Subjects : Electronics and (Tele-) Communication Engineering

1. Basic Electrical Engineering: **DC networks, Single phase AC circuits, Magnetic circuits, Three-phase AC circuits**
2. 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 Filter**
3. Electronic Circuits: **Amplifiers Design And Analysis - Single Stage and multi stage, Feed Back Amplifier, Oscillators, Large Signal Amplifiers**

4. Electronic Devices: **Energy Bands and Charge Carriers in Semiconductors, PN Junction Diode, Bipolar Junction Transistor, Field Effect Transistor**
5. AnalogSystem 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 Loops**
6. Digital Electronic Circuits: **Basics of Digital Electronic Circuits, Logic gates, Boolean Algebra, Combinational logic circuits, Sequential logic circuits, Logic Families**
7. Digital System Design: **Basics of VHDL, HDL Modeling of Combinational Logics, HDL Modeling of Sequential-Circuit Building Blocks, Memory and Programmable logic**
8. IC Technology: **Issues and Challenges in IC Design, IC Fabrication Processes, BJT, MOSFET fabrication, Design of MOSFFT based digital ICs, IC Layout, Tools for design and layout of ICs**
9. VLSI Technology: **Basic Electrical Properties of MOS circuits, Circuit Characteristic and Performance Estimation, Dynamic CMOS Design, Design of Subsystem**

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 Analysis**
11. Analog Communication: **Amplitude Modulation, Angle Modulation, Radio Receivers, Noise, Pulse Modulation**
12. Digital Communication : **Information Theory, Pulse Modulation, Signal Space Analysis, Baseband Pulse Transmission, Pass-band Digital Transmission, Error Coding**
13. 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 Techniques**
14. Optical Communication: **Basics of Optical Communication, Transmission Characteristics of Optical Fibers, Optical Sources and Detectors, Optical System and Networks, Optical Sensors**
15. Communication System Engineering: **Wired system, Wireless system, Satellite system**
16. 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**