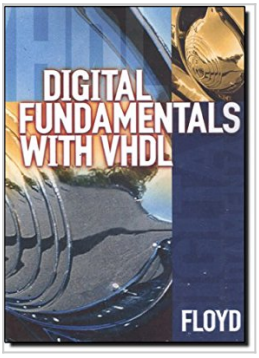

Digital Fundamentals with VHDL

By Thomas L. Floyd

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Adapted from Floyd's best-selling *Digital Fundamentals*—widely recognized as the authority in digital electronics—this book also applies basic VHDL concepts to the description of logic circuits. It introduces digital logic concepts and functions in the same way as the original book, but with an emphasis on PLDs rather than fixed-function logic devices. Reflects the trend away from fixed-function logic devices with an emphasis on CPLDs and FPGAs, while offering coverage of fixed-function logic for reference. Presents VHDL as a tool for implementing the digital logic in programmable logic devices. Offers complete, up-to-date coverage, from the basic digital logic concepts to the latest in digital signal processing. Emphasizes applications and troubleshooting. Provides Digital System Applications in most chapters, illustrating how basic logic functions can be applied in real-world situations; many use VHDL to implement a system. Provides many examples with related problems. Includes ample illustrations throughout. A solid introduction to digital systems and programming in VHDL for design engineers or software engineers.

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Editorial Review

From the Back Cover

This text is an alternate version of *Digital Fundamentals,* the best-selling text which has been recognized as the authority on the fundamentals of digital electronics for nearly a quarter of a . century. If you have used Digital Fundamentals successfully but now need coverage of VHDL and PLDs coordinated with the basic logic fundamentals, this is the text for you, *Digital Fundamentals with VHDL* provides complete, up-to-date coverage from the basic digital logic concepts to the latest in digital signal processing. VHDL topics are introduced early and covered in many of the chapters so that the student can learn how to program PLDs with the logic functions covered in the chapter. In addition, Floyd's acclaimed emphases on *applications* and *troubleshooting* assist the reader in developing the critical problem-solving skills that are so necessary for working in the field.

This first edition of *Digital Fundamentals with VHDL* represents an exciting and unique approach to teaching digital fundamentals. The same widely acclaimed coverage of digital technology found in the *Digital Fundamentals* texts for the past quarter century continues to be the primary focus in this book. Programmable logic devices (PLDs) are presented as the predominate method of logic function implementation, but fixed-function logic device coverage is still retained for reference in the appendix with convenient references throughout the book.

VHDL is introduced as the hardware description language of choice for programming PLDs, and its coverage is closely coordinated with the logic functions covered in each chapter. There are VHDL sections in each chapter through Chapter 10, and Chapter 7 is devoted entirely to the topic. VHDL is treated as a means to the end rather than as the end itself, and new topics are introduced gradually as needed. This approach to VHDL allows the student to focus on the basic digital concepts and logic functions, which are of primary importance, without having to deal with the programming language until the basic topics of digital logic are mastered. Then the coverage of VHDL, which is closely related to the basic logic, is presented as a means of implementing the logic functions in PLDs. The student will learn the three basic VHDL approaches for the description of logic circuits and systems: the *structural approach,* which relates to the schematic of a logic circuit; the *data flow* approach, which relates to the Boolean description of a logic circuit; and the *behavioral* approach, which relates to the state diagram description of a logic circuit.

The lab manual that is available for this text provides practical experiences in the implementation of logic circuits and systems using VHDL. The experiments closely track the level and topics in this text.

Chapters on microprocessors and digital signal processing, as well as a chapter on integrated circuit technology, are included. The IC technology chapter (Chapter 14) can be used as a "floating" chapter or can be omitted entirely.

You will probably find more topics in this text than you can cover in a single course. This range of topics provides flexibility to accommodate a variety of program requirements. For example, some of the design-oriented or system application topics may not be appropriate in some courses. Other programs may not have time or their emphasis may not require them to cover microprocessors or digital signal processing. Further, some programs may not need the coverage of integrated circuit technology found in Chapter 14. These and

other topics can be omitted or covered lightly without affecting the coverage of the fundamental topics. A background in electronics is not a prerequisite for this textbook.

Major Content Features

- Basic digital concepts and logic function coverage is the primary focus of the text.
- Programmable logic devices, including CPLDs and FPGAs, are introduced beginning in Chapter 1 and covered in many chapters.
- VHDL is introduced and covered in support of the basic logic functions throughout the first ten chapters.
- Coverage of specific fixed-function logic devices is available in Appendix A with references at appropriate points throughout the text.
- Digital System Application features with VHDL applications are included at the end of many chapters.
- An entire chapter is devoted to microprocessors, including standard buses (Chapter 12).
- An entire chapter is devoted to digital signal processing (Chapter 13).

Pedagogical Features

- Full-color, reader-friendly format.
- Chapter outline, chapter objectives, introduction, essential term list, add digital system application preview (if applicable) in each chapter opener.
- Introduction and objectives at the beginning of each section in a chapter.
- Numerous worked examples, each with a related problem.
- Review questions at the end of each section in a chapter.
- Computer Notes interspersed throughout to provide interesting information about computer technology as it relates to the text coverage.
- Hands-On Tips interspersed throughout to provide useful and practical information.
- The terms in the Essential Terms list at the beginning of each chapter are highlighted in **boldface color** and defined at the end of the chapter as well as at the end of the book in the comprehensive glossary. Other glossary terms are in *italic*.
- EWB and Multisim circuit files on CD-ROM simulate many of the logic circuits that are illustrated in the text and provide troubleshooting practice at the end of.' each chapter.
- Margin notes provide condensed explanations or summaries of selected text material.
- Answer reminders tell the student where to find the answers to the various exercises and problems throughout each chapter.
- Chapter summaries pull together the key ideas in each chapter.
- Multiple-choice self-tests appear at the end of each chapter.
- Extensive sectionalized problem sets include basic problems, troubleshooting problems, VHDL problems, system application problems, and design problems.

Users Review

From reader reviews:

Daniel Gomez:

As people who live in the particular modest era should be up-date about what going on or info even knowledge to make these keep up with the era and that is always change and progress. Some of you maybe will certainly update themselves by studying books. It is a good choice for yourself but the problems coming to you actually is you don't know which you should start with. This Digital Fundamentals with VHDL is our recommendation so you keep up with the world. Why, because book serves what you want and want in this

era.

Tony Jacobson:

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