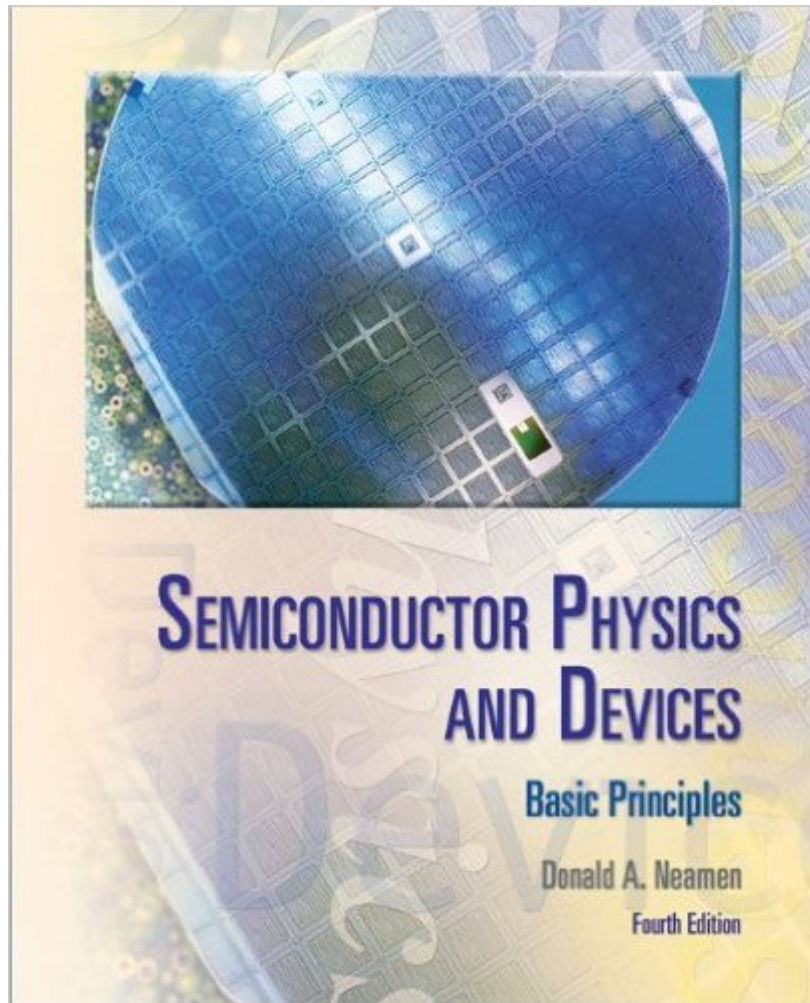


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# Semiconductor Physics And Devices: Basic Principles



## Synopsis

With its strong pedagogy, superior readability, and thorough examination of the physics of semiconductor material, *Semiconductor Physics and Devices*, 4/e provides a basis for understanding the characteristics, operation, and limitations of semiconductor devices. Neamen's *Semiconductor Physics and Devices* deals with the electrical properties and characteristics of semiconductor materials and devices. The goal of this book is to bring together quantum mechanics, the quantum theory of solids, semiconductor material physics, and semiconductor device physics in a clear and understandable way.

## Book Information

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## Customer Reviews

I'm currently using this book for a class in solid state electronics and I feel this covers the topics very well. There are lots of examples throughout the book with problems given right after them, which are similar to the examples. I really liked this because I felt that it gives readers an opportunity to practice and understand the material better as they read through it. So far we have found one mistake in one of the problems, but its just a typo and its easy to figure out what's meant. I've heard that the previous editions had several mistakes that have been corrected in this one, the 4th edition, so if you can afford it, you might want to consider getting this one. I haven't read the whole book, and don't intent to, but from what I've read so far, I've felt that everything was clear and flowed well. There are derivations given for most of the formulas used in the book. I usually skip over them, but if you'd like to study them, they're there.

I was required to use this book for a semiconductor class in college. The book is written at a unnecessarily high level, often using more complex words to describe simple concepts. The book also focusses too much time on deriving equations, in my opinion. It seems like this is the number one focus most of the time, instead of the actual concept and use for the derived information. The examples that are given are generally good, though a few of them lack good explanation as to why they did something. Examples seem to have been sacrificed for long derivations. Major formulas and concepts are not introduced well, often the book assumes you know something and the first time you see it is in an example. Sometimes, you were just expected to have read the appendix, with hardly any indication. Even when the book does show major formulas and concepts, they are often not highlighted in any way and it's easy to lose them in the many formulas used while deriving equations. Some sections of the book claim to be optional, however future sections often refer to information from these "optional" sections. There were a few typos, but nothing too major, I think the worst one I found simply made an example problem impossible. Overall, this book is not good for learning physics concepts at all, though I suppose if you wanted to dive deep into how formulas and concepts are found, it might be a good choice.

This book was part of my university studies and it was an absolutely wonderful book to learn from. It also makes a great resource tool for those who need the fundamental knowledge of quantum mechanics and energy diagrams for semiconductor devices. The book is well written and consists of many supporting diagrams which help aid in the understanding of the descriptions. You learn about basic quantum mechanics, simple material science and device physics (which includes band diagrams of different materials from homogeneous to heterojunctions). I definitely recommend this book to people who seek interest in this area!

This was assigned for my Semiconductors intro class and I have to say it was the only textbook I've actually read the assigned chapters all the way through in my college career and otherwise. I did all the practice problems and then some. It helped immensely in this class, and I recommend it to anyone interested in semiconductors. Great for undergraduate intro classes.

FYI to students: I've got both the U.S. 4th edition by Donald Neamen and the international edition [advertised as the same 4th edition] by both Donald Neamen and Dhruves Biswas. They're about 60%-70% the same. The first chapter is completely different and the second chapter is missing. The

chapter introductions are usually different, but of most of the meat of most of the chapters are exactly the same, word for word. The problems at the end of the first chapter are completely different, and in the rest of the chapters they're occasionally slightly different ... it varies. I've gotten other international edition of texts which are identical to the original, but if there's an ie of this text which is identical it's definitely NOT this one. The isbn-13 is 9780071070102. I've only just started this course myself and have only finished the first chapter. So I can't say yet if the text is a good one, but so far it seems readable.

Very densely written, really high level stuff and if you are trying to learn 'basic principles' you will have a very hard time with this textbook. Luckily a lot of the answers are on Chegg.

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