1. VLSI Design and Embedded Systems: Micro-electronics, MOS and Bi-CMOS circuit design, scaling, sub-system design and layout, testability, Embedded micro-controller, CISC & RISC architecture.

2. Signals and Systems, DSP: Types of Signals and Systems, properties of systems, convolution, correlation, Fourier series and transforms (Discrete Time), Z-transform, DFT and FFT, windowing techniques, analog and digital filter design, IIR, FIR filter design, finite word length effect.

3. Analog and Digital Communication and Networking: AM, FM, PM, digital communication – sampling, digital coding of analog wave forms, ISI, digital modulation techniques – PSK, BPSK, QPSK, MSK, spread spectrum. ISO / OSI model, TCP/IP model, internetworking.

4. Antennas and Micro Waves: Transmission lines, Characteristic impedance, impedance transformation, smith chart, impedance matching, Wave guides, modes in rectangular guides, boundary conditions, cutoff frequencies, dispersion relation.; Antennas: Dipole antennas, antenna arrays, radiation pattern, reciprocity theorem, antenna gain; Passive and active microwave devices, microwave measurement, Radar systems, Radio telemetry.

5.Power Electronics: Diodes, transistors, amplifiers, voltage regulators and power supplies, characteristics of DIAC, TRIAC, MOSFET, IGBT, Thyristors and its control circuits, control rectifiers, commutation techniques, AC voltage controller, DC choppers, close loop control of DC drives.