

Fundamentals Of Digital Logic Design Solutions

A COMPREHENSIVE GUIDE TO THE DESIGN & ORGANIZATION OF MODERN COMPUTING SYSTEMS Digital Logic Design and Computer Organization with Computer Architecture for Security provides practicing engineers and students with a clear understanding of computer hardware technologies. The fundamentals of digital logic design as well as the use of the Verilog hardware description language are discussed. The book covers computer organization and architecture, modern design concepts, and computer security through hardware. Techniques for designing both small and large combinational and sequential circuits are thoroughly explained. This detailed reference addresses memory technologies, CPU design and techniques to increase performance, microcomputer architecture, including "plug and play" device interface, and memory hierarchy. A chapter on security engineering methodology as it applies to computer architecture concludes the book. Sample problems, design examples, and detailed diagrams are provided throughout this practical resource. **COVERAGE INCLUDES:** Combinational circuits: small designs Combinational circuits: large designs Sequential circuits: core modules Sequential circuits: small designs Sequential circuits: large designs Memory Instruction set architecture Computer architecture: interconnection Memory system Computer architecture: security

Fundamentals of Digital Logic and Microcomputer Design, has long been hailed for its clear and simple presentation of the principles and basic tools required to design typical digital systems such as microcomputers. In this Fifth Edition, the author focuses on computer design at three levels: the device level, the logic level, and the system level. Basic topics are covered, such as number systems and Boolean algebra, combinational and sequential logic design, as well as more advanced subjects such as assembly language programming and microprocessor-based system design. Numerous examples are provided throughout the text. Coverage includes: Digital circuits at the gate and flip-flop levels Analysis and design of combinational and sequential circuits Microcomputer organization, architecture, and programming concepts Design of computer instruction sets, CPU, memory, and I/O System design features associated with popular microprocessors from Intel and Motorola Future plans in microprocessor development An instructor's manual, available upon request Additionally, the accompanying CD-ROM, contains step-by-step procedures for installing and using Altera Quartus II software, MASM 6.11 (8086), and 68asm (68000), provides valuable simulation results via screen shots. Fundamentals of Digital Logic and Microcomputer Design is an essential reference that will provide you with the fundamental tools you need to design typical digital systems.

This book provides a comprehensive, modern approach to the analysis and design of digital circuits and systems. It introduces digital design from basic concepts to advanced circuits and systems using both theoretical methods and CAD supported methods utilizing VHDL as a hardware description language. Friendly coverage also includes detailed digital design techniques, with a thorough discussion on state-machine modeling for the analysis and design of complex sequential systems using algorithmic state machine charts. Key features: Covers the analysis and design of combinational networks in depth; Presents complete coverage to the analysis and design of sequential networks; Places a strong emphasis on developing and using systematic procedures; Includes a thorough coverage to VHDL at the end of each chapter; Contains in-depth presentation of modern digital system design with PLDs; Includes techniques and heuristics for design reliability; Comprises numerous detailed examples throughout the text; Incorporates practical problems for the students/readers to carry out.

This text is intended for a first course in digital logic design, at the sophomore or junior level, for electrical engineering, computer engineering and computer science programs, as well as for a number of other disciplines such as physics and mathematics. The book can also be used for self-study or for review by practicing engineers and computer scientists not intimately familiar with the subject. After completing this text, the student should be prepared for a second (advanced) course in digital design, switching and automata theory, microprocessors or computer organization.

Hardware verification is the process of checking whether a design conforms to its specifications of functionality and timing. In today's design processes it becomes more and more important. Very large scale integrated (VLSI) circuits and the resulting digital systems have conquered a place in almost all areas of our life, even in security sensitive applications. Complex digital systems control airplanes, have been used in banks and on intensive-care units. Hence, the demand for error-free designs is more important than ever. In addition, economic reasons underline this demand as well. The design and production process of present day VLSI-circuits is highly time- and cost-intensive. Moreover, it is nearly impossible to repair integrated circuits. Thus, it is desirable to detect design errors early in the design process and not just after producing the prototype chip. All these facts are reflected by developing and production statistics of present day companies. For example, Intel Technologies [118] assumed that about 60% to 80% of the overall design time was spent for verification in 2000. Other sources cite the 3-to-1 head count ratio between verification engineers and logic designers. This shows that verifying logical correctness of the design of hardware systems is a major gate to the problem of time-to-market (cf. [113]). With the chip complexity constantly increasing, the difficulty as well as the importance of functional verification of new product designs has been increased. It is not only more important to get error-free designs.

A text developed from a previous work, An Introduction to Computer Logic (1974) by Nagle, Carroll, and Irwin, which was a widely adopted text on the fundamentals of combinational and sequential logic circuit analysis and synthesis. The present text retains its predecessor's strong coverage of fundamental theory. To address practical design issues, over half of the text is new material that reflects the many changes which have occurred in recent years, including modular design, CAD methods, and the use of programmable logic, as well as such practical issues as device timing characteristics and standard logic symbols. Annotation copyright by Book News, Inc., Portland, OR

Fundamentals of Digital Logic with VHDL Design teaches the basic design techniques for logic circuits. It emphasizes the synthesis of circuits and explains how circuits are implemented in real chips. Fundamental concepts are illustrated by using small examples, which are easy to understand. Then, a modular approach is used to show how larger circuits are designed. The book emphasizes CAD through the use of Altera's Quartus II CAD software, a state-of-the-art digital circuit design package. This software produces automatic mapping of designs written in VHDL into Field Programmable Gate Arrays).

Market_Desc: · Undergraduate courses on digital logic design, computer architecture, and microprocessors. · Graduate students and practicing microprocessor system designers in industry. Special Features: · While most texts either focus on computer design or digital logic and digital systems, this book includes both areas, making it a unique addition to existing literature. · The author has

an extensive background in computers and has published numerous books on the subject. He is undoubtedly one of the leading authorities in this field. This book covers simple topics, such as number system and Boolean algebra, to advanced topics, such as assembly language programming and microprocessor-based system design. The accompanying CD contains a step by step procedure for installing and using Altera Quartus II software for synthesizing Verilog and VHDL descriptions. Screen shots of the waveforms and tabular forms illustrating the simulation results are also provided in the CD. The CD also contains a step by step procedure for installing and using MASM 6.11 (8086) and 68asmsim (68000). Screen shots verifying correct operations of several assembly language programs via simulation using test data are also provided in the CD. About The Book: 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 methodical and basic manner. Its intention is to present a clear understanding of the principles and basic tools required to design typical digital systems such as microcomputers. The book covers the latest version of Altera software called Quartus II. It provides a simplified introduction to VHDL along with a step by step procedure with tutorials on a CD. It is ideal for an introductory course in VHDL, containing digital logic and microprocessors along with both VHDL and Verilog. The material in the text is divided into three sections: Fundamentals of digital logic circuits and design. Microprocessor/microcomputer design. Overview of 16-, 32-, and 64-bit microprocessors manufactured by Intel and Motorola.

Hardware -- Logic Design.

Fundamentals of Digital Logic With Verilog Design is intended for an introductory course in digital logic design. The main goals are (1) to teach students the fundamental concepts in classical manual digital design, and (2) illustrate clearly the way in which digital circuits are designed today, using CAD tools. Use of CAD software is well integrated into the book. Some excellent CAD tools are available free of charge. For example, the Altera Corporation has its Quartus II CAD software, used for implementing designs in programmable logic devices such as FPGAs. The Web Edition of the Quartus II software can be downloaded from Altera's website and used free of charge, without the need to obtain a license. Previous editions of this book a set of tutorials for using Quartus II software was provided in the appendices. These tutorials can now be found on the Author's website. Another set of useful tutorials about Quartus II can be found on Altera's University Program website, which is located at www.altera.com/education/univ For courses in digital circuits, digital systems (including design and analysis), digital fundamentals, digital logic, and introduction to computers Digital Fundamentals, Eleventh Edition, continues its long and respected tradition of offering students a strong foundation in the core fundamentals of digital technology, providing basic concepts reinforced by plentiful illustrations, examples, exercises, and applications. The text's teaching and learning resources include an Instructor's Manual, PowerPoint lecture slides, and Test Bank, as well as study resources for students. Teaching and Learning Experience: Provides a strong foundation in the core fundamentals of digital technology. Covers basic concepts reinforced by plentiful illustrations, examples, exercises, and applications. Offers a full-color design, effective chapter organization, and clear writing that help students grasp complex concepts. The Fourth edition of this well-received text continues to provide coherent and comprehensive coverage of digital circuits. It is designed for the undergraduate students pursuing courses in areas of engineering disciplines such as Electrical and Electronics, Electronics and Communication, Electronics and Instrumentation, Telecommunications, Medical Electronics, Computer Science and Engineering, Electronics, and Computers and Information Technology. It is also useful as a text for MCA, M.Sc. (Electronics) and M.Sc. (Computer Science) students. Appropriate for self study, the book is useful even for AMIE and grad IETE students. Written in a student-friendly style, the book provides an excellent introduction to digital concepts and basic design techniques of digital circuits. It discusses Boolean algebra concepts and their application to digital circuitry, and elaborates on both combinational and sequential circuits. It provides numerous fully worked-out, laboratory tested examples to give students a solid grounding in the related design concepts. It includes a number of short questions with answers, review questions, fill in the blanks with answers, multiple choice questions with answers and exercise problems at the end of each chapter.

Intended for an introductory course in digital logic design. The authors provide a balance between classical and modern design approaches. Basic concepts are introduced using simple log circuits, which are designed by using both manual techniques and modern CAD-tool-based methods.

Updated with modern coverage, a streamlined presentation, and excellent companion software, this seventh edition of FUNDAMENTALS OF LOGIC DESIGN achieves yet again an unmatched balance between theory and application. Authors Charles H. Roth, Jr. and Larry L. Kinney carefully present the theory that is necessary for understanding the fundamental concepts of logic design while not overwhelming students with the mathematics of switching theory. Divided into 20 easy-to-grasp study units, the book covers such fundamental concepts as Boolean algebra, logic gates design, flip-flops, and state machines. By combining flip-flops with networks of logic gates, students will learn to design counters, adders, sequence detectors, and simple digital systems. After covering the basics, this text presents modern design techniques using programmable logic devices and the VHDL hardware description language.

This book provides analysis and design of digital circuits and systems. It introduces digital design from basic concepts to advanced circuits and systems using both theoretical and CAD supported methods. The book gives an introduction to VHDL throughout with a large number of examples and case studies. Key features Covers the analysis and design of combinational networks using Boolean algebra and K-maps Presents complete coverage to the analysis and design of sequential networks Places a strong emphasis on developing and using systematic procedures Includes a thorough coverage to VHDL at the end of each chapter Contains in-depth presentation of modern digital system design using programmable-logic devices Comprises detailed solved examples in every chapter Incorporates practical problems for the students/readers to carry out

Fundamentals of Digital Logic and Microcomputer Design, has long been hailed for its clear and simple presentation of the principles and basic tools required to design typical digital systems such as microcomputers. In this Fifth Edition, the author focuses on computer design at three levels: the device level, the logic level, and the system level. Basic topics are covered, such as number systems and Boolean algebra, combinational and sequential logic design, as well as more advanced subjects such as assembly language programming and microprocessor-based system design. Numerous examples are provided throughout the text. Coverage includes: Digital circuits at the gate and flip-flop levels Analysis and design of combinational and sequential circuits Microcomputer organization, architecture, and programming concepts Design of computer instruction sets, CPU, memory, and I/O System design features associated with popular microprocessors from Intel and Motorola Future plans in microprocessor development An instructor's manual, available upon request Additionally, the accompanying CD-ROM, contains step-by-step procedures for installing and using Altera Quartus II software, MASM 6.11 (8086), and 68asmsim (68000), provides valuable simulation results via screen shots. Fundamentals of Digital Logic and Microcomputer Design is an essential reference that will provide you with the fundamental tools you need to design typical digital systems.

Fundamentals of Digital Logic with Verilog Design is intended for an introductory course in digital logic design, which is a basic course in most Electrical and Computer Engineering programs. The authors provide a desirable balance between classical and modern design approaches.

Basic concepts are introduced using simple logic circuits, which are designed by using both manual techniques and modern CAD-tool-based methods. Having established the fundamental concepts, more complex, realistic circuits are then designed with the CAD tools.

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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.

Based on the book Computer Engineering Hardware Design (1988), which presented the same combined treatment of logic design, digital system design and computer design basics. Because of its broad coverage of both logic and computer design, this text can be used to provide an overview of logic and computer hardware for computer science, computer engineering, electrical engineering, or engineering students in general. Annotation copyright by Book News, Inc., Portland, OR.

Fundamentals of Digital Logic With Verilog Design teaches the basic design techniques for logic circuits. It emphasizes the synthesis of circuits and explains how circuits are implemented in real chips. Fundamental concepts are illustrated by using small examples. Use of CAD software is well integrated into the book. A CD-ROM that contains Altera's Quartus CAD software comes free with every copy of the text. The CAD software provides automatic mapping of a design written in Verilog into Field Programmable Gate Arrays (FPGAs) and Complex Programmable Logic Devices (CPLDs). Students will be able to try, firsthand, the book's Verilog examples (over 140) and homework problems. Engineers use Quartus CAD for designing, simulating, testing and implementing logic circuits. The version included with this text supports all major features of the commercial product and comes with a compiler for the IEEE standard Verilog language. Students will be able to: enter a design into the CAD system compile the design into a selected device simulate the functionality and timing of the resulting circuit implement the designs in actual devices (using the school's laboratory facilities) Verilog is a complex language, so it is introduced gradually in the book. Each Verilog feature is presented as it becomes pertinent for the circuits being discussed. To teach the student to use the Quartus CAD, the book includes three tutorials. Digital Logic with an Introduction to Verilog and FPGA-Based Design provides basic knowledge of field programmable gate array (FPGA) design and implementation using Verilog, a hardware description language (HDL) commonly used in the design and verification of digital circuits. Emphasizing fundamental principles, this student-friendly textbook is an ideal resource for introductory digital logic courses. Chapters offer clear explanations of key concepts and step-by-step procedures that illustrate the real-world application of FPGA-based design. Designed for beginning students familiar with DC circuits and the C programming language, the text begins by describing of basic terminologies and essential concepts of digital integrated circuits using transistors. Subsequent chapters cover device level and logic level design in detail, including combinational and sequential circuits used in the design of microcontrollers and microprocessors. Topics include Boolean algebra and functions, analysis and design of sequential circuits using logic gates, FPGA-based implementation using CAD software tools, and combinational logic design using various HDLs with focus on Verilog. Fundamentals of Digital Logic with Verilog Design McGraw-Hill Education

The perfect complement to computer architecture and logic texts. This widely praised tutorial and lab book gives practice in the fundamentals of digital logic and circuitry, with special emphasis on how the machine operates at the gate and register level. Presentation employs the TTL family of digital logic due to its wide availability and moderate cost. Exercises require the student to perform a simple designs and then implement them on hardware. Contains sufficient exercises for a 3-hour lab meeting, once a week, for a semester.

Updated with modern coverage, a streamlined presentation, and excellent companion software, this seventh edition of FUNDAMENTALS OF LOGIC DESIGN achieves yet again an unmatched balance between theory and application. Authors Charles H. Roth, Jr. and Larry L. Kinney carefully present the theory that is necessary for understanding the fundamental concepts of logic design while not overwhelming students with the mathematics of switching theory. Divided into 20 easy-to-grasp study units, the book covers such fundamental concepts as Boolean algebra, logic gates design, flip-flops, and state machines. By combining flip-flops with networks of logic gates, students will learn to design counters, adders, sequence detectors, and simple digital systems. After covering the basics, this text presents modern design techniques using programmable logic devices and the VHDL hardware description language. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Digital Logic Design, Second Edition provides a basic understanding of digital logic design with emphasis on the two alternative methods of design available to the digital engineer. This book describes the digital design techniques, which have become increasingly important. Organized into 14 chapters, this edition begins with an overview of the essential laws of Boolean algebra, K-map plotting techniques, as well as the simplification of Boolean functions. This text then presents the properties and develops the characteristic equations of a number of various types of flip-flop. Other chapters consider the design of synchronous and asynchronous counters using either discrete flip-flops or shift registers. This book discusses as well the design and implementation of event driven logic circuits using the NAND sequential equation. The final chapter deals with simple coding techniques and the principles of error detection and correction. This book is a valuable resource for undergraduate students, digital engineers, and

scientists.

Updated to reflect the latest advances in the field, the Sixth Edition of Fundamentals of Digital Logic and Microcontrollers further enhances its reputation as the most accessible introduction to the basic principles and tools required in the design of digital systems. Features updates and revision to more than half of the material from the previous edition Offers an all-encompassing focus on the areas of computer design, digital logic, and digital systems, unlike other texts in the marketplace Written with clear and concise explanations of fundamental topics such as number system and Boolean algebra, and simplified examples and tutorials utilizing the PIC18F4321 microcontroller Covers an enhanced version of both combinational and sequential logic design, basics of computer organization, and microcontrollers

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