Digital System Design And Microprocessors Mcgraw Hill Series In Computer Organization And Architecture

DIGITAL LOGIC AND MICROPROCESSOR DESIGN WITH INTERFACING. 2E provides a solid foundation for designing digital logic circuits. This unique approach combines the use of logic principles and the building of individual components to create data paths and control units so readers can build dedicated custom microprocessors and general-purpose microprocessors. Readers design simple microprocessors from the ground up, implement them in real hardware, and interface them to actual devices. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The text for a one-semester course in Digital Systems Design describes the basic methods used to develop "traditional" Digital Systems, based on the use of logic gates and flip flops, as well as more advanced techniques that enable the design of very large circuits, based on Hardware Description Languages and Synthesis tools. It was originally designed to accompany a MOOC (Massive Open Online Course) created at the Autonomous University of Barcelona (UAB), currently available on the Coursera platform. Readers will learn what a digital system is and how it can be developed, preparing them for steps toward other technical disciplines, such as Computer Architecture, Robotics, Bionics, Avionics and others. In particular, students will learn to design digital systems of medium complexity, describe digital systems using high level hardware description languages, and understand the operation of computers at their most basic level. All concepts introduced are reinforced by plentiful illustrations, examples, exercises, and applications. For example, as an applied example of the design techniques presented, the authors demonstrate the synthesis of a simple processor, leaving the student in a position to enter the world of Computer Architecture and Embedded Systems.

Practical Design of Digital Circuits: Basic Logic to Microprocessors demonstrates the practical aspects of digital circuit design. The intention is to give the reader sufficient confidence to embark upon his own design projects utilizing digital integrated circuits as soon as possible. The book is organized into three parts. Part 1 teaches the basic principles of practical design, and introduces the designer to his "tools" — or rather, the range of devices that can be called upon. Part 2 shows the designer how to put these together into viable designs. It includes two detailed descriptions of actual design exercises. The first of these is a fairly simple exercise in CMOS design; the second is a much more complex design for an electronic game, using TTL devices. Part 3 focuses on microprocessors. It illustrates how a particular design problem changes emphasis when a microprocessor is introduced. This book is aimed at a fairly broad market: it is intended to aid the linear design engineer to cross the barrier into digital electronics; it should provide interesting supporting reading for students studying digital electronics from the more academic viewpoint; and it should enable the enthusiast to design much more ambitious and sophisticated projects than he could otherwise attempt if restricted to linear devices.

Digital Design and Computer Architecture: ARM Edition covers the fundamentals of digital logic design and reinforces logic concepts through the design of an ARM microprocessor. Combining an engaging and humorous writing style with an updated and hands-on approach to digital design, this book takes the reader from the fundamentals of digital logic to the actual design of an ARM processor. By the end of this book, readers will be able to build their own microprocessor and will have a top-to-bottom understanding of how it works. Beginning with digital logic gates and progressing to the design of combinational and sequential circuits, this book uses these fundamental building blocks as the basis for designing an ARM processor. SystemVerilog and VHDL are integrated throughout the text in examples illustrating the methods and techniques for CAD-based circuit design. The companion website includes a chapter on I/O systems with practical examples that show how to use the Raspberry Pi computer to communicate with digital and analog devices, including microcontrollers, and with peripheral devices such as LCDs, Bluetooth radios, and motors. The Companion website also includes appendices covering practical digital design issues and C programming as well as links to CAD tools, lecture slides, laboratory projects, and solutions to exercises.

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 through 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.

This book has been designed to meet the needs of students of electronic engineering, computer science and physics. It will also be useful to engineers and scientists who did not have the opportunity to study digital techniques and microprocessors in their college days. The book can be used for self study, practice and as a guide to what can be expected in the examination. The book consists of 12 chapters and 8 appendices. Each chapter contains: Solved problems (330 in the book) Unsolved problems with answers (320 in the book) Questions with Answers (450 in the book) There is separate sections containing 465 multiple choice questions (with answers) covering all the topics. Readers will find the exhaustive glossary of over 500 terms very useful. Hardware -- Integrated Circuits.

Briefly traces the history of computers and microprocessors, and discusses basic logic gates, programmable logic devices, Boolean algebra, combinational logic, sequential logic, computer memory, and 8086 instruction sets.

In recent years Digital Electronics & Microprocessor is being used extensively in computers, microprocessor and very large scale integration (VLSI) design and digital signal processing.
research and many other things. This rapid progress in Electronics Engineering has created an increasing demand for trained Digital System Designs personnel. This book is intended for the undergraduate and postgraduate students specializing in Electronics Engineering, Computer Science Engineering and Information Technology. It will also serve as reference material for engineers employed in industry. The fundamental concepts and principles behind Digital Electronics & Microprocessor are explained in a simple, easy-to-understand manner. Each chapter contains a large number of solved example or problem which will help the students in problem solving and designing of Electronics system. This text book is organized into Thirteen chapters.

Chapter 1: Number Systems and Boolean Algebra
Chapter 2: Combinational Circuits
Chapter 3: Sequential Circuits
Chapter 4: Digital Logic Families
Chapter 5: Memory & Programmable Logic
Chapter 6: Asynchronous Sequential Logic
Chapter 7: Digital System Design Using Hardware
Chapter 8: Digital System Design Using VHDL
Chapter 9: Design of Fast Adder
Chapter 10: Design of Fast Multiplier
Chapter 11: Basics of Microprocessor
Chapter 12: Progaming of Microprocessor
Chapter 13: Micro Controller & Its Applications

The book Digital Electronics & Microprocessor is written to cater to the needs of the undergraduate courses in the discipline of Electronics & Communication Engineering, Computer Science Engineering, Information Technology, Electronics & Instrumentation Engineering, Electrical & Electronics Engineering and postgraduate students specializing in Electronics. It will also serve as reference material for engineers employed in industry. The fundamental concepts and principles behind Digital Electronics & Microprocessor are explained in a simple, easy-to-understand manner. Digital Electronics & Microprocessor also gives the possible experiments of digital logic design using VHDL and Hardware that can be done by students of B.E. /B.Tech. /M.Tech. and Ph.D. level.

Salient Features:
- Detailed coverage of Number Systems and Boolean Algebra, Combinational Circuits and Sequential Circuits
- Comprehensive chapters on Digital Logic Families, Memory & Programmable Logic and Asynchronous Sequential Logic
- Detailed coverage of Digital System Design Using Hardware, Digital System Design Using VHDL, Design of Fast Adder and Design of Fast Multiplier
- Comprehensive chapters on Basics of Microprocessor, Progaming of Microprocessor, Microcontroller and Its Application

Each chapter contains a large number of solved example or objective type's problem which will help the students in problem solving and designing of digital system. Clear perception of the various problems with a large number of neat, well drawn and illustrative diagrams.

Simple Language, easy-to-understand manner. I do hope that the text book in the present form will meet the requirement of the students doing graduation in Electronics & Communication Engineering, Computer Science Engineering, Information Technology, Electronics & Instrumentation Engineering and Electrical & Electronics Engineering. I shall appreciate any suggestions from students and faculty members alike so that we can strive to make the text book more useful in the edition to come.

The use of the microprocessor as a building block for digital logic design is included in this complete introduction to computer engineering. The authors offer a top-down approach to designing digital systems, with consideration of both hardware and software. They emphasize structured design throughout, and the design methods, techniques, and notations are consistent with this theme. The first part of the book lays the foundation for structured design techniques; the second part provides the fundamentals of microprocessor and up-based design. Topics covered include mixed logic notation, the algorithm state machine, and structured programming techniques with well-documented programs. An abundance of examples and end-of-chapter problems are included.

Microprocessor System Design: A Practical Introduction describes the concepts and techniques incorporated into the design of electronic circuits, particularly microprocessor boards and their peripherals. The book reviews the basic building blocks of the electronic systems composed of digital (logic levels, gate output circuitry) and analog components (resistors, capacitors, diodes, transistors). The text also describes operational amplifiers (op-amp) that use a negative feedback technique to improve the parameters of the op-amp. The design engineer can use programmable array logic (PAL) to replace standard discrete TTL and CMOS gates in circuits. The PAL is programmable and configurable to match the requirement of a given circuit. Using PAL can save space, a very important factor in the miniaturization process. Examples of PAL applications include the BCD counter, the LS 138 emulator, and a priority interrupt encoder. The book also explains the operation and function of a microprocessor, the bus-based systems, analog-to-digital conversion, and vice-versa. The text is suitable for programmers, computer engineers, computer technicians, and computer instructors dealing with many aspects of computers such as programming, networking, engineering or design.

This complete introduction to computer engineering includes the use of the microprocessor as a building block for digital logic design. The authors offer a top-down approach to designing digital systems, with consideration of both hardware and software. They emphasize structured design throughout, and the design methods, techniques, and notations are consistent with this theme. The first part of the book lays the foundation for structured design techniques; the second part provides the fundamentals of microprocessor and up-based design. Topics covered include mixed logic notation, the algorithm state machine, and structured programming techniques with well-documented programs. Contains an abundance of examples and end-of-chapter problems.

Digital System Design and Microprocessors McGraw-Hill Companies

The second edition of this work introduces the fundamental topics of digital system design. Divided into three parts, it covers logic design (into which a new section on ANSI/IEEE floating point standard has been included), the components of a microprocessor system and more extended aspects of digital system design. A major new chapter on VLSI system design and testing by Rafic Makki is included.

New, updated and expanded topics in the fourth edition include: EBCDIC, Grey code, practical applications of flip-flops, linear and shaft encoders, memory elements and FPGAs. The section on fault-finding has been expanded. A new chapter is dedicated to the interface between digital components and analog voltages. A highly accessible, comprehensive and fully up to date digital systems text *A well known and respected text now revamped for current courses *Part of the Newnes suite of texts for HND/1st year modules

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 is also 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. Request Inspection Copy

This book is designed to serve as a hands-on professional reference with additional utility as a textbook for upper undergraduate and some graduate courses in digital logic design. This book is organized in
such a way that that it can describe a number of RTL design scenarios, from simple to complex. The book constructs the logic design story from the fundamentals of logic design to advanced RTL design concepts. Keeping in view the importance of miniaturization today, the book gives practical information on the issues with ASIC RTL design and how to overcome those concerns. It clearly explains how to write an efficient RTL code and how to improve design performance. The book also describes advanced RTL design concepts such as low-power design, multiple clock-domain design, and SOC-based design. The practical orientation of the book makes it ideal for training programs for practicing design engineers and for short-term vocational programs. The contents of the book will also make it a useful read for students and hobbyists.

A General Guide on Logic Design. The Book Expands upon the Applications of Logic Design in Relation to Microprocessors

Embedded systems are today, widely deployed in just about every piece of machinery from toasters to spacecraft. Embedded system designers face many challenges. They are asked to produce increasingly complex systems using the latest technologies, but these technologies are changing faster than ever. They are asked to produce better quality designs with a shorter time-to-market. They are asked to implement increasingly complex functionality but more importantly to satisfy numerous other constraints. To achieve the current goals of design, the designer must be aware of such design constraints and more importantly, the factors that have a direct effect on them. One of the challenges facing embedded system designers is the selection of the optimum processor for the application in hand; single-purpose, general-purpose or application specific. Microcontrollers are one member of the family of the application specific processors. The book concentrates on the use of microcontroller as the embedded system's processor, and how to use it in many embedded system applications. The book covers both the hardware and software aspects needed to design field using microcontroller. The book is ideal for undergraduate students and also the engineers that are working in the field of digital system design.

Field-programmable logic has been available for a number of years. The role of Field-Programmable Logic Devices (FPLDs) has evolved from simply implementing the system ‘glue-logic’ to the ability to implement entire systems on a single chip. The FPLDs provide a method of prototyping complex digital systems to be used in the design of microprocessors. The speed with which these devices can be programmed makes them ideal for prototyping. Low production cost makes them competitive for small to medium volume productions. These devices make possible new sophisticated applications, and bring up new hardware/software trade-offs and diminish the traditional hardware/software demarcation line. Advanced design tools are being developed for automatic compilation of complex designs and routings to custom circuits. Digital Systems Design and Prototyping Using Field Programmable Logic covers the subjects of digital systems design and (FPLDs), combining them into an entity useful for designers in the areas of digital systems and rapid system prototyping. It is also useful for the growing community of engineers and researchers dealing with the exciting field of FPLDs, reconfigurable and programmable logic. The authors’ goal is to bring these topics to students studying digital system design, computer design, and related subjects in order to show them how very complex circuits can be implemented at the desk. Digital Systems Design and Prototyping Using Field Programmable Logic makes a pioneering effort to present rapid prototyping and generation of computer systems using FPLDs. From the Foreword: ‘This is a ground-breaking book that bridges the gap between design and understanding. It presents unified thinking to describing FPLDs technology. In addition to introducing the technology it also describes the design methodology and tools required to harness this technology. It introduces two hardware programming languages (e.g. AHDL and VHDL). Design is best learned by practice and the book supports this notion with abundant case studies.’ Daniel P. Siewiorek, Carnegie Mellon University CD-ROM INCLUDED! Digital Systems Design and Prototyping Using Field Programmable Logic, First Edition includes a CD-ROM that contains Altera’s MAX+PLUS II 7.21 Student Edition Programmable Logic Development Software. MAX+PLUS II is a fully integrated design environment that offers unmatched flexibility and performance. The intuitive graphical interface is complemented by complete and instantly accessible on-line documentation, which makes learning and using MAX+PLUS II quick and easy. The MAX+PLUS II version 7.21 Student Edition offers the following features: Operates on PCs running Windows 3.1, Windows 95 and Windows NT 3.51 and 4.0. Graphical and text-based design entry, including the Altera Hardware Description Language (AHDL) and VHDL. Design compilation for Product-term (MAX 7000S) and look-up table (FLEX 10K) device architectures. Design verification with full timing simulation. Learn FileMaker® Pro 10 provides an excellent introduction to the FileMaker Inc.'s award-winning database program for both beginners and advanced developers. From converting files created with previous versions of FileMaker Pro and sharing data on the web to creating reports and sorting data, this book offers a hands-on approach to getting the most out of your FileMaker Pro databases. Learn how to use the completely redesigned Status area, now known as the Status toolbar; send e-mail right from FileMaker with the SMTP-based Send Mail option; build reports quickly and easily with the Saved Finds feature; automate your database with scripts and activate those scripts with the new script trigger feature; integrate your Bento data into your FileMaker files; work with the enhanced Web viewer. An introductory text to computer architecture, this comprehensive volume covers the concepts from logic gates to advanced computer architecture. It comes with a full spectrum of exercises and web-downloadable support materials, including assembler and simulator, which can be used in the context of different courses. The authors also make available a hardware description, which can be used in labs and assignments, for hands-on experimentation with an actual, simple processor. This unique compendium is a useful reference for undergraduates, graduates and professionals majoring in computer engineering, circuits and systems, software engineering, biomedical engineering and aerospace engineering. Calculation is the main function of a computer. The central computer is responsible for executing the programs. The operation of the computer is integrated form. This component, since the announcement of its marketing in 1971, has not stopped breaking records in terms of computing power, price reduction and integration of functions (calculation of basic functions, storage with integrated controllers). It is present today in most electronic devices. Knowing its internal mechanisms and programming is essential for the electronics engineer and computer scientist to understand and master the operation of a computer and advanced concepts of programming. This first volume focuses more particularly on the first generations of microprocessors, that is to say those that handle integers in 4 and 8-bit formats. This chapter presents the calculation function and reminds the memory function. The following is devoted to notions of calculation model and architecture. The concept of bus is then presented. Chapters 4 and 5 can then address the internal organization and operation of the microprocessor. The mechanism of the function call, conventional and interrupted, is more particularly detailed in a separate chapter. The book ends with a presentation of architectures of the first microcomputers for a historical perspective. The knowledge is presented in the most exhaustive way possible with examples drawn from current and old technologies that illustrate and make accessible the theoretical concepts. Each chapter ends if necessary with corrected exercises and a bibliography. The list of acronyms used and an index are at the end of the book.

Digital Systems Design and Prototyping: Using Field Programmable Logic and Hardware Description Languages, Second Edition covers the subject of digital systems design using two important technologies: Field Programmable Logic Devices (FPLDs) and Hardware Description Languages (HDLs). These two technologies are combined to aid in the design, prototyping, and implementation of a whole range of digital systems from very simple ones replacing traditional glue logic to very complex ones customized as the requirement arise. The main HDLs are presented: VHDL and Verilog, the widely used standard languages, and the proprietary Altera HDL (AHDL). The chapters on these
developing digital systems, Digital System Design using FSMs: A Practical Learning Approach will also earn a place in the libraries of undergraduate and graduate electrical and electronic engineering students and researchers.

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.

This textbook for courses in Embedded Systems introduces students to necessary concepts, through a hands-on approach. It gives a great introduction to FPGA-based microprocessor system design using state-of-the-art boards, tools, and microprocessors from Altera/Intel® and Xilinx®. HDL-based designs (soft-core), parameterized cores (Nios II and MicroBlaze), and ARM Cortex-A9 design are discussed, compared and explored using many hand-on designs projects. Custom IP for HDMI coder, Floating-point operations, and FFT bit-swap are developed, implemented, tested and speed-up is measured. Downloadable files include all design examples such as basic processor synthesizable code for Xilinx and Altera tools for PicoBlaze, MicroBlaze, Nios II and ARMv7 architectures in VHDL and Verilog code, as well as the custom IP projects. Each Chapter has a substantial number of short quiz questions, exercises, and challenging projects. Explains soft, parameterized, and hard core systems design tradeoffs; Demonstrates design of popular KCPSM6 8 Bit microprocessor step-by-step; Discusses the 32 Bit ARM Cortex-A9 and a basic processor is synthesized; Covers design flows for both FPGA Market leaders Nios II Altera/Intel and MicroBlaze Xilinx system; Describes Compiler-Compiler Tool development; Includes a substantial number of Homework's and FPGA exercises and design projects in each chapter.

Focusing on the must know essentials, this textbook is designed for one-semester consolidated courses in digital and microprocessor fundamentals, or one-semester courses in digital fundamentals followed by one-semester courses in microprocessor fundamentals.

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.

This book will teach students how to design digital logic circuits, specifically combinational and sequential circuits. Students will learn how to put these two types of circuits together to form dedicated and general-purpose microprocessors. This book is unique in that it combines the use of logic principles and the building of individual components to create data paths and control units, and finally the building of real dedicated custom microprocessors and general-purpose microprocessors. After understanding the material in the book, students will be able to design simple microprocessors and implement them in real hardware.

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