

Analog Digital Communication Engineering By Sanjay Sharma

Modern Digital and Analog Communication Systems
Analog and Digital Communication Lab
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ANALOG COMMUNICATION

Modern Digital and Analog Communication Systems

This book carries a holistic approach on the analog communication, with all the basic concepts pertaining to the subject described in it. The text provides an incisive insight into the subject via simple, elegant and explicit presentation. Organised in ten chapters, the book dexterously assimilates the various terms and techniques used in analog communication to enhance a broader understanding of the concepts and their applications. Commencing with the basic introduction, the book goes on to provide description on analog amplitude modulation, single sideband modulation, analog angle modulation, pulse modulation digital transmission of analog signals and multiplexing. Finally, it discusses about noise, random signal and processes, information theory and coding, and communication detectors and filters. The background of each topic in the book is prepared sensibly by providing suitable illustrations, numerical examples, detailed explanation of each step given, thereby making the understanding of complicated derivations easier. This well-structured book is specifically written for the undergraduate students of electronics and communication engineering, and postgraduate students of electronics.

Analog and Digital Communication Lab

PSpice for Digital Communications Engineering shows how to simulate digital communication systems and modulation methods using the very powerful Cadence Orcad PSpice version 10.5 suite of software programs. Fourier series and Fourier transform are applied to signals to set the ground work for the modulation techniques introduced in later chapters. Various baseband signals, including duo-binary baseband signaling, are generated and the spectra are examined to detail the unsuitability of these signals for accessing the public switched network. Pulse code modulation and time-division multiplexing circuits are examined and simulated where sampling and quantization noise topics are discussed. We construct a single-channel PCM system from transmission to receiver i.e. end-to-end, and import real speech signals to examine the problems associated with aliasing, sample and hold. Companding is addressed here and we look at the A and μ law characteristics for achieving better signal to quantization noise ratios. Several types of delta modulators are examined and also the concept of time division multiplexing is considered. Multi-level signaling techniques such as QPSK and QAM are analyzed and simulated and "home-made meters", such as scatter and eye meters, are used to assess the performance of these modulation systems in the presence of noise. The raised-cosine family of filters for shaping data before transmission is examined in depth where bandwidth efficiency and channel capacity is discussed. We plot several graphs in Probe to compare the efficiency of these systems. Direct spread spectrum is the last topic to be examined and simulated to show the advantages of spreading the signal over a wide bandwidth and giving good signal security at the same time.

DIGITAL AND ANALOG COMMUNICATION SYSTEMS

The rapid expansion of digital communications, particularly in the fields of TV and mobile telephones does not override the need for a clear understanding of analogue frequencies. Moreover, analogue technology will play an important role in communications well into the 21st century. Covering the principles behind analogue and digital communication systems, this book takes a less mathematical approach than is often found at this level. It begins with basic principles such as information systems, data compression and error detection before moving on to more advanced topics such as Pulse Code Modulation systems and digital microwave systems. Data protocols are also given so that the reader can gain a good understanding of more complex communication systems. 'Analogue and Digital Communication Techniques' has been designed for students studying HND electronic communication courses but will also be useful to junior undergraduates on similar courses. Some knowledge of basic electronics is assumed.

ANALOG AND DIGITAL COMMUNICATION

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. For a one/two-semester senior or first-year graduate level course in analog and digital communications. This text is also a suitable reference for electrical engineers for all basic relevant topics in digital communication system design. With an emphasis on digital communications, Communication Systems Engineering, introduces the basic principles underlying the analysis and design of communication systems. In addition, this text gives a solid introduction to analog communications and a review of important mathematical foundation topics.

Analog and Digital Communication Systems

This text takes an integrated approach toward communications, with little dichotomy between Analogue and Digital. Studies of telecommunications in undergraduate Engineering education were traditionally analogue. In fact, until the late 1960s, very few schools were teaching digital communication concepts to undergraduates. As digital communications rapidly replaced analogue communications during the 1970s and 1980s, some universities attempted to keep up with the times by incorporating some digital communications into a first course in communications. Others proposed separate courses dealing with digital communications, often with analogue communications as the prerequisite.

Digital Communication

Designed to help teach and understand communication systems using a classroom-tested, active learning approach. Discusses communication concepts and algorithms, which are explained using simulation projects, accompanied by MATLAB and Simulink Provides step-by-step code exercises and instructions to implement execution sequences Includes a companion website that has MATLAB and Simulink model samples and templates (password: matlab)

Fundamentals of Communication Systems

Modern communications technology demands smaller, faster and more efficient circuits. This book reviews the fundamentals of electromagnetism in passive and active circuit elements, highlighting various effects and potential problems in designing a new circuit. The author begins with a review of the basics - the origin of resistance, capacitance, and inductance - then progresses to more advanced topics such as passive device design and layout, resonant circuits, impedance matching, high-speed switching circuits, and parasitic coupling and isolation techniques. Using examples and applications in RF and microwave systems, the author describes transmission lines, transformers, and distributed circuits. State-of-the-art developments in Si based broadband analog, RF, microwave, and mm-wave circuits are reviewed. With up-to-date results, techniques, practical examples, illustrations and worked examples, this book will be valuable to advanced

undergraduate and graduate students of electrical engineering, and practitioners in the IC design industry. Further resources for this title are available at www.cambridge.org/9780521853507.

Analog And Digital Communication

Communication Systems, by nature, is largely an abstract area of study. In this text, the authors have intrinsically intertwined theory and pedagogy with the concepts. This is especially done to immensely enhance visualization of this subject and its mathematical identities. Adequate topical enhancements according to current curriculum requirements, crisp descriptions, and numerous illustrations make this book is a very interesting read. In addition, thoroughly refreshed pedagogical aids are provided as useful learning tools for all students. feature • In depth review of the probabilistic nature of signals • Generation and detection of analog and digital signals discussed in detail • Elaborate coverage on noise considerations and system performances

Digital Communication Systems: First Edition

Offers concise, practical knowledge on modern communication systems to help students transition smoothly into the workplace and beyond This book presents the most relevant concepts and technologies of today's communication systems and presents them in a concise and intuitive manner. It covers advanced topics such as Orthogonal Frequency-Division Multiplexing (OFDM) and Multiple-Input Multiple-Output (MIMO) Technology, which are enabling technologies for modern communication systems such as WiFi (including the latest enhancements) and LTE-Advanced. Following a brief introduction to the field, Digital Communication for Practicing Engineers immerses readers in the theories and technologies that engineers deal with. It starts off with Shannon Theorem and Information Theory, before moving on to basic modules of a communication system, including modulation, statistical detection, channel coding, synchronization, and equalization. The next part of the book discusses advanced topics such as OFDM and MIMO, and introduces several emerging technologies in the context of 5G cellular system radio interface. The book closes by outlining several current research areas in digital communications. In addition, this text: Breaks down the subject into self-contained lectures, which can be read individually or as a whole Focuses on the pros and cons of widely used techniques, while providing references for detailed mathematical analysis Follows the current technology trends, including advanced topics such as OFDM and MIMO Touches on content this is not usually contained in textbooks such as cyclo-stationary symbol timing recovery, adaptive self-interference canceler, and Tomlinson-Harashima precoder Includes many illustrations, homework problems, and examples Digital Communication for Practicing Engineers is an ideal guide for graduate students and professionals in digital communication looking to understand, work with, and adapt to the current and future technology.

Schaum's Outline of Analog and Digital Communications

Thorough coverage of basic digital communication system principles ensures that readers are exposed to all basic relevant topics in digital communication system design. The use of CD player and JPEG image coding standard as examples of systems that employ modern communication principles allows readers to relate the theory to practical systems. Over 180 worked-out examples throughout the book aids readers in understanding basic concepts. Over 480 problems involving applications to practical systems such as satellite communications systems, ionospheric channels, and mobile radio channels gives readers ample opportunity to practice the concepts they have just learned. With an emphasis on digital communications, Communication Systems Engineering, Second Edition introduces the basic principles underlying the analysis and design of communication systems. In addition, this book gives a solid introduction to analog communications and a review of important mathematical foundation topics. New material has been added on wireless communication systems—GSM and CDMA/IS-94; turbo codes and iterative decoding; multicarrier (OFDM) systems; multiple antenna systems. Includes thorough coverage of basic digital communication system principles—including source coding, channel coding, baseband and carrier modulation, channel distortion, channel equalization, synchronization, and wireless communications. Includes basic coverage of analog modulation such as amplitude modulation, phase modulation, and frequency modulation as well as demodulation methods. For use as a reference for electrical engineers for all basic relevant topics in digital communication system design.

Analog Communication Engineering Fundamentals

Lathi's trademark user-friendly and highly readable text presents a complete and modern treatment of communication systems. It begins by introducing students to the basics of communication systems without using probabilistic theory. Only after a solid knowledge base--an understanding of how communication systems work--has been built are concepts requiring probability theory covered. This third edition has been thoroughly updated and revised to include expanded coverage of digital communications. New topics discussed include spread-spectrum systems, cellular communication systems, global positioning systems (GPS), and an entire chapter on emerging digital technologies (such as SONET, ISDN, BISDN, ATM, and video compression). Ideal for the first communication systems course for electrical engineers, Modern Digital and Analog Communication Systems offers students a superb pedagogical style; it consistently does an excellent job of explaining difficult concepts clearly, using prose as well as mathematics. The author makes every effort to give intuitive insights--rather than just proofs--as well as heuristic explanations of theoretical results wherever possible. Featuring lucid explanations, well-chosen examples clarifying abstract mathematical results, and excellent illustrations, this unique text is highly informative and easily accessible to students.

Analog and Digital Communication Systems

This book primarily focuses on the design of analog and digital communication systems; and has been structured to cater to the second year engineering undergraduate students of Computer Science, Information Technology, Electrical Engineering and Electronics and Communication departments. For better understanding, the basics of analog communication systems are outlined before the digital communication systems section. The content of this book is also suitable for the students with little knowledge in communication systems. The book is divided into five modules for efficient presentation, and it provides numerous examples and illustrations for the detailed understanding of the subject, in a thorough manner. Technical topics discussed in the book include: Analog modulation techniques-AM, FM and PM Digital modulation techniques-ASK, PSK, FSK, QPSK, MSK and M-ary modulation Pulse modulation techniques and Data communication Source coding techniques-Shannon Fano and Huffman coding; channel coding techniques-Linear block codes and convolutional codes Advanced communication techniques topics includes-Cellular communication, Satellite communication and multiple access schemes.

Communication Systems Engineering

The second edition of this accessible book provides readers with an introductory treatment of communication theory as applied to the transmission of information-bearing signals. While it covers analog communications, the emphasis is placed on digital technology. It begins by presenting the functional blocks that constitute the transmitter and receiver of a communication system. Readers will next learn about electrical noise and then progress to multiplexing and multiple access techniques.

Digital Communication Systems Engineering with Software-Defined Radio

New edition of an introductory text that balances theoretical foundations with practical design. Reorganization and updates in this edition include the section on digital communications as well as design applications and computer exercises: many graphs are prepared and formulas solved using MATLAB o

Basic Electronics Engineering

This lab book is intended for the Junior/senior engineering/Technology students. This book should accompany regular textbook in analog and digital communication. The lab exercises use MATLAB/SIMULINK, Arduino Uno and employs hardware circuits.

PSpice for Digital Communications Engineering

PSpice for Digital Communications Engineering shows how to simulate digital communication systems and modulation methods using the very powerful Cadence Orcad PSpice version 10.5 suite of software programs. Fourier series and Fourier transform are applied to signals to set the ground work for the modulation techniques introduced in later chapters. Various baseband signals, including duo-binary baseband signaling, are generated and the spectra are examined to detail the unsuitability of these signals for accessing the public switched network. Pulse code modulation and time-division multiplexing circuits are examined and simulated where sampling and quantization noise topics are discussed. We construct a single-channel PCM system from transmission to receiver i.e. end-to-end, and import real speech signals to examine the problems associated with aliasing, sample and hold. Companding is addressed here and we look at the A and μ law characteristics for achieving better signal to quantization noise ratios. Several types of delta modulators are examined and also the concept of time division multiplexing is considered. Multi-level signaling techniques such as QPSK and QAM are analyzed and simulated and "home-made meters", such as scatter and eye meters, are used to assess the performance of these modulation systems in the presence of noise. The raised-cosine family of filters for shaping data before transmission is examined in depth where bandwidth efficiency and channel capacity is discussed. We plot several graphs in Probe to compare the efficiency of these systems. Direct spread spectrum is the last topic to be examined and simulated to show the advantages of spreading the signal over a wide bandwidth and giving good signal security at the same time.

Analog Communication

The revised edition deals with the basics of communication systems required at the UG level in detail and in a user-friendly manner. The understanding of the subject has been very well created with the help of easy to understand mathematical usage in numerous solved and unsolved examples. Maintaining the same writing style, the authors have tried to keep the readers abreast with the latest developments in the field.

Digital Communication

For second and third year introductory communication systems courses for undergraduates, or an introductory graduate course. This revision of Couch's authoritative text provides the latest treatment of digital communication systems. The author balances coverage of both digital and analog communication systems, with an emphasis on design. Students will gain a working knowledge of both classical mathematical and personal computer methods to analyze, design, and simulate modern communication systems. MATLAB is integrated throughout.

Analog and Digital Communication Engineering

Principles Of Communication

The electrical engineering curriculum in every university now includes either a one-semester or one-year course in communications theory and practice and/or communications engineering. An indispensable supplement to the standard texts used in those courses, this new edition of the classic Schaum's Outline has been thoroughly revised and updated to conform to the latest changes in the engineering curriculum. It now features new chapters on signals and spectra, signal transmission and filtering, information channel capacity, and error-control coding. It covers noiseless modulation theory, including amplitude and angle modulation, and includes expanded coverage of digital communications. It also features 430 fully solved problems. Hwei Hsu, Ph.D., is a professor and former chair of the Electrical Engineering Department at Fairleigh Dickinson University.

Schaum's Outline of Theory and Problems of Analog and Digital Communications

Modern communications technology demands smaller, faster and more efficient circuits. This book reviews the fundamentals of electromagnetism in passive and active circuit elements, highlighting various effects and potential problems in designing a new circuit. The author begins with a review of the basics - the origin of resistance, capacitance, and inductance - then progresses to more advanced topics such as passive device design and layout, resonant circuits, impedance matching, high-speed switching circuits, and parasitic coupling and isolation techniques. Using examples and applications in RF and microwave systems, the author describes transmission lines, transformers, and distributed circuits. State-of-the-art developments in Si based broadband analog, RF, microwave, and mm-wave circuits are reviewed. With up-to-date results, techniques, practical examples, illustrations and worked examples, this book will be valuable to advanced undergraduate and graduate students of electrical engineering, and practitioners in the IC design industry. Further resources for this title are available at www.cambridge.org/9780521853507.

Analogue and Digital Communication Techniques

The renowned communications theorist Robert Gallager brings his lucid writing style to the study of the fundamental system aspects of digital communication for a one-semester course for graduate students. With the clarity and insight that have characterized his teaching and earlier textbooks, he develops a simple framework and then combines this with careful proofs to help the reader understand modern systems and simplified models in an intuitive yet precise way. A strong

narrative and links between theory and practice reinforce this concise, practical presentation. The book begins with data compression for arbitrary sources. Gallager then describes how to modulate the resulting binary data for transmission over wires, cables, optical fibers, and wireless channels. Analysis and intuitive interpretations are developed for channel noise models, followed by coverage of the principles of detection, coding, and decoding. The various concepts covered are brought together in a description of wireless communication, using CDMA as a case study.

Electromagnetics for High-Speed Analog and Digital Communication Circuits

Modern Digital and Analog Communication Systems is ideal for the first communication systems course for electrical and computer engineers; it offers its readers a consistently superb pedagogical style and explains complex subjects and concepts clearly, using both mathematics and heuristics. This new edition seamlessly incorporates many new technological advances in Lathi's trademark style of user-friendliness and high readability. The text begins by introducing students to a panoramic view of communication systems, explaining important concepts of communication theory in a heuristic way. Only after a solid introduction to basic communication systems is analysis of communication systems requiring probability and random processes presented. The authors use real world examples to capture the students' attention and enable them to easily relate the course materials with their daily experience of communication tools. The text features easy-to-understand examples and MatLab exercises to clarify mathematical results and proofs. Among the newly introduced topics are spread spectrum communications and orthogonal frequency division multiplexing (OFDM), error correction coding, soft-decoding, turbo codes and low density parity check (LDPC) codes. To better motivate various topics, the text provides many related applications including the latest wire-line (DSL) services, cellular systems, and the wireless local area networks (LANs). This unique text is highly informative, interactive, and accessible to beginning students as well as seasoned practitioners.

Electromagnetics for High-Speed Analog and Digital Communication Circuits

Communication Systems, 2E

Digital communications is an elective course often taken as the second semester of an analog/digital sequence or as a follow-on course to communication systems. This new text offers the most complete, up-to-date coverage available on the principles of digital communications, focusing on core principles and relating theory to practice. Numerous examples, worked out in detail, have been included to help the reader develop an intuitive grasp of the theory. The text also incorporates MATLAB-based computer experiments throughout, as well as themed examples and a large amount of quality

homework problems. Because the book covers a broad range of topics in digital communications, it should satisfy a variety of backgrounds and interests.

Digital Communication

About The Book: The book provides a detailed, unified treatment of theoretical and practical aspects of digital and analog communication systems, with emphasis on digital communication systems. It integrates theory-keeping theoretical details to a minimum-with over 60 practical, worked examples illustrating real-life methods. The text emphasizes deriving design equations that relate performance of functional blocks to design parameters. It illustrates how to trade off between power, band-width and equipment complexity while maintaining an acceptable quality of performance. Material is modularized so that appropriate portions can be selected to teach several different courses. The book also includes over 300 problems and an annotated bibliography in each chapter.

Communication Systems Engineering

Analog Communication Engineering theory presented in classroom style lecture. Most suitable for as a first course for UG student.

COMMUNICATION SYSTEMS

"This unique resource provides you with a practical approach to quickly learning the software-defined radio concepts you need to know for your work in the field. By prototyping and evaluating actual digital communication systems capable of performing "over-the-air" wireless data transmission and reception, this volume helps you attain a first-hand understanding of critical design trade-offs and issues. Moreover you gain a sense of the actual "real-world" operational behavior of these systems. With the purchase of the book, you gain access to several ready-made Simulink experiments at the publisher's website. This collection of laboratory experiments, along with several examples, enables you to successfully implement the designs discussed the book in a short period of time. These files can be executed using MATLAB version R2011b or later. "

PSpice for Analog Communications Engineering

In PSpice for Analog Communications Engineering we simulate the difficult principles of analog modulation using the superb free simulation software Cadence Orcad PSpice V10.5. While use is made of analog behavioral model parts (ABM), we use actual circuitry in most of the simulation circuits. For example, we use the 4-quadrant multiplier IC AD633 as a modulator

and import real speech as the modulating source and look at the trapezoidal method for measuring the modulation index. Modulation is the process of relocating signals to different parts of the radio frequency spectrum by modifying certain parameters of the carrier in accordance with the modulating/information signals. In amplitude modulation, the modulating source changes the carrier amplitude, but in frequency modulation it causes the carrier frequency to change (and in phase modulation it's the carrier phase). The digital equivalent of these modulation techniques are examined in PSpice for Digital Communications Engineering, where we look at QAM, FSK, PSK and variants. We examine a range of oscillators and plot Nyquist diagrams showing the marginal stability of these systems. The superheterodyne principle, the backbone of modern receivers is simulated using discrete components followed by simulating complete AM and FM receivers. In this exercise we examine the problems of matching individual stages.

Modern Digital and Analog Communication Systems

Elements of Communication System and its Limitations Amplitude Modulation Amplitude modulation and detection, Generation and detection of DSB-SC, SSB and vestigial side band modulation, Carrier acquisition. AM transmitters and receivers, Superheterodyne receiver, IF amplifiers, AGC circuits, Frequency division multiplexing. Angle Modulation Basic definitions, Narrow band and wideband frequency modulation, Transmission bandwidth of FM signals. Generation and detection of frequency modulation. Noise : External noise, Internal noise, Noise calculations, Signal to noise ratio, Noise in AM and FM systems. Pulse Modulation Sampling process, Analog pulse modulation systems, Pulse amplitude modulation, Pulse width modulation and pulse position modulation. Waveform Coding Techniques : Discretization in time and amplitude, Quantization process, Quantization noise, Pulse code modulation, Differential pulse code modulation, Delta modulation and adaptive delta modulation. Digital Modulation Techniques Types of digital modulation, Waveforms for amplitude, frequency and phase shift keying, Methods of generation of coherent and non-coherent, ASK, FSK and PSK, Comparison of above digital techniques. Time Division Multiplexing Fundamentals, Electronic commutator, Bit/byte interleaving, T1 carrier system, Synchronization and signaling of T1, TDM and PCM hierarchy, Synchronization techniques. Information Theory : Measure of information, Entropy and information rate, Channel capacity, Hartley Shannon law, Huffman coding, Shannon Fano coding.

Principles of Digital Communication

Digital and Analog Communication Systems

Revised to conform to the current curriculum in electrical and computer engineering, and reflecting the increased importance of digital technology in engineering, this is an updated, streamlined edition of the classic outline in analogue

and digital communications.

Digital Communication for Practicing Engineers

Introduction to Digital Communications explores the basic principles in the analysis and design of digital communication systems, including design objectives, constraints and trade-offs. After portraying the big picture and laying the background material, this book lucidly progresses to a comprehensive and detailed discussion of all critical elements and key functions in digital communications. The first undergraduate-level textbook exclusively on digital communications, with a complete coverage of source and channel coding, modulation, and synchronization. Discusses major aspects of communication networks and multiuser communications Provides insightful descriptions and intuitive explanations of all complex concepts Focuses on practical applications and illustrative examples. A companion Web site includes solutions to end-of-chapter problems and computer exercises, lecture slides, and figures and tables from the text

Synchronization in Digital Communication Systems

Analog Communication provides an exhaustive coverage of the fundamental concepts and recent developments in communication theory. "The book follows a bottom-up approach by building up the basic concepts of conventional modulation systems in the initial chapters and describing the latest trend in communication towards the end. After introducing the concepts of communication theory, it discusses amplitude modulation, angle modulation, and pulse modulation. It further covers the concept of time division multiplexing (TDM), frequency division multiplexing (FDM), and delta and adaptive delta modulation. The book also provides a chapter on digital communication, which briefly covers the concept of frequency shift keying (FSK), pulse shift keying (PSK), quadrature amplitude modulation (QAM), etc. A separate chapter on noise highlights the different types of noise encountered in communication systems and their effects on various types of modulation. Written in a lucid manner, the book includes a large number of circuit diagrams, worked-out examples, and MATLAB examples, thereby enabling the users to have a sound grasp of the concepts presented and their applications"

Introduction to Analog and Digital Communication

Do you need to know how to develop more efficient digital communication systems? Based on the author's experience of over thirty years in industrial design, this practical guide provides detailed coverage of synchronization subsystems and their relationship with other system components. Readers will gain a comprehensive understanding of the techniques needed for the design, performance analysis and implementation of synchronization functions for a range of different modern communication technologies. Specific topics covered include frequency-looked loops in wireless receivers, optimal

OFDM timing phase determination and implementation, and interpolation filter design and analysis in digital resamplers. Numerous implementation examples help readers to develop the necessary practical skills, and slides summarizing key concepts accompany the book online. This is an invaluable guide and essential reference for both practicing engineers and graduate students working in digital communications.

An Introduction to Analog and Digital Communications, 2nd Edition

"Digital Communications" presents the theory and application of the philosophy of Digital Communication systems in a unique but lucid form. The book inserts equal importance to the theory and application aspect of the subject whereby the authors selected a wide class of problems. The Salient features of the book are: 1. The foundation of Fourier series, Transform and wavelets are introduces in a unique way but in lucid language. 2. The application area is rich and resemblance to the present trend of research, as we are attached with those areas professionally. 3. Elegant exercise section is designed in such a way that, the readers can get the flavor of the subject and get attracted towards the future scopes of the subject. 4. Unparallel tabular, flow chart based and pictorial methodology description will be there for sustained impression of the proposed design/algorithms in mind.

PSpice for Digital Communications Engineering

Thorough coverage of basic digital communication system principles ensures that readers are exposed to all basic relevant topics in digital communication system design. The use of CD player and JPEG image coding standard as examples of systems that employ modern communication principles allows readers to relate the theory to practical systems. Over 180 worked-out examples throughout the book aids readers in understanding basic concepts. Over 480 problems involving applications to practical systems such as satellite communications systems, ionospheric channels, and mobile radio channels gives readers ample opportunity to practice the concepts they have just learned. With an emphasis on digital communications, Communication Systems Engineering, Second Edition introduces the basic principles underlying the analysis and design of communication systems. In addition, this book gives a solid introduction to analog communications and a review of important mathematical foundation topics. New material has been added on wireless communication systems -- GSM and CDMA/IS-94; turbo codes and iterative decoding; multicarrier (OFDM) systems; multiple antenna systems. Includes thorough coverage of basic digital communication system principles -- including source coding, channel coding, baseband and carrier modulation, channel distortion, channel equalization, synchronization, and wireless communications. Includes basic coverage of analog modulation such as amplitude modulation, phase modulation, and frequency modulation as well as demodulation methods.

Problem-Based Learning in Communication Systems Using MATLAB and Simulink

This textbook is for undergraduate students of electronics and telecommunication engineering and allied disciplines, as well as diploma and science courses. This book offers an introductory survey of the conceptual development of the subject. It provides simple and lucid presentations of the essential principles, formulae and definitions of Digital Communications.

Introduction to Digital Communications

The book, though comprehensive, has been developed in a reader-friendly fashion by providing numerous pedagogical aids for the study of Communication Systems. The product has been designed as per the need of the student whose requirement is to gain apt knowledge as per the examinations. An important feature is that the book takes a balanced approach towards both Analog & Digital Communications. feature • MATLAB incorporated within text (approx 120 examples) • Important points and commonly made mistakes specially highlighted • Numerous interesting pedagogical features closely resembling examination patterns – fill-in-the blanks, MCQs, short answer type questions etc

ANALOG COMMUNICATION

Communication process, Source of information, Communication channels, Base-band and Pass-band signals, Representation of signal and systems, The modulation process, Primary communication resources, Analog versus digital communications. Amplitude modulation Frequency division and time division multiplexing, Suppressed carrier systems, Single side band transmission, Amplitude modulation with carrier power, Effect of frequency and phase errors in synchronous detection, Comparison of various AM systems, Vestigial side band transmission. Angle Modulation Narrow and wide band FM, Multiple frequency and square wave modulation, Linear and Non-linear modulation, Phase modulation, Demodulation of FM signals, Noise reduction. Pulse Modulation Pulse amplitude modulation, Other forms of pulse modulation, Bandwidth required for transmission PAM signals, Comparison of frequency division and Time division multiplexed systems. Noise Different types of noise, Noise calculations, Equivalent noise bandwidth, Noise figures, Effective noise temperature, Noise figure in cascaded stages. Performance of Communication Systems Noise calculation in communication systems, Noise in amplitude modulated, angle modulated and pulse modulated systems, Comparison of coded and un-coded systems. Information Transmission Measures of information, Channel capacity, transmission of continuous signals, Exchange of bandwidth for signal to noise ratio, Efficiency of PCM systems.

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