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KEY=MATERIALS - RIVERA LEBLANC

Principles of Electronic Materials and Devices "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. **Electronic Materials & Dev 3E** Sie [Tata McGraw-Hill Education](#) **Principles of Electrical Engineering Materials and Devices** [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 **Electronic Materials Principles and Applied Science** [Elsevier](#) Mechanical and thermal properties are reviewed and electrical and magnetic properties are emphasized. Basics of symmetry and internal structure of crystals and the main properties of metals, dielectrics, semiconductors, and magnetic materials are discussed. The theory and modern experimental data are presented, as well as the specifications of materials that are necessary for practical application in electronics. The modern state of research in nanophysics of metals, magnetic materials, dielectrics and semiconductors is taken into account, with particular attention to the influence of structure on the physical properties of nano-materials. The book uses simplified mathematical treatment of theories, while emphasis is placed on the basic concepts of physical phenomena in electronic materials. Most chapters are devoted to the advanced scientific and technological problems of electronic materials; in addition, some new insights into theoretical facts relevant to technical devices are presented. **Electronic Materials** is an essential reference for newcomers to the field of electronics, providing a fundamental understanding of important basic and advanced concepts in electronic materials science. Provides important overview of the fundamentals of electronic materials properties significant for device applications along with advanced and applied concepts essential to those working in the field of electronics Takes a simplified and mathematical approach to theories essential to the understanding of electronic materials and summarizes important takeaways at the end of each chapter Interweaves modern experimental data and research in topics such as nanophysics, nanomaterials and dielectrics **Principles of Electrical Engineering Materials and Devices** [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. **Physics of Electronic Materials Principles and Applications** [Cambridge University Press](#) Adopting a uniquely pedagogical approach, this comprehensive textbook on the quantum mechanics of semiconductor materials and devices focuses on the materials, components and devices themselves whilst incorporating a substantial amount of fundamental physics related to condensed matter theory and quantum mechanics. Written primarily for advanced undergraduate students in physics and engineering, this book can also be used as a supporting text for introductory quantum mechanics courses, and will be of interest to anyone interested in how electronic devices function at a fundamental level. Complete with numerous exercises, and with all the necessary mathematics and physics included in appendices, this book guides the reader seamlessly through the principles of quantum mechanics and the quantum theory of metals and semiconductors, before describing in detail how devices are exploited within electric circuits and in the hardware of computers, for example as amplifiers, switches and transistors. **Molecular Nonlinear Optics Materials, Physics, and Devices** [Academic Press](#) This volume brings together contributions from world renowned researchers on molecular nonlinear optics. It takes as its impetus work done over the last five years in which newly developed optoelectronic devices have deepened our understanding of the fundamental physics and chemistry underlying these materials. Organic materials involving thin films, polymers, and resulting devices will be emphasized. **Ambipolar Materials and Devices** [Royal Society of Chemistry](#) Ambipolar materials represent a class of materials where positive and negative charge carriers can both transport concurrently. In recent years, a diverse range of materials have been synthesized and utilized for implementing ambipolar charge transport, with applications in high-density data storage, field effect transistors, nanotransistors, photonic memory, biomaterial-based memories and artificial synapses. This book highlights recent development of ambipolar materials involving materials design, fundamental principles, interface modifications, device structures, ambipolar characteristics and promising applications. Challenges and prospects for investigating ambipolar materials in electronics and optoelectronics are also discussed. With contributions from global leaders in the field, this title will appeal to graduate students and researchers who want to understand the design, materials characteristics, device operation principles, specialized device application and mechanisms of the latest ambipolar materials. **Outlines and Highlights for Principles of Electronic Materials and Devices** by Safa O Kasap, [ISBN 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 . **Principles of Semiconductor Devices** [Oxford University Press, USA](#) "This dynamic text applies physics concepts and equations to practical, real-world applications of semiconductor device theory"-- **Nanoelectronics and Information Technology Advanced Electronic Materials and Novel Devices** [John Wiley & Sons](#) This outstanding textbook provides an introduction to electronic materials and device concepts for the major areas of current and future information technology. On about 1,000 pages, it collects the fundamental concepts and key technologies related to advanced electronic materials and devices. The obvious strength of the book is its encyclopedic character, providing adequate background material instead of just reviewing current trends. It focuses on the underlying principles which are illustrated by contemporary examples. The third edition now holds 47 chapters grouped into eight sections. The first two sections are devoted to principles, materials processing and characterization methods. Following sections hold contributions to relevant materials and various devices, computational concepts, storage systems, data transmission, imaging systems and displays. Each subject area is opened by a tutorial introduction, written by the editor and giving a rich list of references. The following chapters provide a concise yet in-depth description in a given topic. Primarily aimed at graduate students of physics, electrical engineering and information technology as well as material science, this book is equally of interest to professionals looking for a broader overview. Experts might appreciate the book for having quick access to principles as well as a source for getting insight into related fields. **Semiconductor Materials An Introduction to Basic Principles** [Springer Science & Business Media](#) The technological progress is closely related to the developments of various materials and tools made of those materials. Even the different ages have been defined in relation to the materials used. Some of the major attributes of the present-day age (i.e., the electronic materials' age) are such common tools as computers and fiber-optic telecommunication systems, in which semiconductor materials provide vital components for various mic- electronic and optoelectronic devices in applications such as computing, memory storage, and communication. The field of semiconductors encompasses a variety of disciplines. This book is not intended to provide a comprehensive description of a wide range of semiconductor properties or of a continually increasing number of the semiconductor device applications. Rather, the main purpose of this book is to provide an introductory perspective on the basic principles of semiconductor materials and their applications that are described in a relatively concise format in a single volume. Thus, this book should especially be suitable as an introductory text for a single course on semiconductor materials that may be taken by both undergraduate and graduate engineering students. This book should also be useful, as a concise reference on semiconductor materials, for researchers working in a wide variety of fields in physical and engineering sciences. **Handbook of Organic Materials for Optical and (Opto)Electronic Devices Properties and Applications** [Elsevier](#) Small molecules and conjugated polymers, the two main types of organic materials used for optoelectronic and photonic devices, can be used in a number of applications including organic light-emitting diodes, photovoltaic devices, photorefractive devices and waveguides. Organic materials are attractive due to their low cost, the possibility of their deposition from solution onto large-area substrates, and the ability to tailor their properties. The Handbook of organic materials for optical and (opto)electronic devices provides an overview of the properties of organic optoelectronic and nonlinear optical materials, and explains how these materials can be used across a range of applications. Parts one and two explore the materials used for organic optoelectronics and nonlinear optics, their properties, and methods of their characterization illustrated by physical studies. Part three moves on to discuss the applications of optoelectronic and nonlinear optical organic materials in devices and includes chapters on organic solar cells, electronic memory devices, and electronic chemical sensors, electro-optic devices. The Handbook of organic materials for optical and (opto)electronic devices is a technical resource for physicists, chemists, electrical engineers and materials scientists involved in research and development of organic semiconductor and nonlinear optical materials and devices. **Comprehensively examines the properties of organic optoelectronic and nonlinear optical materials** Discusses their applications in different devices including solar cells, LEDs and electronic memory devices **An essential technical resource for physicists, chemists, electrical engineers and materials scientists** **The Physics of Degradation in Engineered Materials and Devices** **Fundamentals and Principles** Degradation is apparent in all things and is fundamental to manufactured as well as natural objects. It is often described by the second law of thermodynamics where entropy, a measure of disorder, tends to increase with time in a closed system. Things age! This concise reference work brings together experts and key players engaged in the physics of degradation to present the background science, current thinking and developments in understanding, and give a detailed account of emerging issues across a selection of engineering applications. The work has been put together to equip the upper level undergraduate student, postgraduate student as well as the professional engineer and scientist in the importance of physics of degradation. The aim of the work is to bridge the gap between published textbooks on the fundamental science of degradation phenomena and published research on the engineering science of actual fabricated materials and devices. A history of the observation and understanding of physics of degradation is presented. The fundamentals and principles of thermodynamics and entropy are extensively discussed. This is the focus of this work with an extended chapter by Alec Feinberg on equilibrium thermodynamic damage and non-equilibrium thermodynamic damage. The work concludes with two particular technologies to give examples of areas of application. **Organic Electronics Materials and Devices** [Springer](#) This book is an introductory text for graduate students, researchers in industries, and those who are just beginning to work on organic electronics materials, devices and their applications. The book includes mainly fundamental principles and theories for understanding organic electronics materials and devices, but also provides information about state-of-the-art technologies, applications and future prospects. These topics encompass physics for organic transistors, structure control technologies of polymer semiconductors, nanomaterials electronics, organic solar cells, organic electroluminescence, liquid semiconductors and dynamics for excitation, among others. This book will help researchers to be able to contribute to society with the technologies and science of organic electronics materials in the future. **Principles of Solar Cells, LEDs and Related Devices** **The Role of the PN Junction** [John Wiley & Sons](#) The second edition of the text that offers an introduction to the principles of solar cells and LEDs, revised and updated The revised and updated second edition of **Principles of Solar Cells, LEDs and Related Devices** offers an introduction to the physical concepts required for a comprehensive understanding of p-n junction devices, light emitting diodes and solar cells. The author - a noted expert in the field - presents information on the semiconductor and junction device fundamentals and extends it to the practical

implementation of semiconductors in both photovoltaic and LED devices. In addition, the text offers information on the treatment of a range of important semiconductor materials and device structures including OLED devices and organic solar cells. This second edition contains a new chapter on the quantum mechanical description of the electron that will make the book accessible to students in any engineering discipline. The text also includes a new chapter on bipolar junction and junction field effect transistors as well as expanded chapters on solar cells and LEDs that include more detailed information on high efficiency devices. This important text: Offers an introduction to solar cells and LEDs, the two most important applications of semiconductor diodes Provides a solid theoretical basis for p-n junction devices Contains updated information and new chapters including better coverage of LED out-coupling design and performance and improvements in OLED efficiency Presents student problems at the end of each chapter and worked example problems throughout the text Written for students in electrical engineering, physics and materials science and researchers in the electronics industry, Principles of Solar Cells, LEDs and Related Devices is the updated second edition that offers a guide to the physical concepts of p-n junction devices, light emitting diodes and solar cells. Springer Handbook of Electronic and Photonic Materials [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. Perovskite Solar Cells: Principle, Materials And Devices [World Scientific](#) Energy and climate change are two of the most critical issues nowadays. These two topics are also correlated to each other. Fossil fuels are the main energy supplies that have been used in modern history since the industrial revolution. The impact of CO₂ emission has been a major concern for its effect on global warming and other consequences. In addition, fossil fuels are not unlimited. Due to the increasing demands for energy supplies, alternative renewable, sustainable, environmentally friendly energy resources are desirable. Solar energy is an unlimited, clean, and renewable energy source, which can be considered to replace the energy supply of fossil fuel. The silicon solar cell is one of the dominant photovoltaic technologies currently, which converting sunlight directly into electric power with around 20% efficiency. This technique was been widely used in mainstream solar energy applications for decades, though the relatively energy-demanding production process remained with challenges to be resolved. Recently, emerging photovoltaic technologies such as organometal halide hybrid perovskite solar cell has attracted tremendous attention due to their promising power conversion efficiencies (over 22%) and ease of fabrication. Their progress roadmap is unprecedented in photovoltaic history from the material development and efficiency advancement perspective. Beyond the rapid progress achieved in the last few years, it is expected that this novel technology would make an impact on the future solar cell market providing long-term stability and Pb content issues are addressed. These challenges rely on a better understanding of materials and device function principles. The scope of this book is to provide a collection on the recent investigations from fundamental process, materials development to device optimization for perovskite solar cells. Contents: Additive-Assisted Controllable Growth of Perovskites (Yixin Zhao and Kai Zhu) Control of Film Morphology for High Performance Perovskite Solar Cells (Cheng-Min Tsai, Hau-Shiang Shiu, Hui-Ping Wu and Eric Wei-Guang Diao) Sensitization and Functions of Porous Titanium Dioxide Electrodes in Dye-Sensitized Solar Cells and Organolead Halide Perovskite Solar Cells (Seigo Ito) P-Type and Inorganic Hole Transporting Materials for Perovskite Solar Cells (Ming-Hsien Li, Yu-Hsien Chiang, Po-Shen Shen, Sean Sung-Yen Juang and Peter Chao-Yu Chen) Hole Conductor Free Organometal Halide Perovskite Solar Cells: Properties and Different Architectures (Sigalit Aharon and Lioz Etgar) Stability Issues of Inorganic/Organic Hybrid Lead Perovskite Solar Cells (Dan Li and Mingkui Wang) Time-Resolved Photoconductivity Measurements on Organometal Halide Perovskites (Eline M Hutter, Tom J Savenije and Carlito S Ponseca Jr) Readership: Graduate students and researchers in chemistry, materials science and photovoltaics. Keywords: Perovskite Solar Cells; Hole Transporting Materials; Stability; THz Spectroscopy Review: 0 Electronic Devices and Circuits Principles, Designs and Applications In recent years Electronic Devices & Circuits: Principles, Designs & Applications are being used extensively in computers, microprocessor and very large scale integration (VLSI) design and digital signal processing research and many other things. This rapid progress in Electronics Engineering has created an increasing demand for trained Electronics Engineering personnel. This book is intended for the undergraduate and postgraduate students specializing in Electronics Engineering. It will also serve as reference material for engineers employed in industry. The fundamental concepts and principles behind electronics engineering are explained in a simple, easy-to-understand manner. Each chapter contains a large number of solved example or problem which will help the students in problem solving and designing of Electronics system. This text book is organized into thirteen chapters. Chapter 0: Famous Scientists and Inventors who Shaped Electronics Engineering Chapter 1: Introduction to Electronics, Current and Voltage Sources and Semiconductor Physics Chapter 2: Semiconductor Diode and its Applications Chapter 3: Bipolar Junction Transistor (BJT), Transistor Biasing and Stabilization of Operating Point Chapter 4: Applications of BJTs Chapter 5: Junction Field Effect Transistor & Metal Oxide Semiconductor Field Effect Transistor Chapter 6: SINUSOIDAL OSCILLATORS, SCR, UJT, Solar Panel, Tunnel Diode, Photo Diode, Schottky Diode, LCD & LED We do hope that the text book in the present form will meet the requirement of the students doing graduation in Electronics & Communication Engineering, Computer Science Engineering, Information Technology, Electronics & Instrumentation Engineering and Electrical & Electronics Engineering. We will appreciate any suggestions from students and faculty members alike so that we can strive to make the text book more useful in the edition to come. The book Electronic Devices & Circuits: Principles, Designs & Applications is written to cater to the needs of the undergraduate courses in the discipline of Electronics & Communication Engineering, Computer Science Engineering, Information Technology, Electronics & Instrumentation Engineering, Electrical & Electronics Engineering and postgraduate students specializing in Electronics. It will also serve as reference material for engineers employed in industry. The fundamental concepts and principles behind Sinusoidal Oscillators, SCR, UJT, Solar Panel, Tunnel Diode, Photo Diode, Schottky Diode, LCD & LED designs are explained in a simple, easy-to-understand manner. Each Chapter of book gives the design of Electronics Devices that can be done by students of B.E./B.Tech/ M/Tech. level. Salient Features: *Detailed coverage of Introduction to Electronics, Current and Voltage Sources and Semiconductor Physics, Semiconductor Diode and its Applications. *Comprehensive Coverage of Bipolar Junction Transistor (BJT), Transistor Biasing and Stabilization of Operating Point and Applications of BJTs. *Detailed coverage of Junction Field Effect Transistor & Metal Oxide Semiconductor Field Effect Transistor. *Detailed coverage of Sinusoidal Oscillators, SCR, UJT, Solar Panel, Tunnel Diode, Photo Diode, Schottky Diode, LCD & LED. *Each chapter contains a large number of solved example or objective type's problem which will help the students in problem solving and designing of Electronic Devices and circuits. *Clear perception of the various problems with a large number of neat, well drawn and illustrative diagrams. *Simple Language, easy-to-understand manner. Principles of Extreme Mechanics (XM) in Design for Reliability (DfR) With Special Emphasis on Recent Advances in Materials Characterization and Experimentation Techniques [Springer Nature](#) Introduction to Electronic Materials and Devices [Springer](#) This textbook lays out the fundamentals of electronic materials and devices on a level that is accessible to undergraduate engineering students with no prior coursework in electromagnetism and modern physics. The initial chapters present the basic concepts of waves and quantum mechanics, emphasizing the underlying physical concepts behind the properties of materials and the basic principles of device operation. Subsequent chapters focus on the fundamentals of electrons in materials, covering basic physical properties and conduction mechanisms in semiconductors and their use in diodes, transistors, and integrated circuits. The book also deals with a broader range of modern topics, including magnetic, spintronic, and superconducting materials and devices, optoelectronic and photonic devices, as well as the light emitting diode, solar cells, and various types of lasers. The last chapter presents a variety of materials with specific novel applications, such as dielectric materials used in electronics and photonics, liquid crystals, and organic conductors used in video displays, and superconducting devices for quantum computing. Clearly written with compelling illustrations and chapter-end problems, Rezende's Introduction to Electronic Materials and Devices is the ideal accompaniment to any undergraduate program in electrical and computer engineering. Adjacent students specializing in physics or materials science will also benefit from the timely and extensive discussion of the advanced devices, materials, and applications that round out this engaging and approachable textbook. 1ST-PRINCIPLES SIMULATION OF M [Open Dissertation Press](#) This dissertation, "First-principles Simulation of Multi-terminal Carbon-nanotube Based Electronic Devices" by Siu-kong, Koo, [] [], was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. DOI: 10.5353/th_b4425166 Subjects: Nanotubes Carbon Electronic apparatus and appliances - Materials Principles of Vapor Deposition of Thin Films [Elsevier](#) The goal of producing devices that are smaller, faster, more functional, reproducible, reliable and economical has given thin film processing a unique role in technology. Principles of Vapor Deposition of Thin Films brings in to one place a diverse amount of scientific background that is considered essential to become knowledgeable in thin film deposition techniques. Its ultimate goal as a reference is to provide the foundation upon which thin film science and technological innovation are possible. * Offers detailed derivation of important formulae. * Thoroughly covers the basic principles of materials science that are important to any thin film preparation. * Careful attention to terminologies, concepts and definitions, as well as abundance of illustrations offer clear support for the text. Electronic Materials Inside Electronic Devices The MATERIALS IN ACTION series has been produced by the Materials Engineering Department of the Open University's Technology Faculty as an undergraduate-level text. Its publication in book format brings the Open University's highly regarded texts and teaching methods to a wider audience. The series comprises four books: Materials Principles and Practice Manufacturing with Materials Structural Materials Electronic Materials Each book is self-contained and is based on an industrial context. Electronic Materials is about materials that are used for their electrical and magnetic properties, rather than their mechanical properties. Exploiting electronic properties in many products calls for careful manipulation of materials' structures at the atomic and microstructural levels. The book explains the scientific models needed to guide those manipulations and describes how they are commercially exploited inside electronic devices. Printed, hybrid and integrated circuit technologies are discussed together with ways of providing circuit components at each scale. Electronic and magnetic transducers, magnetic components (such as transformer cores and memory systems), optoelectronics, visual-display technologies and semiconductor memory systems are examined. A study of the interplay among the development, manufacture and marketing of innovative high-temperature superconductors puts these topics into an entrepreneurial context. Thermoelectrics Basic Principles and New Materials Developments [Springer Science & Business Media](#) An in-depth analysis of thermoelectric theory, an overview of present day thermoelectric materials and devices, and updated information on the most studied thermoelectric materials development. The main emphasis is on a basic understanding of the concepts as well as experimental techniques needed to propel researchers towards new and novel classes of thermoelectric materials with enhanced properties. Digital Electronics Principles, Devices and Applications [John Wiley & Sons](#) The fundamentals and implementation of digital electronics are essential to understanding the design and working of consumer/industrial electronics, communications, embedded systems, computers, security and military equipment. Devices used in applications such as these are constantly decreasing in size and employing more complex technology. It is therefore essential for engineers and students to understand the fundamentals, implementation and application principles of digital electronics, devices and integrated circuits. This is so that they can use the most appropriate and effective technique to suit their technical need. This book provides practical and comprehensive coverage of digital electronics, bringing together information on fundamental theory, operational aspects and potential applications. With worked problems, examples, and review questions for each chapter, Digital Electronics includes: information on number systems, binary codes, digital arithmetic, logic gates and families, and Boolean algebra; an in-depth look at multiplexers, de-multiplexers, devices for arithmetic operations, flip-flops and related devices, counters and registers, and data conversion circuits; up-to-date coverage of recent application fields, such as programmable logic devices, microprocessors, microcontrollers, digital troubleshooting and digital instrumentation. A comprehensive, must-read book on digital electronics for senior

undergraduate and graduate students of electrical, electronics and computer engineering, and a valuable reference book for professionals and researchers. Semiconductor Lithography Principles, Practices, and Materials [Springer Science & Business Media](#) Semiconductor lithography is one of the key steps in the manufacturing of integrated silicon-based circuits. In fabricating a semiconductor device such as a transistor, a series of hot processes consisting of vacuum film deposition, oxidations, and dopant implantation are all patterned into microscopic circuits by the wet processes of lithography. Lithography, as adopted by the semiconductor industry, is the process of drawing or printing the pattern of an integrated circuit in a resist material. The pattern is formed and overlaid to a previous circuit layer as many as 30 times in the manufacture of logic and memory devices. With the resist pattern acting as a mask, a permanent device structure is formed by subtractive (removal) etching or by additive deposition of metals or insulators. Each process step in lithography uses inorganic or organic materials to physically transform semiconductors of silicon, insulators of oxides, nitrides, and organic polymers, and metals, into useful electronic devices. All forms of electromagnetic radiation are used in the processing. Lithography is a multidisciplinary science of materials, processes, and equipment, interacting to produce three-dimensional structures. Many aspects of chemistry, electrical engineering, materials science, and physics are involved. The purpose of this book is to bring together the work of many scientists and engineers over the last 10 years and focus upon the basic resist materials, the lithographic processes, and the fundamental principles behind each lithographic process. [Molecular Electronics From Principles to Practice 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. [First Principles Approaches to Spectroscopic Properties of Complex Materials Springer](#) The series [Topics in Current Chemistry](#) presents critical reviews of the present and future trends in modern chemical research. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to give the non-specialist reader, whether in academia or industry, a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented using selected examples to illustrate the principles discussed. The coverage is not intended to be an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field. Review articles for the individual volumes are invited by the volume editors. Readership: research chemists at universities or in industry, graduate students. [Principles and Applications of Ferroelectrics and Related Materials Oxford University Press](#) This is a standard work on ferroelectrics. [Physical Principles of Electron Microscopy An Introduction to TEM, SEM, and AEM Springer Science & Business Media](#) Scanning and stationary-beam electron microscopes are indispensable tools for both research and routine evaluation in materials science, the semiconductor industry, nanotechnology and the biological, forensic, and medical sciences. This book introduces current theory and practice of electron microscopy, primarily for undergraduates who need to understand how the principles of physics apply in an area of technology that has contributed greatly to our understanding of life processes and "inner space." [Physical Principles of Electron Microscopy](#) will appeal to technologists who use electron microscopes and to graduate students, university teachers and researchers who need a concise reference on the basic principles of microscopy. [Principles and Applications of Organic Light Emitting Diodes \(OLEDs\) Woodhead Publishing](#) Principles and Applications of Organic Light Emitting Diodes (OLEDs) explores the ways in which the development of organic semiconductor materials is opening up new applications in electronic and optoelectronic luminescent devices. The book begins by covering the principles of luminescence and the luminescent properties of organic semiconductors. It then covers the development of luminescent materials for OLEDs, discussing the advantages and disadvantages of organic versus inorganic luminescent materials. The fabrication and characterization of OLEDs is also covered in detail, including information on, and comparisons of, vacuum deposition and solution techniques. Finally, applications of OLEDs are explored, including OLEDs in solid-state lighting, colored lighting, displays and potential future applications, such as ultra-thin and flexible technologies. This book is an excellent resource both for experts and newcomers to the field of organic optoelectronics and OLEDs. It is ideal for scientists working on optical devices, lighting, display and imaging technologies, and for all those engaged in research in photonics, luminescence and optical materials. Provides a one-stop guide to OLED technology for the benefit of newcomers to the field of organic optoelectronics [Comprehensively covers the luminescent properties of organic semiconductors and their development into OLED materials Offers practical information on OLED fabrication and their applications in solid-state lighting and displays, making this essential reading for optoelectronics engineers and materials scientists Further Electrical and Electronic Principles Routledge](#) Further Electrical and Electronic Principles is a core text for pre-degree courses in electrical and electronic engineering courses. The coverage of this new edition has been brought in line with the specialist unit 'Further Electrical Principles' of the 2007 BTEC National Engineering specification from Edexcel. As the book follows a logical topic progression rather than a particular syllabus, it is also suitable for other Level 3 students on vocational courses such as Vocational AS/A Level, City & Guilds courses and NVQs. More advanced material has also been included, making this text also suitable for HNC/HND and foundation degree courses. Each chapter starts with learning outcomes tied to the syllabus. All theory is explained in detail and backed up with numerous worked examples. Students can test their understanding with end of chapter assignment questions for which answers are provided. The book also includes suggested practical assignments and handy summaries of equations. In this new edition, the layout has been improved and colour has been added to make the book more accessible for students. The textbook is supported with a free companion website featuring supplementary worked examples and additional chapters. <http://books.elsevier.com/companions/9780750687478> [GaAs High-Speed Devices Physics, Technology, and Circuit Applications John Wiley & Sons](#) The performance of high-speed semiconductor devices—the genius driving digital computers, advanced electronic systems for digital signal processing, telecommunication systems, and optoelectronics—is inextricably linked to the unique physical and electrical properties of gallium arsenide. Once viewed as a novel alternative to silicon, gallium arsenide has swiftly moved into the forefront of the leading high-tech industries as an irreplaceable material in component fabrication. [GaAs High-Speed Devices](#) provides a comprehensive, state-of-the-science look at the phenomenally expansive range of engineering devices gallium arsenide has made possible—as well as the fabrication methods, operating principles, device models, novel device designs, and the material properties and physics of GaAs that are so keenly integral to their success. In a clear five-part format, the book systematically examines each of these aspects of GaAs device technology, forming the first authoritative study to consider so many important aspects at once and in such detail. Beginning with chapter 2 of part one, the book discusses such basic subjects as gallium arsenide materials and crystal properties, electron energy band structures, hole and electron transport, crystal growth of GaAs from the melt and defect density analysis. Part two describes the fabrication process of gallium arsenide devices and integrated circuits, shedding light, in chapter 3, on epitaxial growth processes, molecular beam epitaxy, and metal organic chemical vapor deposition techniques. Chapter 4 provides an introduction to wafer cleaning techniques and environment control, wet etching methods and chemicals, and dry etching systems, including reactive ion etching, focused ion beam, and laser assisted methods. Chapter 5 provides a clear overview of photolithography and nonoptical lithography techniques that include electron beam, x-ray, and ion beam lithography systems. The advances in fabrication techniques described in previous chapters necessitate an examination of low-dimension device physics, which is carried on in detail in chapter 6 of part three. Part four includes a discussion of innovative device design and operating principles which deepens and elaborates the ideas introduced in chapter 1. Key areas such as metal-semiconductor contact systems, Schottky Barrier and ohmic contact formation and reliability studies are examined in chapter 7. A detailed discussion of metal semiconductor field-effect transistors, the fabrication technology, and models and parameter extraction for device analyses occurs in chapter 8. The fifth part of the book progresses to an up-to-date discussion of heterostructure field-effect (HEMT in chapter 9), potential-effect (HBT in chapter 10), and quantum-effect devices (chapters 11 and 12), all of which are certain to have a major impact on high-speed integrated circuits and optoelectronic integrated circuit (OEIC) applications. Every facet of GaAs device technology is placed firmly in a historical context, allowing readers to see instantly the significant developmental changes that have shaped it. Featuring a look at devices still under development and device structures not yet found in the literature, [GaAs High-Speed Devices](#) also provides a valuable glimpse into the newest innovations at the center of the latest GaAs technology. An essential text for electrical engineers, materials scientists, physicists, and students, [GaAs High-Speed Devices](#) offers the first comprehensive and up-to-date look at these formidable 21st century tools. The unique physical and electrical properties of gallium arsenide has revolutionized the hardware essential to digital computers, advanced electronic systems for digital signal processing, telecommunication systems, and optoelectronics. [GaAs High-Speed Devices](#) provides the first fully comprehensive look at the enormous range of engineering devices gallium arsenide has made possible as well as the backbone of the technology—ication methods, operating principles, and the materials properties and physics of GaAs—device models and novel device designs. Featuring a clear, six-part format, the book covers: GaAs materials and crystal properties Fabrication processes of GaAs devices and integrated circuits Electron beam, x-ray, and ion beam lithography systems Metal-semiconductor contact systems Heterostructure field-effect, potential-effect, and quantum-effect devices GaAs Microwave Monolithic Integrated Circuits and Digital Integrated Circuits In addition, this comprehensive volume places every facet of the technology in an historical context and gives readers an unusual glimpse at devices still under development and device structures not yet found in the literature. [Basic Principles of Electronics Volume 2: Semiconductors Elsevier](#) Basic Principles of Electronics, Volume 2: Semiconductors focuses on the properties, applications, and characteristics of semiconductors. The publication first elaborates on conduction in the solid state, conduction and heat, and semiconductors. Discussions focus on extrinsic or impurity semiconductors, electrons and holes, effect of temperature on the conductivity, mean free path, Joule heating effect, "vacancies" in crystals, and Drude's theory of metallic conduction. The text then ponders on semiconductor technology and simple devices, transistor, and transistor production and characteristics. Topics include strain gauges, thermistors, thermoelectric semiconductors, crystal preparation, photoconductors, and the Hall effect. The book elaborates on special devices, processes, and uses, common transistor circuitry, and a low-frequency equivalent circuit for common base, including radiation detection, optoelectronics, field effect transistors, sonar amplifier, oscillators, and multi-stage amplifiers. The publication is highly recommended for technical college students and researchers wanting to study semiconductors. [Practical Injection Molding 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. [Semiconductor Devices : Basic Principles John Wiley & Sons](#) Market_Desc: · Electrical Engineers Special Features: · Over 150 solved examples that clarify concepts are integrated throughout the text. · End-of-chapter summary tables and hundreds of figures are included to reinforce the intricacies of modern semiconductor devices. Coverage of device optimization issues shows the reader how in each device one has to trade one performance against another About The Book: This introductory text presents a well-balanced coverage of semiconductor physics and device operation and shows how devices are optimized for applications. The text begins with an exploration of the basic physical processes upon which all semiconductor devices are based. Next, the author focuses on the operation of the important semiconductor devices along with issues relating to the optimization of device performance. [Nanoelectronics Materials, Devices, Applications, 2 Volumes John Wiley & Sons](#) Offering first-hand insights by top scientists and industry experts at the forefront of R&D into nanoelectronics, this book neatly links the underlying technological principles with present and future applications. A brief introduction is followed by an overview of present and emerging logic devices, memories and power technologies. Specific chapters are dedicated to the enabling factors, such as new materials, characterization techniques, smart manufacturing and advanced circuit design. The second part of the book provides detailed coverage of the current state and showcases real future applications in a wide range of fields: safety, transport, medicine, environment, manufacturing, and social life, including an analysis of emerging trends in the internet of things and cyber-physical systems. A survey of main economic factors and trends concludes the book. Highlighting the importance of nanoelectronics in the core fields of

communication and information technology, this is essential reading for materials scientists, electronics and electrical engineers, as well as those working in the semiconductor and sensor industries. **Electrical and Electronic Principles and Technology** [Taylor & Francis](#) This practical resource introduces electrical and electronic principles and technology covering theory through detailed examples, enabling students to develop a sound understanding of the knowledge required by technicians in fields such as electrical engineering, electronics and telecommunications. No previous background in engineering is assumed, making this an ideal text for vocational courses at Levels 2 and 3, foundation degrees and introductory courses for undergraduates. **Principles of Photonic Integrated Circuits Materials, Device Physics, Guided Wave Design** [Springer Nature](#) This graduate-level textbook presents the principles, design methods, simulation, and materials of photonic circuits. It provides state-of-the-art examples of silicon, indium phosphide, and other materials frequently used in these circuits, and includes a thorough discussion of all major types of devices. In addition, the book discusses the integrated photonic circuits (chips) that are currently increasingly employed on the international technology market in connection with short-range and long-range data communication. Featuring references from the latest research in the field, as well as chapter-end summaries and problem sets, **Principles of Photonic Integrated Circuits** is ideal for any graduate-level course on integrated photonics, or optical technology and communication.