VLSI circuits are ubiquitous in the modern world, and designing them efficiently is becoming increasingly challenging with the development of ever smaller chips. This practically oriented textbook covers the important aspects of VLSI design using a top-down approach, reflecting the way digital circuits are actually designed. Using practical hints and tips, case studies and checklists, this comprehensive guide to how and when to design VLSI circuits, covers the advances, challenges and past mistakes in design, acting as an introduction to graduate students and a reference for practising electronic engineers.

My Personal Review:
This book gives a top-down approach of designing latest digital integrated circuits by covering all topics of integrated digital circuit design within over 800 pages.
I can recommend this book for people who already have basic knowledge of IC design and want to get a closer look over the whole topic and problems that arise in present technologies and research.
The author starts from the top level of system integration down to the CMOS devices, physics and their problems for designing circuits. He also provides information to semiconductor business and workflow of the industry as well as functionality of EDA tools.
Each Chapters starts with a few words on the current contexts and ends with several short problems for self studying and an appendix with more information leading to even more resources.
The knowledge is enhanced by definitions and many very helpful observations. Theories often contain real life examples and also some guidelines for designers, in addition many examples with data values from present devices from famous manufacturers are given.
In contrast to usual books, the author starts with architectures and techniques, like pipelining, replication and time sharing for implementing algorithms.

Next he explains hardware description languages on the example of VHDL, yet the focus of this chapter is not the syntax of VHDL but processing of VHDL and its impact on the design. Also there are some examples for the major circuits and guidelines that are used within a design.

This is followed by timing and clocking techniques for digital circuits. Here synchronous and asynchronous disciplines and characterizations of all different types of phase and edge triggered clocks in a design are described. This part also faces all problems of asynchronous data handling, and how to circumvent its drawbacks. All explanations are illustrated with helpful timing diagrams and figures of common circuit configurations.

Finally, it starts to get into gate and transistor level design. Basics of CMOS behavior and logic gates are illustrated, extended by considerations on energy dissipation, supply voltage drop and noise on a die, physical models for the design and electrical characteristics. Verification techniques of functionality and design are explained along with the design flow of EDA tools.

A very nice and rather exotic part of the book is the chapter "VLSI Economics and Project Management". There is all kind of workflows, cost models and market sides discussed and displayed in an overview.

The book is completed by a chapter on semiconductor physics, functionality of CMOS devices and outlooks to the CMOS Technology of tomorrow.

As a solely negative point remains: there are too many topics. Many problems are shown and explained, but don't have a detailed solution. The author countervails this situation by giving good references to work on further and support material at the publishers homepage.

For More 5 Star Customer Reviews and Lowest Price:
Digital Integrated Circuit Design: From VLSI Architectures to CMOS Fabrication by Hubert Kaeslin - 5 Star Customer Reviews and Lowest Price!