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19NX7E - JONAS LACI

This Second Edition provides all the required information for a course in modern device electronics taken by undergraduate electrical engineers. Offers major new coverage of silicon technology, adds several topics in basic semiconductor physics not treated previously, and introduces Hall-effect sensors. The chapters on MOSFET have been entirely updated, focusing on mobility variations and threshold-voltage dependence. Additional topics include VLSI devices, short channel effects, and computer modeling. **CMOS**, **CMOS**, **MOS**.

Designers of high-speed integrated circuits face a bewildering array of choices and too often spend frustrating days tweaking gates to meet speed targets. Logical Effort: Designing Fast CMOS Circuits makes high speed design easier and more methodical, providing a simple and broadly applicable method for estimating the delay resulting from factors such as topology, capacitance, and gate sizes. The brainchild of circuit and computer graphics pioneers Ivan Sutherland and Bob Sproull, "logical effort" will change the way you approach design challenges. This book begins by equipping you with a sound understanding of the method's essential procedures and concepts-so you can start using it immediately. Later chapters explore the theory and finer points of the method and detail its specialized applications. Features Explains the method and how to apply it in two practically focused chapters. Improves circuit design intuition by teaching simple ways to discern the consequences of topology and gate size decisions. Offers easy ways to choose the fastest circuit from among an array of potential circuit designs. Reduces the time spent on tweaking and simulations-so you can rapidly settle on a good design. Offers in-depth coverage of specialized areas of application for logical effort: skewed or unbalanced gates, other circuit families (including pseudo-NMOS and domino), wide structures such as decoders, and irregularly forking circuits. Presents a complete derivation of the method-so you see how and why it works.

Although there have been numerous books on wavelet applications to various scientific disciplines, this cutting-edge, practical book is the first to concentrate on wavelet applications to remote sensing and subsurface sensing from an engineer's point of view. The book introduces you to wavelet transform uses in a wide range of sensing technologies, demonstrates the usefulness of combining the wavelet transform with other signal processing tools to solve complicated sensing technology problems, and features several time-saving algorithms and Matlab® codes that help you with your specific projects in the field.

Graduate-level text provides strong background in more abstract areas of dynamical theory. Hamilton's equations, d'Alembert's principle, Hamilton-Jacobi theory, other topics. Problems and references. 1977 edition.

A clear exposition of the dynamics of mechanical systems from

an engineering perspective.

As with the first edition of CMOS: Circuit Design, Layout, and Simulation, the book provides an important contemporary view of a wide range of analog/digital circuit blocks, the BSIM model, data converter architectures, and much more. Offers comprehensive coverage of digital CMOS circuit design, as well as addressing technology issues highlighted by the widespread use of nanometer-scale CMOS technologies. Considerable attention from the international scientific community is currently focused on the wide ranging applications of wavelets. For the first time, the field's leading experts have come together to produce a complete guide to wavelet transform applications in medicine and biology. Wavelets in Medicine and Biology provides accessible, detailed, and comprehensive guidelines for all those interested in learning about wavelets and their applications to biomedical problems.

This collection of independent case studies demonstrates how wavelet techniques have been used to solve open problems and develop insight into the nature of the systems under study. Each case begins with a description of the problem and points to the specific properties of wavelets and techniques used for determining a solution. The cases range from a very simple wavelet-based technique for reducing noise in laboratory data to complex work on two-dimensional geographical data display conducted at the Earthquake Research Institute in Japan. One case study shows how wavelet analysis is used in the development of a Japanese text-to-speech system for personal computers and another presents new wavelet techniques developed for and applied to the study of atmospheric wind, turbulent fluid, and seismic acceleration data. Although calculus and some junior and senior mathematics courses for scientists and engineers will suffice, a solid background in undergraduate mathematics, particularly analysis and numerical analysis, and some familiarity with the basics of wavelets are helpful for reading this book.

CMOS Digital Integrated Circuits: Analysis and Design continues the well-established tradition of the earlier editions by offering the most comprehensive coverage of digital CMOS circuit design, as well as addressing state-of-the-art technology issues highlighted by the widespread use of nanometer-scale CMOS technologies. In this latest edition, virtually, all chapters have been rewritten - the transistor model equations and device parameters have been revised to reflect the significant changes that must be taken into account for new technology generations, and the material has been reinforced with up-to-date examples. The broad-ranging coverage of this textbook starts with the fundamentals of CMOS process technology, and continues with MOS transistor models, basic CMOS gates, interconnect effects, dynamic circuits, memory circuits, arithmetic building blocks, clock and I/O circuits, low-power design techniques, design for manufacturability, and design for testability.

Filled with worked examples and over 200 illustrations; this edi-

tion offers a clear; state-of-the-art presentation of all satellite communications topics such as orbits and launching methods; polarization; FDMA; TDMA; and CDMA; and much more. --

Franco's "Design with Operational Amplifiers and Analog Integrated Circuits, 3e" is intended for a design-oriented course in applications with operational amplifiers and analog ICs. It also serves as a comprehensive reference for practicing engineers. This new edition includes enhanced pedagogy (additional problems, more in-depth coverage of negative feedback, more effective layout), updated technology (current-feedback and folded-cascode amplifiers, and low-voltage amplifiers), and increased topical coverage (current-feedback amplifiers, switching regulators and phase-locked loops).

CMOS Digital Integrated Circuits: A First Course teaches the fundamentals of modern CMOS technology by focusing on central themes and avoiding overwhelming details. Extensive examples, self-exercises, and end-of-chapter problems assist in teaching the current practices of industry and subjects taught by graduate courses in microelectronics. Computer engineering curriculums can remove the analog electronics prerequisite altogether when adopting this book. This book is also unique in that it presents timing, the most difficult of the computer designer's tasks, and an issue that is avoided by all other textbooks. The remaining chapters describe memory, metal thermal and capacitive properties, FPGAs, layout, and then concludes with a chapter on how circuits are made in a chip factory. Supplementary materials for professors are available upon request via email to books@theiet.org. Beginning with discussions on the operation of electronic devices and analysis of the nucleus of digital design, the text addresses: the impact of interconnect, design for low power, issues in timing and clocking, design methodologies, and the effect of design automation on the digital design perspective.

The chosen semi-discrete approach of a reduction procedure of partial differential equations to ordinary differential equations and finally to difference equations gives the book its distinctiveness and provides a sound basis for a deep understanding of the fundamental concepts in computational fluid dynamics.

This book surveys the application of the recently developed technique of the wavelet transform to a wide range of physical fields, including astrophysics, turbulence, meteorology, plasma physics, atomic and solid state physics, multifractals occurring in physics, biophysics (in medicine and physiology) and mathematical physics. The wavelet transform can analyze scale-dependent characteristics of a signal (or image) locally, unlike the Fourier transform, and more flexibly than the windowed Fourier transform developed by Gabor fifty years ago. The continuous wavelet transform is used mostly for analysis, but the discrete wavelet transform allows very fast compression and transmission of data and speeds up numerical calculation, and is applied, for example, in the solution of partial differential equations in physics. This book will be of interest to graduate students and researchers in many fields of physics, and to applied mathematicians and engineers interested in physical application.

Wavelets seem to be the most efficient tool in signal denoising and compression. They can be used in an unlimited number of applications in all fields of chemistry where the instrumental signals are the source of information about the studied chemical systems or phenomena, and in all cases where these signals have to be archived. The quality of the instrumental signals determines the quality of answer to the basic analytical questions: how many components are in the studied systems, what are these components like and what are their concentrations? Efficient compression of the signal sets can drastically speed up further processing such as data visualization, modelling (calibration and pattern

recognition) and library search. Exploration of the possible applications of wavelets in analytical chemistry has just started and this book will significantly speed up the process. The first part, concentrating on theoretical aspects, is written in a tutorial-like manner, with simple numerical examples. For the reader's convenience, all basic terms are explained in detail and all unique properties of wavelets are pinpointed and compared with the other types of basis function. The second part presents applications of wavelets from many branches of chemistry which will stimulate chemists to further exploration of this exciting subject.

The fourth edition of CMOS Digital Integrated Circuits: Analysis and Design continues the well-established tradition of the earlier editions by offering the most comprehensive coverage of digital CMOS circuit design, as well as addressing state-of-the-art technology issues highlighted by the widespread use of nanometer-scale CMOS technologies. In this latest edition, virtually all chapters have been re-written, the transistor model equations and device parameters have been revised to reflect the significant changes that must be taken into account for new technology generations, and the material has been reinforced with up-to-date examples. The broad-ranging coverage of this textbook starts with the fundamentals of CMOS process technology, and continues with MOS transistor models, basic CMOS gates, interconnect effects, dynamic circuits, memory circuits, arithmetic building blocks, clock and I/O circuits, low power design techniques, design for manufacturability and design for testability.

Exponential improvement in functionality and performance of digital integrated circuits has revolutionized the way we live and work. The continued scaling down of MOS transistors has broadened the scope of use for circuit technology to the point that texts on the topic are generally lacking after a few years. The second edition of Digital Integrated Circuits: Analysis and Design focuses on timeless principles with a modern interdisciplinary view that will serve integrated circuits engineers from all disciplines for years to come. Providing a revised instructional reference for engineers involved with Very Large Scale Integrated Circuit design and fabrication, this book delves into the dramatic advances in the field, including new applications and changes in the physics of operation made possible by relentless miniaturization. This book was conceived in the versatile spirit of the field to bridge a void that had existed between books on transistor electronics and those covering VLSI design and fabrication as a separate topic. Like the first edition, this volume is a crucial link for integrated circuit engineers and those studying the field, supplying the cross-disciplinary connections they require for guidance in more advanced work. For pedagogical reasons, the author uses SPICE level 1 computer simulation models but introduces BSIM models that are indispensable for VLSI design. This enables users to develop a strong and intuitive sense of device and circuit design by drawing direct connections between the hand analysis and the SPICE models. With four new chapters, more than 200 new illustrations, numerous worked examples, case studies, and support provided on a dynamic website, this text significantly expands concepts presented in the first edition.

This unique book provides a comprehensive introduction to computational mathematics, which forms an essential part of contemporary numerical algorithms, scientific computing and optimization. It uses a theorem-free approach with just the right balance between mathematics and numerical algorithms. This edition covers all major topics in computational mathematics with a wide range of carefully selected numerical algorithms, ranging from the root-finding algorithm, numerical integration, numerical methods of partial differential equations, finite element methods, optimization algorithms, stochastic models, nonlinear curve-fitting to

data modelling, bio-inspired algorithms and swarm intelligence. This book is especially suitable for both undergraduates and graduates in computational mathematics, numerical algorithms, scientific computing, mathematical programming, artificial intelligence and engineering optimization. Thus, it can be used as a textbook and/or reference book.

This new edition of Classical Mechanics, aimed at undergraduate physics and engineering students, presents in a user-friendly style an authoritative approach to the complementary subjects of classical mechanics and relativity. The text starts with a careful look at Newton's Laws, before applying them in one dimension to oscillations and collisions. More advanced applications - including gravitational orbits and rigid body dynamics - are discussed after the limitations of Newton's inertial frames have been highlighted through an exposition of Einstein's Special Relativity. Examples given throughout are often unusual for an elementary text, but are made accessible to the reader through discussion and diagrams. Updates and additions for this new edition include: New vector notation in Chapter 1 An enhanced discussion of equilibria in Chapter 2 A new section on a body falling a large distance towards a gravitational source in Chapter 2 New sections in Chapter 8 on general rotation about a fixed principal axes, simple examples of principal axes and principal moments of inertia and kinetic energy of a body rotating about a fixed axis New sections in chapter 9: Foucault pendulum and free rotation of a rigid body; the latter including the famous tennis racquet theorem Enhanced chapter summaries at the end of each chapter Novel problems with numerical answers A solutions manual is available at:

www.wiley.com/go/mccall

The past 25 years have seen enormous growth in the capability and ubiquity of digital integrated circuits. In the mid 1980s, the industry had moved to CMOS technology for high performance digital design due to the power problems with both NMOS and bipolar technology. Complementary metal oxide semiconductor (CMOS) digital integrated circuits are the enabling technology for the modern information age. Because of their intrinsic features in low-power consumption, large noise margins, and ease of design, CMOS integrated circuits have been widely used to develop random access memory (RAM) chips, microprocessor chips, digital signal processor (DSP) chips, and application-specific integrated circuit (ASIC) chips. The popular use of CMOS circuits will grow with the increasing demands for low-power, low-noise integrated electronic systems in the development of portable computers, personal digital assistants (PDAs), portable phones, and multimedia agents. This book covers the complete treatment of CMOS circuits basic design concepts with detailed examples. Trend in digital integrated circuits is discussed with basic topologies used for designing circuits using CMOS transistors, viz., Static logic; Dynamic logic and Domino logic are explained. It typically addresses both the computer-aided analysis issues and the design issues for most of the circuit examples. Numerous research with results carried out in recent years on domino logic are also provided for illustration of basic concepts. Through rigorous analysis of CMOS circuits in this volume, students and research practitioners will be able to understand the fundamentals of CMOS VLSI design, which is the driving force behind the development of advanced computer hardware.