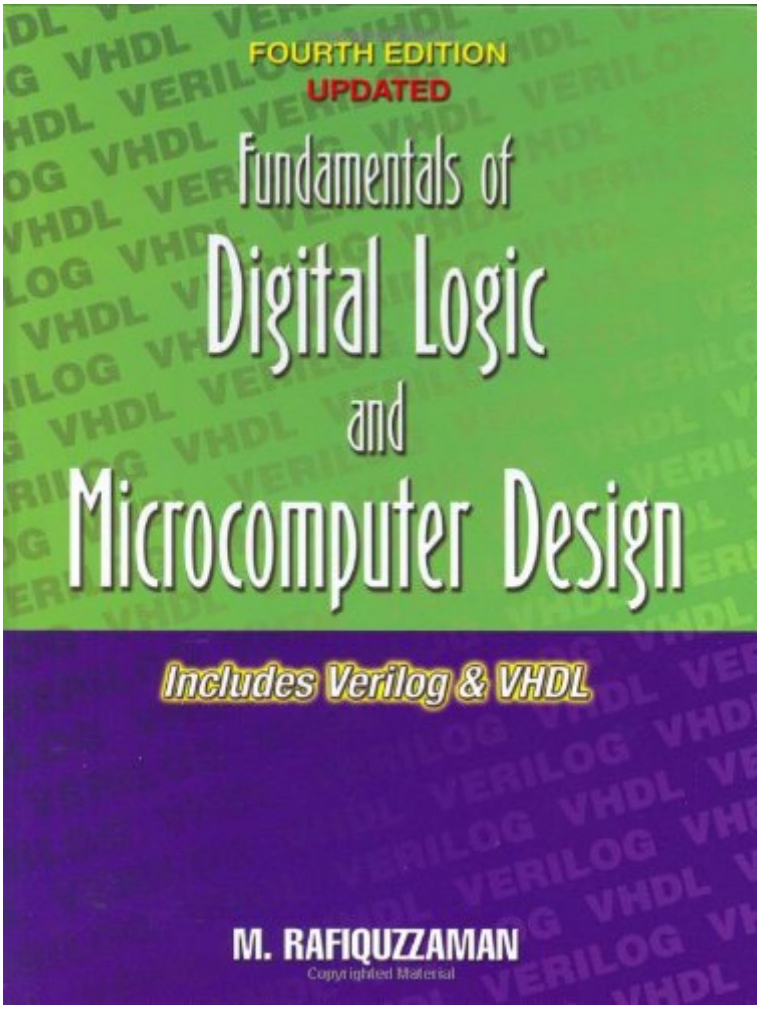
Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition PDF



Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition by M. Rafiquzzaman ISBN 0966498054
PREFACE

This book covers all basic concepts of computer engineering and science from digital logic circuits to the design of a complete microcomputer system in a systematic and simplified manner. It is written to present a clear understanding of the principles and basic tools required to design typical digital systems such as microcomputers.

The fourth edition of this book contains a detailed coverage of popular hardware description languages such as Verilog and VHDL. These two languages are included independent of each other in such a way that either Verilog or VHDL can be covered in a course without any confusion.

The material included in this book is divided into three sections. The first section contains Chapters 1 through 5. These chapters describe digital circuits at the gate and flip-flop levels and describe the analysis and design of combinational and sequential circuits. Verilog and VHDL are introduced in this section. The second section contains Chapters 6 through 8. These chapters describe microcomputer organization/architecture, programming, design of computer instruction sets, CPU, memory, and I/O. CPU design using Verilog and VHDL is included in this section. The third section contains Chapters 9 through 11. These chapters contain typical 16-, 32-, and 64-bit microprocessors manufactured by Intel and Motorola. Future plans of Intel and Motorola are also included. The details of the topics covered in eleven chapters of this book follow.

Chapter 1 presents an explanation of basic terminologies, fundamental concepts of digital integrated circuits using transistors, a comparison of LSTTL, HC, and HCT IC characteristics, the evolution of computers, and technological forecasts.

Chapter 2 provides various number systems and codes suitable for representing information in microprocessors.

Chapter 3 covers Boolean algebra along with map simplification of Boolean functions. The basic characteristics of digital logic gates are also presented.

Chapter 4 contains analysis and design of combinational circuits. Typical combinational circuits such as adders, decoders, encoders, multiplexers, and demultiplexers are included. Combinational logic design using Verilog and VHDL is also provided.

Chapter 5 covers various types of flip-flops. Analysis and design of sequential circuits such as counters are provided. Sequential logic design using Verilog and VHDL is included.

Chapter 6 presents typical microcomputer architecture, internal microprocessor organization, memory, I/O, and programming concepts. Design of a typical status register using Verilog and VHDL is included.

Chapter 7 contains the fundamentals of instruction set design. Design of registers and ALUs is presented. Furthermore, control unit design using both hardwired and microprogrammed approaches is included. Nanomemory concepts are covered. Finally, CPU design using both Verilog and VHDL is included.

Chapter 8 explains the basics of memory, I/O, and parallel processing. Topics such as main memory array design, memory management concepts, cache memory organization, and pipelining are included.

Chapters 9 and 10 contain detailed descriptions of the architectures, addressing modes, instruction sets, I/O, and system design concepts associated with Intel 8086 and Motorola MC68000.

Chapter 11 provides a summary of the basic features of Intel and Motorola 32- and 64-bit microprocessors. Overviews of the Intel 80486 / Pentium / Pentium Pro / Pentium II / Celeron / Pentium III, Pentium 4, and the Motorola 68030 / 68040 / 68060 / PowerPC (32- and 64-bit) microprocessors are included. Finally, future plans by both Intel and Motorola are discussed.

The book can be used in a number of ways. Because the materials presented are basic and do not require any advanced mathematical background, the book can easily be adopted as a text for three quarter or two semester courses. These courses can be taught at the undergraduate level in engineering and computer science. The recommended course sequence can be digital logic design in the first course, with topics that include selected portions from Chapters 1 through 5 , followed by a second course on computer architecture / organization (Chapters 6 through 8). The third course may include selected topics from Chapters 9 through 11, covering Intel and/or Motorola microprocessors.

The audience of this book can also be graduate students or practicing microprocessor system designers in the industry. Portions of Chapters 9 through 11 can be used as an introductory graduate text in electrical engineering or computer science. Practitioners of microprocessor system design in the industry will find simplified explanations along with examples and comparison considerations than are found in manufacturers manuals.

The author wishes to express his sincere appreciation to his students, Cindy Yeh, Vu Tran, King Lam, Luis Galdamez, Anthony Hernandez, Mario Martinez, Raul Velasquez, Adolph Huynh, Thien Ton, Elias Younes, Beniamin Petreaca, and to all others for making constructive suggestions. The author is indebted to his colleagues, Dr. R. Chandra, Dr. M. Davarpanah, Dr. T. Sacco, and Dr. S. Monemi of California State Poly University, Pomona for their valuable comments. The author is also grateful to Dr. W. C. Miller of University of Windsor, Canada and to his good friend, US Congressman Duke Cunningham (TOPGUN, Vietnam), for their inspiration during the writing effort. Finally, the author is especially indebted to his father and his deceased mother who were primarily responsible for the author's accomplishments.

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This Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition book is not really ordinary book, you have it then the world is in your hands. The benefit you get by reading this book is actually information inside this reserve incredible fresh, you will get information which is getting deeper an individual read a lot of information you will get. This kind of Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition without we recognize teach the one who looking at it become critical in imagining and analyzing. Don’t be worry Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition can bring any time you are and not make your tote space or bookshelves’ grow to be full because you can have it inside your lovely laptop even cell phone. This Fundamentals of Digital Logic and Microcomputer Design: Includes Verilog & VHDL -- Fourth Edition having great arrangement in word and layout, so you will not really feel uninterested in reading.