

Subjects : Electronics and (Tele-) Communication Engineering

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| <ol style="list-style-type: none">1. Basic Electrical Engineering: DC networks, Single phase AC circuits, Magnetic circuits, Three-phase AC circuits2. Network Theory: Overview of Network Theorems, Two Port Networks and Network Functions, Resonance and Coupled Circuits, Laplace Transform for Network Analysis, Network Synthesis, Network Topology, Passive Filter3. Electronic Circuits: Amplifiers Design And Analysis - Single Stage and multi stage, Feed Back Amplifier, Oscillators, Large Signal Amplifiers |
| <ol style="list-style-type: none">4. Electronic Devices: Energy Bands and Charge Carriers in Semiconductors, PN Junction Diode, Bipolar Junction Transistor, Field Effect Transistor5. Analog System Design: Fundamentals of Operational Amplifier, Linear Op-amp Circuit, Non-linear Circuit Applications, Signal Generators, Limitations of Practical Op-amps, Voltage Reference, Voltage Regulators, D/A and A/D converters, Active Filters, Nonlinear Amplifiers and Phase-Locked Loops6. Digital Electronic Circuits: Basics of Digital Electronic Circuits, Logic gates, Boolean Algebra, Combinational logic circuits, Sequential logic circuits, Logic Families7. Digital System Design: Basics of VHDL, HDL Modeling of Combinational Logics, HDL Modeling of Sequential-Circuit Building Blocks, Memory and Programmable logic8. IC Technology: Issues and Challenges in IC Design, IC Fabrication Processes, BJT, MOSFET fabrication, Design of MOSFET based digital ICs, IC Layout, Tools for design and layout of ICs9. VLSI Technology: Basic Electrical Properties of MOS circuits, Circuit Characteristic and Performance Estimation, Dynamic CMOS Design, Design of Subsystem |
| <ol style="list-style-type: none">10. Signals and Systems: Basic of Signals and Systems, LTI Systems, Fourier Analysis – continuous time and discrete time, Sampling and Reconstruction, Laplace Transform, Z – Transform, Random Signals and Systems, Random Signal Analysis11. Analog Communication: Amplitude Modulation, Angle Modulation, Radio Receivers, Noise, Pulse Modulation12. Digital Communication : Information Theory, Pulse Modulation, Signal Space Analysis, Baseband Pulse Transmission, Pass-band Digital Transmission, Error Coding13. Wireless Communication: Basics of Wireless Communication, Cellular Concept, Large-Scale Path Loss, Small-Scale fading and Multipath Propagation, Code Division Multiple Access, Equalization, Diversity, Channel Coding, Multiple Access Techniques14. Optical Communication: Basics of Optical Communication, Transmission Characteristics of Optical Fibers, Optical Sources and Detectors, Optical System and Networks, Optical Sensors15. Communication System Engineering: Wired system, Wireless system, Satellite system16. Microwave Engineering: Transmission Lines, Waveguides, Network Representation, Microwave Passive Circuit Components, Microwave Devices, Microwave integrated circuits |



17. Antenna and Wave Propagation: Electromagnetic Theory, Basic Concepts of Antenna, Antenna Arrays, Practical Antennas, Matching Network, Wave Propagation
18. Microprocessor: Architecture of Microprocessor, Programming of Microprocessor, Data Transfer, Interfacing, Advanced microprocessors
19. Microcontrollers and Embedded System: Basics of Microcontrollers, 8051 Microcontroller, Other Microcontrollers, Interfacing, Embedded Systems, Embedded Firmware, RTOS Based Embedded System Design
20. Signal Processing: Discrete-time signal and linear systems, Realization of digital systems, Design of digital filters – IIR and FIR, Finite word length effects, Digital signal processing applications
21. Instrumentation and Electronic Measurements: Measurement and Error, Bridges, Electromagnetic Instruments (D – Arsonval, etc.), Electronic Instruments (Multimeter, Frequency Meter, Oscilloscopes, Digital Storage Oscilloscopes, etc.), Special instruments (Wave Analyzer, Harmonic Distortion Analyzer, Spectrum Analyzer, FFT Analyzer, Energy meter, etc.), Transducers, Basics of Data Acquisition System
May be considered for inclusion (optional)
22. Computing: Program Development using C, Object oriented programming

