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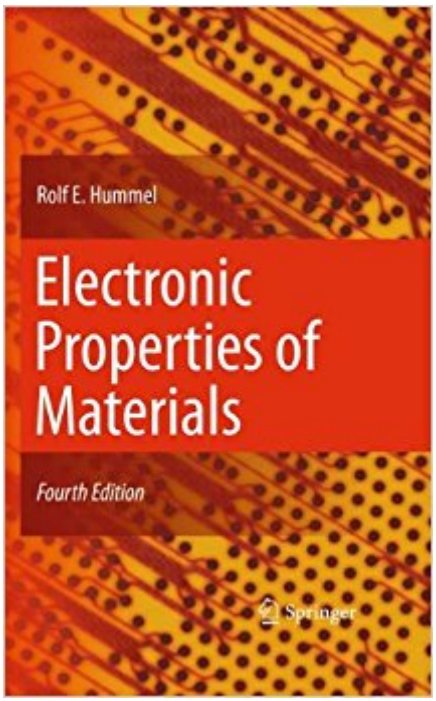
Electronic Properties Of Materials



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Synopsis

This text on the electrical, optical, magnetic, and thermal properties of materials stresses concepts rather than mathematical formalism. Suitable for advanced undergraduates, it is intended for materials and electrical engineers who want to gain a fundamental understanding of alloys, semiconductor devices, lasers, magnetic materials, and so forth. The book is organized to be used in a one-semester course; to that end each section of applications, after the introduction to the fundamentals of electron theory, can be read independently of the others. Many examples from engineering practice serve to provide an understanding of common devices and methods. Among the modern applications covered are: high-temperature superconductors, optoelectronic materials, semiconductor device fabrication, xerography, magneto-optic memories, and amorphous ferromagnetics. The fourth edition has been revised and updated with an emphasis on the applications sections, which now cover devices of the next generation of electronics.

Book Information

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Customer Reviews

From the reviews of the fourth edition:Ã¢â ¬Å“This is an excellent book for materials and electrical engineers, as well as advanced students. This book is divided into five distinct and self-contained parts, which makes it easier for the reader to find information on a particular area of interest. Ã¢â ¬Â¦ contains many applications and problems that help to bridge the gap between physics and engineering. Ã¢â ¬Â¦ For practicing engineers, this would be a good reference book. It would also be useful for someone looking to gain an overall concept of device physics.Ã¢â ¬Â• (Ishtiaque Ahmed, Optics & Photonics News, April, 2012)

This book on electrical, optical, magnetic, and thermal properties of materials differs from other introductory texts in solid-state physics. First, it is written for engineers, particularly materials and electrical engineers, who what to gain a fundamental understanding of semiconductor devices, magnetic materials, lasers, alloys, and so forth. Second, it stresses concepts rather than mathematical formalism, which should make the presentation relatively easy to read. Third, it is not an encyclopedia: The topics are restricted to material considered to be essential and that can be covered in one 15-week semester.The book is divided into five parts. The first part, "Fundamentals of Electron Theory," introduces the essential quantum mechanical concepts needed for understanding materials science; the other parts may be read independently of each other. Many practical applications are discussed to provide students with an understanding of electronic devices currently in use. The solutions to the numerical problems are given in the appendix.Previous editions have been well received by students and teachers alike. This Fourth Edition has again been thoroughly revised and brought up to date to take into account the explosive developments in electrical, optical, and magnetic materials and devices. Specifically, new topics have been added in the "applied sections," such as energy saving light sources, particularly compact fluorescence light fixtures, organic light-emitting diodes (OLEDs), organic photovoltaics (OPV cells), optical fibers,Ã Â pyroelectricity, phase-change memories, blue ray disks, holographic versatile disks, galvanoelectric phenomena (emphasizing the entire spectrum of primary and rechargeable batteries), graphene, quantum Hall effect, iron-based semiconductors (pnictides), etc. to mention just a few subjects.

Thank you.

This is an excellent text for every electrical engineering student whether graduate or undergraduate. I found the information to be clear and concise which made the concepts easily manageable. The use of mathematical formulas are placed in such a way as to aid with the reading rather than to be overbearing as other solid-state physics texts can be. The author does a great job in sectioning the book into parts, thereby making it easier to focus on a particular area of interest without having to hunt for the deisred information. For practicing engineers, this is a good reference book, especially if you are looking to gain a further understanding of device physics.

It fails to satisfy my expectations in semiconductor electronics. It is just okay not more.

I have read many textbooks as an Engineering student. This is the best.Very helpful Appendices that I have even referred to in other classes. Well organized chapters. Thorough and easy (relatively speaking) explanations.My only complaint is chapter in-balance; Some chapters are only a few pages while others seem to last forever.

The book has a very simplified description for Electronic Properties of Materials. It does not go too much in depth in derivations etc. But at the same time it is good enough to give an overall flavor for electronic,optical, magnetic properties of materrials. This book is good for engineers. But for more depth understanding of quantum mechanics you might want to refer to other books.

Book Just as described and in great condition. Purchased this for a class and the professor never ended up using it, so I didn't reading read it much and cannot attest to the value of its content on the subject.

I brought for my friends and she told the price is good as well as the book is in good condition.

Very good introduction to the subject.

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