

Communication / Pulse Modulation Block schematic of Communication System, Base Band Signals and their bandwidth requirements, RF Bands, Types and Communication Channels (Transmission Lines, Parallel Wires, Co-axial Cables, Waveguides and Optical Fiber). Necessity of Modulation, Types of Modulation : AM, FM, PM and Pulse Modulation.Block schematic of PAM, PWM, PPM. Multiplexing : TDM, FDM.Amplitude Modulation Mathematical treatment and expression for AM, Frequency Spectrum, Modulation Index, Power Relation as applied to Sinusoidal Signals, Representation of AM wave, Mathematical treatment as applied to general signals in Communication, Generation of AM using non-linear property.Types of AM TransmittersDSB-FC, DSB-SC, SSB, ISB & VSB, their generation methods and Comparison in terms of Bandwidth and Transmission Power requirements & Complexity (Block diagram treatment only)Angle ModulationMathematical analysis of FM and PM using Sinusoidal Signals, Frequency spectrum, Mathematical treatment as applied to general non-sinusoidal Signals, Modulation index, Bandwidth requirements (all three relations), Narrowband and Wideband FM, Comparison of FM and PM, Direct and Indirect methods of FM generation, Need for Pre-emphasis, Comparison of AM and FM.AM & FM Receivers Block diagram of AM and FM receivers, Superheterodyne Receiver, Performance characteristics : Sensitivity, Selectivity, Fidelity, Image Frequency Rejection, IFRR, Tracking, De-emphasis, Mixers.AM DetectionEnvelope detection, Synchronous detection, Practical diode detection, AGC, SSB and DSB detection methods.FM DetectionPhase discriminator and Ratio Detector, Mathematical analysis of FM Detection.Noise Sources of Noise, Types of Noise, White Noise, SNR, Noise Figure, Noise Temperature, Friis formula for Noise Figure, Noise Bandwidth, Performance of AM (DSB, SSB & VSB) and FM in presence of Noise : Mathematical treatmentRadiation and Propagation Concept of Radiation, Basic Antenna System (Dipole), Antenna parameters, Yagi Antenna. Mechanism of Propagation : Ground Wave, Sky Wave, Space Wave, Duct, Tropospheric Scatter and Extraterrestrial Propagation. Concept of Fading and diversity reception.

Digital IC Applications

Logic Design

PULSE AND DIGITAL CIRCUITS

Elements Of Electronics Engineering

Switching Theory & Logic Design

The book covers all the aspects of the theory, analysis, and design of Electronic Circuits for the undergraduate course. The concepts of feedback amplifiers and oscillators, tuned amplifiers, wave shaping and multivibrator circuits, power amplifiers, and DC converters are explained in a comprehensive manner. The former part of the book focuses on the fundamental concepts of feedback amplifiers and oscillators. It explains the analysis of series-shunt, series-series, shunt-shunt, and shunt-series feedback amplifiers, stability and frequency compensation in feedback amplifiers. The concepts of the Barkhausen criterion for oscillations and the detailed analysis of various oscillator circuits including phase shift, Wien bridge, Hartley, Colpitt's, Clapp, ring, and crystal oscillators are included in the book. The oscillator amplitude stabilization is explained in support. Then the book focuses on the fundamental concept of tuned amplifiers. It explains topics such as coil losses, unloaded and loaded Q of tank circuits, analysis of single and double tuned amplifiers, the effect of cascading single tuned and double tuned amplifiers on bandwidth, stagger tuned amplifiers, stability of tuned amplifiers, and neutralization methods. The later part of the book incorporates the detailed analysis of various wave shaping circuits, including high pass and low pass RC and RL circuits, clipper and clamper circuits, bistable, monostable, and astable multivibrator circuits. The discussion of Schmitt trigger circuits and UJT is also included in the book. Finally, the book explains the class A, B, and C types of power amplifiers along with the discussion of the elimination of cross-over distortion. The book also covers the concepts of power amplifiers using power MOSFET and various types of d.c. to d.c. converters. The book uses plain and lucid language to explain each topic. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject, which makes the understanding of the concepts very clear and makes the subject more interesting.

This updated version of its internationally popular predecessor provides and introductory problem-solved text for understanding fundamental concepts of electronic devices, their design, and their circuitry. Providing an interface with Pspice, the most widely used program in electronics, new key features include a new chapter presenting the basics of switched mode power supplies, thirty-one new examples, and twenty-three PS solved problems.

Differential AmplifiersAnalysis of differential amplifier, common mode and differential mode gains, transfer characteristics, CMRR, IP and O/P impedances, high performance amplifiers using current source bias and current mirror connection.Drift ProblemThermal drift, input error signals and their compensation in differential amplifier.Operational AmplifierIdeal op-amp characteristics, cascading of differential amplifier, I/P, O/P stages and level translators, multistage op-amps, frequency response and stability, Frequency and phase compensation techniques. Some commercial op-amp parameters, features (IC 741, MC 1530).Op-amp Applicationsinverting and non-inverting, differential and bridge amplifiers, summing integrator, differentiator, V to I and I to V converters, op-amp feedback limiters using diodes, zener diodes, log and antilog amplifiers, analog multipliers, dividers, sample and hold circuits. Peak detectors, precision rectifiers, instrumentation amplifier, monostable and astable multivibrators, comparators.Schmitt trigger using op-amp.Active FiltersFirst and second order Butterworth filters, design and its response (LP, HP, BP, BE, Narrow band, all pass filters).TimersBasic timer circuit 555 timer used as astable and monostable multivibrator.Data Converters and Data Acquisition SystemD/A converters, basic D/A converter, weighted binary type, ladder R-2R D/A converters, performance parameters and source of errors.A/D ConvertersBasic V/F converter, V/T converter, single slope and dual slope converter, A/D converter using D/A converter, counter ramp, continuous counter ramp, successive approximation, flash converter.Communication AmplificationsCascade amplifiers MC1550 for video, RF and amplitude modulation, AGC application, PLL, brief study of PLL system, applications of PLL for AM, FM detection, FSK decoder, frequency synthesis using commercial PLL (IC 565).Voltage RegulatorsAnalysis and design of series and shunt regulators using DC amplifiers, some commercial voltage regulators (MC 78XX series, IC 723), high current negative voltage with foldback limiting concepts, switching regulators - basic concepts and applications.

Single Stage Amplifiers Review, Small signal analysis of junction transistor, Frequency response of common emitter amplifier, Common base amplifier, Common collector amplifier, JFET amplifiers, Common drain (CD) amplifier, Common gate amplifier, gain band-width product.Multistage AmplifiersMulti stage amplifiers, Methods of inter stage coupling, n-stage cascaded amplifier, Equivalent circuits, Miller's theorem, Frequency effects, Amplifier analysis, High input resistance transistor circuits, Cascode - transistor configuration, CE-CC amplifiers, Two stage RC coupled JFET amplifier (in common source (CS) configuration), Difference amplifier.High Frequency Transistor CircuitsTransistor at high frequencies, Hybrid- common emitter, Transconductance model, Determination of hybrid- conductances, Variation of Hybrid parameters with|C_i|,VCEand temperature. The parameters IT, expression for I, Current gain with resistance load, CE short circuit current gain, Hybrid - (p) parameters, Measurement of IT variation of Hybrid- parameters with Voltage, Current and temperature, Design of high frequency amplifier.Power AmplifiersClass A power amplifier, Maximum value of efficiency of class a amplifier, Transformer coupled amplifier, Transformer coupled audio amplifier, Push pull amplifier, Complimentary symmetry circuits (Transformer less class B power amplifier), Phase inverters, Class D operation, Class S operation, Heat sinks.Tuned Amplifiers - ISingle tuned capacitive coupled amplifier, Tapped single tuned capacitance coupled amplifier, Single tuned transformer coupled or inductively coupled amplifier, CE double tuned amplifier, Application of tuned amplifiers.Tuned Amplifiers - IIStagger tuning, Stability considerations, Tuned Class B and Class C amplifiers, Wideband amplifiers,Tuned amplifiers.Voltage RegulatorsTerminology, Basic regulator circuit, Short circuit protection, Current limiting, Specifications of voltage regulator circuits, Voltage multipliers.Switching and IC Voltage RegulatorsIC 723 voltage regulators and three terminal IC regulators, DC to DC converter, Switching regulators, Voltage Multipliers, UPS, SMPS.

Electronic Circuits - II

Switchgear & Protection

Electrical Circuit Analysis

Analog Electronic Circuits

Electronic Circuits II

Number Systems and CodesPhilosophy of number systems - complement representation of negative numbers - binary arithmetic - binary codes - error detecting and error correcting codes - hamming codes.Boolean Algebra and Switching FunctionsFundamental postulates of Boolean Algebra-Basic theorems and properties - switching functions - Canonical and Standard forms - Algebraic simplification - digital logic gates, properties of XOR gates - universal gates - Multilevel NAND/NOR realizations.Minimization of Switching FunctionsMap method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime - Implicant chart, simplification rules.Combinational Logic DesignDesign using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design IC chips, MUX Realization of switching functions Parity bit generator, Code-converters, Hazards and hazard free realizations.Programmable Logic Devices, Threshold LogicBasic PLD's-ROM, PROM, PLA, FLD Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.Sequential Circuits - ICClassification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples) Basic flop-flops-Triggering and excitation tables. Steps in synchronous sequential circuit design. Design of modulo-N Ring and shift counters, Serial binary adder, sequence detector.Sequential Circuits - IIFinite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.Algorithmic State MachinesSalient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

Electrical Circuit Theory and Technology is a fully comprehensive text for courses in electrical and electronic principles, circuit theory and electrical technology. The coverage takes students from the fundamentals of the subject, to the completion of a first year degree level course. Thus, this book is ideal for students studying engineering for the first time, and is also suitable for pre-degree vocational courses, especially where progression to higher levels of study is likely. John Bird's approach, based on 700 worked examples supported by over 1000 problems (including answers), is ideal for students of a wide range of abilities, and can be worked through at the student's own pace. Theory is kept to a minimum, placing a firm emphasis on problem-solving skills, and making this a thoroughly practical introduction to these core subjects in the electrical and electronic engineering curriculum. This revised edition includes new material on transients and laplace transforms, with the content carefully matched to typical undergraduate modules. Free Tutor Support Material including full worked solutions to the assessment papers featured in the book will be available at <http://textbooks.elsevier.com/>. Material is only available to lecturers who have adopted the text as an essential purchase. In order to obtain your password to access the material please follow the guidelines in the book.

The book is written for an undergraduate course on the Feedback Control Systems. It provides comprehensive explanation of theory and practice of control system engineering. It elaborates various aspects of time domain and frequency domain analysis and design of control systems. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The explanations are given using very simple and lucid language. All the chapters are arranged in a specific sequence which helps to build the understanding of the subject in a logical fashion. The book starts with explaining the various types of control systems. Then it explains how to obtain the mathematical models of various types of systems such as electrical, mechanical, thermal and liquid level systems. Then the book includes good coverage of the block diagram and signal flow graph methods of representing the various systems and the reduction methods to obtain simple system from the analysis point of view. The book further illustrates the steady state and transient analysis of control systems. The book covers the fundamental knowledge of controllers used in practice to optimize the performance of the systems. The book emphasizes the detailed analysis of second order systems as these systems are common in practice and higher order systems can be approximated as second order systems. The book teaches the concept of stability and time domain stability analysis using Routh-Hurwitz method and root locus method. It further explains the fundamentals of frequency domain analysis of the systems including co-relation between time domain and frequency domain. The book gives very simple techniques for stability analysis of the systems in the frequency domain, using Bode plot, Polar plot and Nyquist plot methods. It also explores the concepts of compensation and design of the control systems in time domain and frequency domain. The classical approach loses the importance of initial conditions in the systems. Thus, the book provides the detailed explanation of modern approach of analysis which is the state variable analysis of the systems including methods of finding the state transition matrix, solution of state equation and the concepts of controllability and observability. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the design and analysis of the control systems in the students. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

The knowledge of switchgear and apparatus protection plays an important role in the power system. The book is structured to cover the key aspects of the course Switchgear & Protection for undergraduate students. The book starts with the discussion of basics of protective relaying. The book includes comprehensive coverage of faults and analysis of symmetrical and unsymmetrical faults. The book explains the protection against overvoltage, lightning arresters and power system earthing. The book covers the characteristics of various types of relays such as electromagnetic relays, induction type relays, directional relays, differential relays, thermal relays, frequency relays and negative sequence relays. The detailed discussion of distance relays and static relays is also included in the book. The book also covers the various possible faults and methods of protection of transformers, generators, motors, busbars and transmission lines. The book further explains the theory of circuit interruption and various arc interruption methods. Finally, the book incorporates various types of circuit breakers, circuit breaker ratings and testing of circuit breakers. The book uses plain and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations and self-explanatory diagrams. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Digital Systems Design

Control System Engineering

Schaum's Outline of Electronic Devices and Circuits, Second Edition

Electromagnetic Field Theory

Electronic Measurements and Instrumentation

The book is written for an undergraduate course on the Signals and Systems. It provides comprehensive explanation of continuous time signals and systems, analogous systems, Fourier transform, Laplace transform, state variable analysis and z-transform analysis of systems. The book starts with the various types of signals and operations on signals. It explains the classification of continuous time signals and systems. Then it includes the discussion of analogous systems. The book Fourier transform and its applications to network analysis. The book also covers the Laplace transform, its properties and network analysis using Laplace transform with and without initial conditions. The book provides the detailed explanation of modern approach of system analysis called the state variable analysis. It includes various methods of state space representation of systems, finding the state transition matrix and solution of state equation. The discussion of network topology of ROC, properties of z-transform, inverse z-transform, z-transform analysis of LTI systems and pulse transfer function. The state space representation of discrete systems is also incorporated in the book. The book uses plain, simple and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Operational Amplifiers

Electronic Circuits

Electrical Measurements and Instrumentation