PhD Syllabus
Department of Electronics and Communication

Communication theory


Digital and embedded Systems

Combinatorial circuits, sequential circuits, number representation – fixed and floating point, FPGAs; computer architecture – data representation, addressing modes, ALU, CPU, pipelining, cache and virtual memory; microcontrollers – ARM, PIC, ATMEGA, USART, I2C, SPI interfaces, assembly language programming; AMBA Bus architectures

Optics and Photonics

Static Electric Fields - Co-ordinate systems – Basic postulates and theorems in electromagnetics - Electrostatics - Magneto statics - Maxwell’s equations – Boundary conditions - Wave equation – Diffraction and interference.

Digital and embedded Systems

Combinatorial circuits, sequential circuits, number representation – fixed and floating point, FPGAs; computer architecture – data representation, addressing modes, ALU, CPU, pipelining, cache and virtual memory; microcontrollers – ARM, PIC, ATMEGA, USART, I2C, SPI interfaces, assembly language programming; AMBA Bus architectures

RF, microwave and antennas


Semiconductor technology

Semiconductor materials, crystal structures, quantum mechanics, doping, mobility and conductivity, fermi level, equilibrium carrier concentrations, diffusion and drift, forward and reverse biased pn junction characteristics and properties, band diagrams, MOS capacitor, MOSFET physics, ideal MOSFET characteristics, threshold and sub threshold characteristics, short channel effects, current trends in MOSFET technology, LED physics, Photodetectors, Solar cell concepts, Lasers, optical fibers, waveguides, fabrication technology for ICs - lithography, ion implantation, etching, thin film deposition, interconnects.

Signal processing