

Semiconductor Physics Devices 4th Edition Solutions

Fundamentals of Semiconductors
The Physics of Semiconductors
Modern Physics, Loose-Leaf
Geographic Information Systems and Science
Semiconductor Physics
Basic Semiconductor Physics
CRC Materials Science and Engineering Handbook
Semiconductor Device Physics and Design
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Medical Imaging Physics
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Principles of Electrical Engineering Materials and Devices
Electronic Properties of Materials
Semiconductor Physics and Devices

Fundamentals of Semiconductors

This book provides one of the most rigorous treatments of compound semiconductor device physics yet published. A complete understanding of modern devices requires a working knowledge of low-dimensional physics, the use of statistical methods, and the use of one-, two-, and three-dimensional analytical and numerical analysis techniques. With its systematic and detailed**discussion of these topics, this book is ideal for both the researcher and the student. Although the emphasis of this text is on compound semiconductor devices, many of the principles discussed will also be useful to those interested in silicon devices. Each chapter ends with exercises that have been designed to reinforce concepts, to complement arguments or derivations, and to emphasize the nature of approximations by critically evaluating realistic conditions. One of the most rigorous treatments of compound semiconductor device physics yet published**Essential reading for a complete understanding of modern devices**Includes chapter-ending exercises to facilitate understanding

The Physics of Semiconductors

Modern Physics, Loose-Leaf

Geographic Information Systems and Science

Quantum Wells, Wires and Dots Second Edition: Theoretical and Computational Physics of Semiconductor Nanostructures provides all the essential information, both theoretical and computational, for complete beginners to develop an understanding of how the electronic, optical and transport properties of quantum wells, wires and dots are calculated. Readers are lead through a series of simple theoretical and computational examples giving solid foundations from which they will gain the confidence to initiate theoretical investigations or explanations of their own. Emphasis on combining the analysis and interpretation of experimental data with the development of theoretical ideas Complementary to the more standard texts Aimed at the physics community at large, rather than just the low-dimensional semiconductor expert The text present solutions for a large number of real situations Presented in a lucid style with easy to follow steps related to accompanying illustrative examples

Semiconductor Physics

This book presents those terms, concepts, equations, and models that are routinely used in describing the operational behavior of solid state devices. The second edition provides many new problems and illustrative examples.

Basic Semiconductor Physics

CRC Materials Science and Engineering Handbook

The awaited revision of Semiconductor Devices: Physics and Technology offers more than 50% new or revised material that reflects a multitude of important discoveries and advances in device physics and integrated circuit processing. Offering a basic introduction to physical principles of modern semiconductor devices and their advanced fabrication technology, the third edition presents students with theoretical and practical aspects of every step in device characterizations and fabrication, with an emphasis on integrated circuits. Divided into three parts, this text covers the basic properties of semiconductor materials, emphasizing silicon and gallium arsenide; the physics and characteristics of semiconductor devices bipolar, unipolar special microwave and photonic devices; and the latest processing technologies, from crystal growth to lithographic pattern transfer.

Semiconductor Device Physics and Design

The 3rd edition of this successful textbook contains ample material for a comprehensive upper-level undergraduate or beginning graduate course, guiding readers to the point where they can choose a special topic and begin supervised research. The textbook provides a balance between essential aspects of solid-state and semiconductor physics, on the one hand,

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and the principles of various semiconductor devices and their applications in electronic and photonic devices, on the other. It highlights many practical aspects of semiconductors such as alloys, strain, heterostructures, nanostructures, that are necessary in modern semiconductor research but typically omitted in textbooks. Coverage also includes additional advanced topics, such as Bragg mirrors, resonators, polarized and magnetic semiconductors, nanowires, quantum dots, multi-junction solar cells, thin film transistors, carbon-based nanostructures and transparent conductive oxides. The text derives explicit formulas for many results to support better understanding of the topics. The Physics of Semiconductors requires little or no prior knowledge of solid-state physics and evolved from a highly regarded two-semester course. In the third edition several topics are extended and treated in more depth including surfaces, disordered materials, amorphous semiconductors, polarons, thermopower and noise. More than 1800 references guide the reader to historic and current literature including original and review papers and books.

Compound Semiconductor Device Physics

Introduction to Semiconductor Device Physics is a popular and established text that offers a thorough introduction to the underlying physics of semiconductor devices. It begins with a review of basic solid state physics, then goes on to describe the properties of semiconductors including energy bands,

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the concept of effective mass, carrier concentration, and conduction in more detail. Thereafter the book is concerned with the principles of operation of specific devices, beginning with the Gunn Diode and the p-n junction. The remaining chapters cover the on specific devices, including the LED, the bipolar transistor, the field-effect transistor, and the semiconductor laser. The book concludes with a chapter providing a brief introduction to quantum theory. Not overtly mathematical, Introduction to Semiconductor Device Physics introduces only those physical concepts required for an understanding of the semiconductor devices being considered. The author's intuitive style, coupled with an extensive set of worked problems, make this the ideal introductory text for those concerned with understanding electrical and electronic engineering, applied physics, and related subjects.

The Physics of Semiconductor Devices

Resistivity -- Carrier and doping density -- Contact resistance and Schottky barriers -- Series resistance, channel length and width, and threshold voltage -- Defects -- Oxide and interface trapped charges, oxide thickness -- Carrier lifetimes -- Mobility -- Charge-based and probe characterization -- Optical characterization -- Chemical and physical characterization -- Reliability and failure analysis.

Semiconductor Devices: Physics and Technology, 3rd Edition

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One of the field's most respected introductory texts, *Modern Physics* provides a deep exploration of fundamental theory and experimentation. Appropriate for second-year undergraduate science and engineering students, this esteemed text presents a comprehensive introduction to the concepts and methods that form the basis of modern physics, including examinations of relativity, quantum physics, statistical physics, nuclear physics, high energy physics, astrophysics, and cosmology. A balanced pedagogical approach examines major concepts first from a historical perspective, then through a modern lens using relevant experimental evidence and discussion of recent developments in the field. The emphasis on the interrelationship of principles and methods provides continuity, creating an accessible "storyline" for students to follow. Extensive pedagogical tools aid in comprehension, encouraging students to think critically and strengthen their ability to apply conceptual knowledge to practical applications. Numerous exercises and worked examples reinforce fundamental principles.

Semiconductor Physics

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

Integrated Microelectronic Devices

The second edition of a bestseller, this book presents

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the latest innovative research methods that help break new ground by applying patterns, reuse, and design science to research. The book relies on familiar patterns to provide the solid fundamentals of various research philosophies and techniques as touchstones that demonstrate how to innovate research methods. Filled with practical examples of applying patterns to IT research with an emphasis on reusing research activities to save time and money, this book describes design science research in relation to other information systems research paradigms such as positivist and interpretivist research.

Physics in Biology and Medicine

This book covers properties, processing, and applications of conducting polymers. It discusses properties and characterization, including photophysics and transport. It then moves to processing and morphology of conducting polymers, covering such topics as printing, thermal processing, morphology evolution, conducting polymer composites, thin films

Physics of Semiconductor Devices

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

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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.

Semiconductor Fundamentals

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

Conjugated Polymers

This edition includes new material on the devices used for optical fibre communication, on the new semiconductor alloys, and on the properties of multiple thin layers of semiconductor. The treatment of MOS devices is brought into line with that used in the SPICE circuit simulation technique.

Semiconductor Physics And Devices

CRC Materials Science and Engineering Handbook provides a convenient, single-volume source for physical and chemical property data on a wide range of engineering materials. As with the first three editions, this Fourth Edition contains information verified by major professional associations such as ASM International and the American Ceramic Society

Quantum Wells, Wires and Dots

A modern take on microelectronic device engineering Microelectronics is a 50-year-old engineering discipline still undergoing rapid evolution and societal adoption. Integrated Microelectronic Devices: Physics and Modeling fills the need for a rigorous description of semiconductor device physics that is relevant to modern nanoelectronics. The central goal is to present the fundamentals of semiconductor device operation with relevance to modern integrated microelectronics. Emphasis is devoted to frequency response, layout, geometrical effects, parasitic issues and modeling in integrated microelectronics devices

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(transistors and diodes). In addition to this focus, the concepts learned here are highly applicable in other device contexts. This text is suitable for a one-semester junior or senior-level course by selecting the front sections of selected chapters (e.g. 1-9). It can also be used in a two-semester senior-level or a graduate-level course by taking advantage of the more advanced sections.

Nanostructured Semiconductors

An Introduction to Semiconductor Devices by Donald Neamen provides an understanding of the characteristics, operations and limitations of semiconductor devices. In order to provide this understanding, the book brings together the fundamental physics of the semiconductor material and the semiconductor device physics. This new text provides an accessible and modern presentation of material. Quantum mechanic material is minimal, and the most advanced material is designated with an icon. This modern approach means that coverage of the MOS transistor precedes the material on the bipolar transistor, which reflects the dominance of MOS technology in today's world. Excellent pedagogy is present throughout the book in the form of interesting chapters openers, worked examples, a variety of exercises, key terms, and end of chapter problems.

The Physics of Semiconductor Devices

This comprehensive publication covers all aspects of image formation in modern medical imaging

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modalities, from radiography, fluoroscopy, and computed tomography, to magnetic resonance imaging and ultrasound. It addresses the techniques and instrumentation used in the rapidly changing field of medical imaging. Now in its fourth edition, this text provides the reader with the tools necessary to be comfortable with the physical principles, equipment, and procedures used in diagnostic imaging, as well as appreciate the capabilities and limitations of the technologies.

Understanding Lasers

The first edition of Geographic Information Systems and Science has taken the GIS textbook market by storm, selling over 22,000 copies since publication. It is the most current, authoritative and comprehensive treatment of the field, that goes from fundamental principles to the big picture. GISS 2e builds on the success of the first edition: Completely revised with a new five part structure: Foundations; Principles; Techniques; Analysis; Management and Policy All new personality boxes of current GIS practitioners New chapters on Distributed GIS, Map Production, Geovisualization, Modeling, and Managing GIS Specific coverage of current hot topics: GIS and the New World Order Security, health and well-Being Digital differentiation in GIS consumption The core organizing role of GIS in geography The greening of GIS Grand challenges of GIS science Science and explanation A new suite of instructor resources including a companion website with an on-line lab resource and personal student sullabus and a

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comprehensive Instructor's Manual that maps the textbook to various disciplines and levels of courses.

Semiconductor Device Fundamentals

Semiconductor Physics

The first edition of "Semiconductor Physics" was published in 1973 by Springer-Verlag Wien-New York as a paperback in the Springer Study Edition. In 1977, a Russian translation by Professor Yu. K. Pozhela and coworkers at Vilnius/USSR was published by Izdatelstvo "MIR", Moscow. Since then new ideas have been developed in the field of semiconductors such as electron hole droplets, dangling bond saturation in amorphous silicon by hydrogen, or the determination of the fine structure constant from surface quantization in inversion layers. New techniques such as molecular beam epitaxy which has made the realization of the Esaki superlattice possible, deep level transient spectroscopy, and refined a. c. Hall techniques have evolved. Now that the Viennese edition is about to go out of print, Springer-Verlag, Berlin-Heidelberg-New York is giving me the opportunity to include these new subjects in a monograph to appear in the Solid-State Sciences series. Again it has been the intention to cover the field of semiconductor physics comprehensively, although some chapters such as diffusion of hot carriers and their galvanomagnetic phenomena, as well as superconducting degenerate semiconductors and the appendices, had to go for commercial

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reasons. The emphasis is more on physics than on device aspects.

Physics for Scientists and Engineers

Provides a basis for understanding the characteristics, operation, and limitations of semiconductor devices. This title deals with the electrical properties and characteristics of semiconductor materials and devices. It intends to bring together quantum mechanics, the quantum theory of solids, and semiconductor material physics.

Semiconductor Physics and Devices

Semiconductor Physics and Devices provides an introduction to the physics of semiconductor materials and devices. The text is supported by a large number of examples and exercises to test the understanding of topics.

Fundamentals of Solid State Engineering

This third edition covers topics in physics as they apply to the life sciences, specifically medicine, physiology, nursing and other applied health fields. It includes many figures, examples and illustrative problems and appendices which provide convenient access to the most important concepts of mechanics, electricity, and optics.

About Face

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The new edition of this textbook presents a detailed description of basic semiconductor physics. The text covers a wide range of important phenomena in semiconductors, from the simple to the advanced. Four different methods of energy band calculations in the full band region are explained: local empirical pseudopotential, non-local pseudopotential, KP perturbation and tight-binding methods. The effective mass approximation and electron motion in a periodic potential, Boltzmann transport equation and deformation potentials used for analysis of transport properties are discussed. Further, the book examines experiments and theoretical analyses of cyclotron resonance in detail. Optical and transport properties, magneto-transport, two-dimensional electron gas transport (HEMT and MOSFET) and quantum transport are reviewed, while optical transition, electron-phonon interaction and electron mobility are also addressed. Energy and electronic structure of a quantum dot (artificial atom) are explained with the help of Slater determinants. The physics of semiconductor lasers is also described, including Einstein coefficients, stimulated emission, spontaneous emission, laser gain, double heterostructures, blue lasers, optical confinement, laser modes, and strained quantum well lasers, offering insights into the physics of various kinds of semiconductor lasers. In this third edition, energy band calculations in full band zone with spin-orbit interaction are presented, showing all the matrix elements and equipping the reader to prepare computer programs of energy band calculations. The Luttinger Hamiltonian is discussed and used to analyze the valence band structure. Numerical

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calculations of scattering rate, relaxation time, and mobility are presented for typical semiconductors, which are very helpful for understanding of transport. Energy band structures and effective masses of nitrides such as GaN, InN, AlN and their ternary alloys are discussed because they are very important materials for the blue light emission, and high power devices with and high frequency. Learning and teaching with this textbook is supported by problems and solutions in the end of the chapters. The book is written for bachelor and upper undergraduate students of physics and engineering.

Conjugated Polymers

The new edition of the most detailed and comprehensive single-volume reference on major semiconductor devices The Fourth Edition of Physics of Semiconductor Devices remains the standard reference work on the fundamental physics and operational characteristics of all major bipolar, unipolar, special microwave, and optoelectronic devices. This fully updated and expanded edition includes approximately 1,000 references to original research papers and review articles, more than 650 high-quality technical illustrations, and over two dozen tables of material parameters. Divided into five parts, the text first provides a summary of semiconductor properties, covering energy band, carrier concentration, and transport properties. The second part surveys the basic building blocks of semiconductor devices, including p-n junctions, metal-semiconductor contacts, and metal-insulator-

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semiconductor (MIS) capacitors. Part III examines bipolar transistors, MOSFETs (MOS field-effect transistors), and other field-effect transistors such as JFETs (junction field-effect-transistors) and MESFETs (metal-semiconductor field-effect transistors). Part IV focuses on negative-resistance and power devices. The book concludes with coverage of photonic devices and sensors, including light-emitting diodes (LEDs), solar cells, and various photodetectors and semiconductor sensors. This classic volume, the standard textbook and reference in the field of semiconductor devices: Provides the practical foundation necessary for understanding the devices currently in use and evaluating the performance and limitations of future devices Offers completely updated and revised information that reflects advances in device concepts, performance, and application Features discussions of topics of contemporary interest, such as applications of photonic devices that convert optical energy to electric energy Includes numerous problem sets, real-world examples, tables, figures, and illustrations; several useful appendices; and a detailed solutions manual Explores new work on leading-edge technologies such as MODFETs, resonant-tunneling diodes, quantum-cascade lasers, single-electron transistors, real-space-transfer devices, and MOS-controlled thyristors

Physics of Semiconductor Devices, Fourth Edition is an indispensable resource for design engineers, research scientists, industrial and electronics engineering managers, and graduate students in the field.

An Introduction to Semiconductor Devices

The expanded fourth edition of the book that offers an essential introduction to laser technology and the newest developments in the field The revised and updated fourth edition of Understanding Lasers offers an essential guide and introduction that explores how lasers work, what they do, and how they are applied in the real world. The author—a Fellow of The Optical Society—reviews the key concepts of physics and optics that are essential for understanding lasers and explains how lasers operate. The book also contains information on the optical accessories used with lasers. Written in non-technical terms, the book gives an overview of the wide-variety laser types and configurations. Understanding Lasers covers fiber, solid-state, excimer, helium-neon, carbon dioxide, free-electron lasers, and more. In addition, the book also explains concepts such as the difference between laser oscillation and amplification, the importance of laser gain, and tunable lasers. The updated fourth edition highlights the most recent research and development in the field. This important resource: Includes a new chapter on fiber lasers and amplifiers Reviews new topics on physics of optical fibers and fiber lasers, disk lasers, and Ytterbium lasers Contains new sections on Laser Geometry and Implications, Diode Laser Structures, Optimal Parametric Sources, and 3D Printing and Additive Manufacturing Puts the focus on research and emerging developments in areas such as spectroscopy, slow light, laser cooling, and extremely

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precise measurements Contains appendices, glossary, and index that help make this book a useful reference Written for engineering and physics students, engineers, scientists, and technicians, the fourth edition of Understanding Lasers contains the basic concepts of lasers and the most recent advances in the technology.

Microelectronics Circuit Analysis and Design

Semiconductor Device Physics and Design teaches readers how to approach device design from the point of view of someone who wants to improve devices and can see the opportunity and challenges. It begins with coverage of basic physics concepts, including the physics behind polar heterostructures and strained heterostructures. The book then details the important devices ranging from p-n diodes to bipolar and field effect devices. By relating device design to device performance and then relating device needs to system use the student can see how device design works in the real world.

Semiconductor Material and Device Characterization

Introductory Semiconductor Device Physics

Nanostructured Semiconductors focuses on the development of semiconductor nanocrystals, their

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technologies and applications, including energy harvesting, solar cells, solid oxide fuel cells, and chemical sensors. Semiconductor oxides are used in electronics, optics, catalysts, sensors, and other functional devices. In their 2D form, the reduction in size confers exceptional properties, useful for creating faster electronics and more efficient catalysts. Since the first edition of the book, there has been significant progress in the development of new functional nanomaterials with unique and sometimes unpredictable quantum-confined properties within the class what it called two-dimensional (2D) semiconductors. These nanocrystals represent extremely thin nano-structures with thickness of just few nano-meters. Since that time, not only were 2D semiconductor oxides further developed, more importantly, 2D metal dichalcogenides, such as MoS₂, MoSe₂, WS₂, WSe₂ and others also progressed significantly in their development demonstrating their superior properties compared to their bulk and microstructural counterparts. The book has been expanded to include these advancements. The book begins with the structure and properties of semiconductor nanocrystals (chapter 1), addresses electronic device applications (chapter 2), discusses 2-Dimensional oxides and dichalcogenide semiconductors (chapters 3 through 5), and ends with energy, environment, and bio applications (chapters 6 through 8). Focuses on the development of semiconductor nanocrystals and their technologies and applications, including energy harvesting, solar cells, solid oxide fuel cells and chemical sensors Include other 2D materials, such as dichalcogenides to present a comprehensive resource on the latest

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advancements in nanostructured semiconductors
Reviews the fundamental physics of conductivity and electron arrangement before proceeding to practical applications
Contains a unique chapter dedicated to the new atomic layer deposition (ALD) technique which has the ability to develop 2D nanostructures with great precision

Handbook of Drug Metabolism, Third Edition

This junior level electronics text provides a foundation for analyzing and designing analog and digital electronics throughout the book. Extensive pedagogical features including numerous design examples, problem solving technique sections, Test Your Understanding questions, and chapter checkpoints lend to this classic text. The author, Don Neamen, has many years experience as an Engineering Educator. His experience shines through each chapter of the book, rich with realistic examples and practical rules of thumb. The Third Edition continues to offer the same hallmark features that made the previous editions such a success. Extensive Pedagogy: A short introduction at the beginning of each chapter links the new chapter to the material presented in previous chapters. The objectives of the chapter are then presented in the Preview section and then are listed in bullet form for easy reference. Test Your Understanding Exercise Problems with provided answers have all been updated. Design Applications are included at the end of chapters. A specific electronic design related to that chapter is presented.

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The various stages in the design of an electronic thermometer are explained throughout the text. Specific Design Problems and Examples are highlighted throughout as well.

Medical Imaging Physics

The Fourth Edition of the Handbook of Conducting Polymers, Two-Volume Set continues to be the definitive resource on the topic of conducting polymers. Completely updated with an extensive list of authors that draws on past and new contributors, the book takes into account the significant developments both in fundamental understanding and applications since publication of the previous edition. One of two volumes comprising the comprehensive Handbook, Conjugated Polymers: Perspective, Theory, and New Materials features new chapters on the fundamental theory and new materials involved in conducting polymers. It discusses the history of physics and chemistry of these materials and the theory behind them. Finally, it details polymer and materials chemistry including such topics as conjugated block copolymers, metal-containing conjugated polymers, and continuous flow processing. Aimed at researchers, advanced students, and industry professionals working in materials science and engineering, this book covers fundamentals, recent progress, and new materials involved in conducting polymers and includes a wide-ranging listing of comprehensive chapters authored by an international team of experts.

Microelectronics

It is quite satisfying for an author to learn that his brainchild has been favorably accepted by students as well as by professors and thus seems to serve some useful purpose. This horizontally integrated text on the electronic properties of metals, alloys, semiconductors, insulators, ceramics, and polymeric materials has been adopted by many universities in the United States as well as abroad, probably because of the relative ease with which the material can be understood. The book has now gone through several reprinting cycles (among them a few pirate prints in Asian countries). I am grateful to all readers for their acceptance and for the many encouraging comments which have been received. I have thought very carefully about possible changes for the second edition. There is, of course, always room for improvement. Thus, some rewording, deletions, and additions have been made here and there. I withstood, however, the temptation to expand considerably the book by adding completely new subjects. Nevertheless, a few pages on recent developments needed to be inserted. Among them are, naturally, the discussion of ceramic (high-temperature) superconductors, and certain elements of the rapidly expanding field of optoelectronics. Further, I felt that the readers might be interested in learning some more practical applications which result from the physical concepts which have been treated here.

Physics of Semiconductor Devices

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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.

Principles of Electrical Engineering Materials and Devices

This text brings together traditional solid-state approaches from the 20th century with developments of the early part of the 21st century, to reach an understanding of semiconductor physics in its multifaceted forms. It reveals how an understanding of what happens within the material can lead to insights into what happens in its use.

Electronic Properties of Materials

Special Features *Computer-based exercises and homework problems -- unique to this text and comprising 25% of the total number of problems -- encourage students to address realistic and challenging problems, experiment with what if scenarios, and easily obtain graphical outputs. Problems are designed to progressively enhance MATLAB-use proficiency, so students need not be familiar with MATLAB at the start of your course. Program scripts that are answers to exercises in the text are available at no charge in electronic form (see Teaching Resources below). *Supplement and Review Mini-Chapters after each of the text's three parts contain an extensive review list of terms, test-like problem sets with answers, and detailed suggestions on supplemental reading to reinforce students' learning and help them prepare for exams. *Read-Only Chapters, strategically placed to provide a change of pace during the course, provide informative, yet enjoyable reading for students. *Measurement Details and Results samples offer students a realistic perspective on the seldom-perfect nature of device characteristics, contrary to the way they are often represented in introductory texts.

Content Highlig

Semiconductor Physics and Devices

The essential interaction design guide, fully revised and updated for the mobile age About Face: The Essentials of Interaction Design, Fourth Edition is the

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latest update to the book that shaped and evolved the landscape of interaction design. This comprehensive guide takes the worldwide shift to smartphones and tablets into account. New information includes discussions on mobile apps, touch interfaces, screen size considerations, and more. The new full-color interior and unique layout better illustrate modern design concepts. The interaction design profession is blooming with the success of design-intensive companies, priming customers to expect "design" as a critical ingredient of marketplace success. Consumers have little tolerance for websites, apps, and devices that don't live up to their expectations, and the responding shift in business philosophy has become widespread. About Face is the book that brought interaction design out of the research labs and into the everyday lexicon, and the updated Fourth Edition continues to lead the way with ideas and methods relevant to today's design practitioners and developers. Updated information includes: Contemporary interface, interaction, and product design methods Design for mobile platforms and consumer electronics State-of-the-art interface recommendations and up-to-date examples Updated Goal-Directed Design methodology Designers and developers looking to remain relevant through the current shift in consumer technology habits will find About Face to be a comprehensive, essential resource.

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