this monograph combines introductory parts for newcomers to the field as well as advanced sections with directly applicable solutions for experienced researchers and developers in materials science, physics and electrical engineering.

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## NANOWIRES

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## IMPLEMENTATIONS AND APPLICATIONS

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**BoD - Books on Demand** This potentially unique work offers various approaches on the implementation of nanowires. As it is widely known, nanotechnology presents the control of matter at the nanoscale and nanodimensions within few nanometers, whereas this exclusive phenomenon enables us to determine novel applications. This book presents an overview of recent and current nanowire application and implementation research worldwide. We examine methods of nanowire synthesis, types of materials used, and applications associated with nanowire research. Wide surveys of global activities in nanowire research are presented, as well.

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**ADVANCES IN NANOCOMPOSITE MATERIALS FOR ENVIRONMENTAL AND ENERGY HARVESTING APPLICATIONS**

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**Springer Nature** This book discusses the fundamental, synthesis, properties, physico-chemical characterizations and applications of recently explored nanocomposite materials. It covers the applications of these different nanocomposite materials in the environmental and energy harvesting fields. The chapters explore the different techniques used for preparation and characterization of several types of nanocomposite materials for applications related to environmental and energy pathways. This book presents a panorama of current research in the field of nanocomposite structures for different applications. It also assesses the advantages and disadvantages of using different types of nanocomposite in the design of different material products. The comprehensive chapters explain the interactions between nanocomposite materials and mechanisms related to applications in environmental pollution and energy shortage.

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**MAGNETIC MATERIALS**

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**FUNDAMENTALS AND APPLICATIONS**

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**Cambridge University Press** 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

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**NANOSCALED SEMICONDUCTOR-ON-INSULATOR STRUCTURES AND DEVICES**

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**Springer Science & Business Media** This book offers combined views on silicon-on-insulator (SOI) nanoscaled electronics from experts in the fields of materials science, device physics, electrical characterization and computer simulation. Coverage analyzes prospects of SOI nanoelectronics beyond Moore's law and explains fundamental limits for CMOS, SOICMOS and single electron technologies.

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**MATERIALS SCIENCE FOR ENGINEERING STUDENTS**

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**Academic Press** Materials Science for Engineering Students offers students of introductory materials science and engineering, and their instructors, a fresh perspective on the rapidly evolving world of advanced engineering materials. This new, concise text takes a more contemporary approach to materials science than the more traditional books in this subject, with a special emphasis on using an inductive method to first introduce materials and their particular properties and then to explain the underlying physical and chemical phenomena responsible for those properties. The text pays particular attention to the newer classes of materials, such as ceramics, polymers and composites, and treats them as part of two essential classes – structural materials and functional materials – rather than the traditional method of emphasizing structural materials alone. This book is recommended for second and third year engineering students taking a required one- or two-semester sequence in introductory materials science and engineering as well as graduate-level students in materials, electrical, chemical and manufacturing engineering who need to take this as a core prerequisite. Presents balanced coverage of both structural and functional materials Types of materials are introduced first, followed by explanation of physical and chemical phenomena that drive their specific properties Strong focus on engineering applications of materials The first materials science text to include a whole chapter devoted to batteries Provides clear, mathematically simple explanations of basic chemistry and physics underlying materials properties

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**MATERIALS CHEMISTRY**

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**Springer Science & Business Media** The 2nd edition of Materials Chemistry builds on the strengths that were recognized by a 2008 Textbook Excellence Award from the Text and Academic Authors Association (TAA). Materials Chemistry addresses inorganic-, organic-, and nano-based materials from a structure vs. property treatment, providing a suitable breadth and depth coverage of the rapidly evolving materials field — in a concise format. The 2nd edition continues to offer innovative coverage and practical perspective throughout, e.g.: the opening solid-state chemistry chapter uses color illustrations of crystalline unit cells and digital photos of models to clarify their structures. This edition features more archetypical unit cells and includes fundamental principles of X-ray crystallography and band theory. In addition, an ample amorphous-solids section has been expanded to include more details regarding zeolite syntheses, as well as ceramics classifications and their biomaterial applications. The subsequent metals chapter has been re-organized for clarity, and continues to treat the full spectrum of powder metallurgical methods, complex phase behaviors of the Fe-C system and steels, and topics such as corrosion and shape-memory properties. The mining/processing of metals has also been expanded to include photographs of various processes occurring in an actual steelmaking plant. The semiconductor chapter addresses evolution and limitations/solutions of modern transistors, as well as IC fabrication and photovoltaics. Building on the fundamentals presented earlier, more details regarding the band structure of semiconductors is now included, as well as discussions of GaAs vs. Si for microelectronics applications, and surface reconstruction nomenclature. The emerging field of 'soft lithographic' patterning is now included in this chapter, and thin film deposition methodologies are also greatly expanded to now include more fundamental aspects of chemical vapor deposition (CVD) and atomic layer deposition (ALD). The polymer and 'soft' materials chapter represents the largest expansion for the 2nd edition. This chapter describes all polymeric classes including dendritic polymers, as well as important additives such as plasticizers and flame-retardants, and emerging applications such as molecular magnets and self-repairing polymers. This edition now features 'click chemistry' polymerization, silicones, conductive polymers and biomaterials applications such as biodegradable polymers, biomedical devices, drug delivery, and contact lenses. Final chapters on nanomaterials and materials-characterization techniques are also carefully surveyed, focusing on nomenclature, synthetic techniques, and applications taken from the latest scientific literature. The 2nd edition has been significantly updated to now include nanotoxicity, vapor-phase growth of 0-D nanostructures, and more details regarding synthetic techniques and mechanisms for solution-phase growth of various nanomaterials. Graphene, recognized by the 2010 Nobel Prize in Physics, is now also included in this edition. Most appropriate for Junior/Senior undergraduate students, as well as first-year graduate students in chemistry, physics, or engineering fields, Materials Chemistry may also serve as a valuable reference to industrial researchers. Each chapter concludes with a section that describes important materials applications, and an updated list of thought-provoking questions. The appendices have also been updated with additional laboratory modules for materials synthesis (e.g., porous silicon) and a comprehensive timeline of major materials developments.

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**MOLECULAR BEAM EPITAXY**

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**MATERIALS AND DEVICE APPLICATIONS**

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**Wiley** Covers both the fundamentals and the state-of-the-art technology used for MBE Written by expert researchers working on the frontlines of the field, this book covers fundamentals of Molecular Beam Epitaxy (MBE) technology and science, as well as state-of-the-art MBE technology for electronic and optoelectronic device applications. MBE applications to magnetic semiconductor materials are also included for future magnetic and spintronic device applications. Molecular Beam Epitaxy: Materials and Applications for Electronics and Optoelectronics is presented in five parts: Fundamentals of MBE; MBE technology for electronic devices application; MBE for optoelectronic devices; Magnetic semiconductors and spintronics devices; and Challenge of MBE to new materials and new researches. The book offers chapters covering the history of MBE; principles of MBE and fundamental mechanism of MBE growth; migration enhanced epitaxy and its application; quantum dot formation and selective area growth by MBE; MBE of III-nitride semiconductors for electronic devices; MBE for Tunnel-FETs; applications of III-V semiconductor quantum dots in optoelectronic devices; MBE of III-V and III-nitride heterostructures for optoelectronic devices with emission wavelengths from THz to ultraviolet; MBE of III-V semiconductors for mid-infrared photodetectors and solar cells; dilute magnetic semiconductor materials and ferromagnet/semiconductor heterostructures and their application to spintronic devices; applications of bismuth-containing III-V semiconductors in devices; MBE growth and device applications of Ga<sub>2</sub>O<sub>3</sub>; Heterovalent semiconductor structures and their device applications; and more. Includes chapters on the fundamentals of MBE Covers new challenging researches in MBE and new technologies Edited by two pioneers in the field of MBE with contributions from well-known MBE authors including three AI Cho MBE Award winners Part of the Materials for Electronic and Optoelectronic Applications series Molecular Beam Epitaxy: Materials and Applications for Electronics and Optoelectronics will appeal to graduate students, researchers in academia and industry, and others interested in the area of epitaxial growth.

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**ELECTROCERAMICS**

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**MATERIALS, PROPERTIES, APPLICATIONS**

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**John Wiley & Sons** Electroceramics, Materials, Properties, Applications, Second Edition provides a comprehensive treatment of the many aspects of ceramics and their electrical applications. The fundamentals of how electroceramics function are carefully introduced with their properties and

applications also considered. Starting from elementary principles, the physical, chemical and mathematical background of the subject are discussed and wherever appropriate, a strong emphasis is placed on the relationship between microstructure and properties. The Second Edition has been fully revised and updated, building on the foundation of the earlier book to provide a concise text for all those working in the growing field of electroceramics. fully revised and updated to include the latest technological changes and developments in the field includes end of chapter problems and an extensive bibliography an Invaluable text for all Materials Science students. a useful reference for physicists, chemists and engineers involved in the area of electroceramics.

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### OPTICAL PROPERTIES OF CONDENSED MATTER AND APPLICATIONS

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**John Wiley & Sons** Following a semi-quantitative approach, this book presents a summary of the basic concepts, with examples and applications, and reviews recent developments in the study of optical properties of condensed matter systems. Key Features: Covers basic knowledge as well as application topics Includes theory, experimental techniques and current and developing applications Timely and useful contribution to the literature Written by internationally respected contributors working in physics and electrical engineering departments and government laboratories

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### THE BRITISH NATIONAL BIBLIOGRAPHY

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### PRACTICAL INJECTION MOLDING

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**CRC Press** This work focuses on the factors critical to successful injection moulding, including knowledge of plastic materials and how they melt, the importance of mould design, the role of the screw, and the correct use of the controls of an injection moulding machine. It seeks to provide operating personnel with a clear understanding of the basics of injection moulding, resulting in more efficient processing, reduced cycle times, and better part quality with fewer rejects.

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### DESIGN AND ANALYSIS OF MATERIALS AND ENGINEERING STRUCTURES

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**Springer Science & Business Media** The idea of this monograph is to present the latest results related to design and analysis of materials and engineering structures. The contributions cover the field of mechanical and civil engineering, ranging from automotive to dam design, transmission towers and up to machine design and examples taken from oil industry. Well known experts present their research on damage and fracture of material and structures, materials modelling and evaluation up to image processing and visualization for advanced analyses and evaluation

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### SCANNING PROBE MICROSCOPY IN NANOSCIENCE AND NANOTECHNOLOGY 3

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**Springer Science & Business Media** This book presents the physical and technical foundation of the state of the art in applied scanning probe techniques. It constitutes a timely and comprehensive overview of SPM applications. The chapters in this volume relate to scanning probe microscopy techniques, characterization of various materials and structures and typical industrial applications, including topographic and dynamical surface studies of thin-film semiconductors, polymers, paper, ceramics, and magnetic and biological materials. The chapters are written by leading researchers and application scientists from all over the world and from various industries to provide a broader perspective.

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### HIGH-FREQUENCY BIPOLAR TRANSISTORS

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**Springer Science & Business Media** This modern book-length treatment gives a detailed presentation of high-frequency bipolar transistors in silicon or silicon-germanium technology, with particular emphasis placed on today's advanced compact models and their physical foundations.

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### OVERVOLTAGE PROTECTION OF LOW-VOLTAGE SYSTEMS, REVISED EDITION

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**IET** This highly illustrated and practical book surveys techniques available to protect LV equipment and systems from lightning strikes and other surges. After examining the physical origins and effects of these phenomena, it concentrates on the components and applications of protective measures and systems, placed in the context of current IEC and VDE standards. This unique book provides the reader with a thorough background in almost every aspect of lightning and its impact on electrical and electronic equipment. The contents range from basic discharge processes in air through transient electromagnetic field generation and interaction with overhead lines and underground cables, to lightning protection and testing techniques. This book is of value to anyone designing, installing or commissioning equipment, which needs to be secured against lightning strikes, as well as being a sound introduction to research students working in the field.

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### DIGITAL ELECTRONIC CIRCUITS - THE COMPREHENSIVE VIEW

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**World Scientific** This book deals with key aspects of design of digital electronic circuits for different families of elementary electronic devices. Implementation of both simple and complex logic circuits are considered in detail, with special attention paid to the design of digital systems based on complementary metal-oxide-semiconductor (CMOS) and Pass-Transistor Logic (PTL) technologies acceptable for use in planar microelectronics technology. It is written for students in electronics and microelectronics, with exercises and solutions provided.

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### FUNCTIONALIZED NANOSCALE MATERIALS, DEVICES AND SYSTEMS

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**Springer Science & Business Media** The primary objective of the NATO Advanced Study Institute (ASI) titled "Functionalized Nanoscale Materials, Devices, and Systems for Chem. -Bio Sensors, Photonics, and Energy Generation and Storage" was to present a contemporary and comprehensive overview of the field of nanostructured materials and devices and its applications in chem. -bio sensors, nanophotonics, and energy generation and storage devices. The study has become one of the most promising disciplines in science and technology, as it aims at the fundamental understanding of new physical, chemical, and biological properties of systems and the technological advances arising from their exploration. Such systems are intermediate in size, between the isolated atoms and molecules and bulk material, where the unique transitional characteristics between the two can be understood, controlled, and manipulated. Nanotechnologies refer to the creation and utilization of functional materials, devices, and systems with novel properties and functions that are achieved through the control of matter, atom-by-atom, molecule-by-molecule, or at a micro-molecular level. Advances made over the last few years provide new opportunities for scientific and technological developments in nanostructures and nanosystems with new architectures with improved functionality. The field is very actively and rapidly evolving and covers a wide range of disciplines. Recently, various nanoscale materials, devices, and systems with remarkable properties have been developed, with numerous unique applications in chemical and biological sensors, nanophotonics, nano-biotechnology, and in-vivo analysis of cellular processes at the nanoscale.

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### NANOROBOTICS

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### CURRENT APPROACHES AND TECHNIQUES

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**Springer Science & Business Media** Nanorobots can be defined as intelligent systems with overall dimensions at or below the micrometer range that are made of assemblies of nanoscale components with individual dimensions ranging between 1 to 100 nm. These devices can now perform a wide variety of tasks at the nanoscale in a wide variety of fields including but not limited to fields such as manufacturing, medicine, supply chain, biology, and aerospace. Nanorobotics: Current Approaches and Techniques offers a comprehensive overview of this emerging interdisciplinary field with a wide ranging discussion that includes nano-manipulation and industrial nanorobotics, nanorobotic manipulation in biology and medicine, nanorobotic sensing, navigation and swarm behavior and CNT, and protein and DNA-based nanorobotics.

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### MICROWAVES AND METALS

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**John Wiley & Sons** Using microwaves to treat metal-based materials is rapidly emerging as an energy-efficient tool to interact with metals for a number of processes such as sintering, melting, brazing, carburizing and annealing. Microwaves can sinter a wide variety of metal compacts with comparable or enhanced end properties, while at the same time delivering tremendous energy savings over conventional sintering. Microwave processes are therefore gaining increasing attention and adoption in both academia and industry. Gupta and Wong have written this comprehensive text to introduce readers to the world of microwaves and the interaction of microwaves with metals and metals-based formulations. The authors have combined numerous research results from a wide range of sources alongside their own work in the field. Also included are overviews of microwave heating of other non-metal materials and the equipment used for microwave-assisted metallurgy. With microwave techniques poised for widespread adoption, Microwaves and Metals is an essential text for all metallurgists and materials engineers. Provides a thorough grounding in microwave fundamentals and their application to metals processing Informs readers of the latest developments in the field Presents a convenient single source for all aspects of microwave processing of metals and materials Contains liberal illustration to compare and benchmark research results Introduces all the necessary equipment.

preparing readers for real-world practice. *Microwaves and Metals* is ideal for a post-graduate or advanced undergraduate course in materials science or metallurgy. Materials and metallurgical engineers in industry, who are keen on cheaper, faster techniques, will also benefit from this book.

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**SCIENCE AND ENGINEERING OF MATERIALS, SI EDITION**

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**Cengage Learning** Succeed in your materials science course with *THE SCIENCE AND ENGINEERING OF MATERIALS, 7e*. Filled with built-in study tools to help you master key concepts, this proven book will help you develop an understanding of the relationship between structure, processing, and properties of materials and will serve as a useful reference for future courses in manufacturing, materials, design, or materials selection. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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**THERMOELECTRICAL EFFECT IN SiC FOR HIGH-TEMPERATURE MEMS SENSORS**

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**Springer** This book presents the fundamentals of the thermoelectrical effect in silicon carbide (SiC), including the thermoresistive, thermoelectric, thermocapacitive and thermoelectronic effects. It summarizes the growth of SiC, its properties and fabrication processes for SiC devices and introduces the thermoelectrical sensing theories in different SiC morphologies and polytypes. Further, it reviews the recent advances in the characterization of the thermoelectrical effect in SiC at high temperatures. Discussing several desirable features of thermoelectrical SiC sensors and recent developments in these sensors, the book provides useful guidance on developing high sensitivity and linearity, fast-response SiC sensing devices based on thermoelectrical effects.