

# Silver Oak College of Engineering & Technology

## Department of Electronics and Communication

### 6<sup>th</sup> Sem Mid semester-1

### Syllabus

### Digital Communication (2161001)

Sr.	Topics
1	<b>Base Band Modulation</b> Base band system, sampling theorem, Sampling and signal reconstruction, Aliasing, Types of sampling, Quantization, PCM, Companding, DPCM, ADPCM, Delta modulation, Adaptive delta modulation, T1 carrier system
2	<b>Digital Data Transmission</b> Components of digital communication system, line coding, pulse shaping, Scrambling, Regenerative Repeater, Eye Diagram, Timing Extraction, Detection Error Probability, M-ary communication, Digital Carrier Systems
3	<b>Probability Theory and Random Variable</b> Concept of probability, Conditional probability and independent event, random variable, types of random variable, CDF, PDF, Statistical Averages, Chebyshev's inequality, Central limit theorem, Concept of correlation,

## Antenna & Wave Propagation (2161003)

Sr.	Topics
1	<p><b>Basic antenna concepts:</b>            Definition and functions of an antenna, comparison between an antenna &amp; transmission line, radio communication link with transmitting antenna and a receiving antenna, radiation patterns of antennas-field and power patterns, all antenna types.</p>
2	<p><b>Radiation of Electric dipole:</b>            Potential functions and the electromagnetic field, Oscillating electric dipole derivations for E and H field components in spherical coordinate systems, Power Radiated by a current element, Application to antennas, Radiation from quarter wave monopole and half wave dipoles, Derivation for radiation resistance, application of reciprocity theorem to antennas, equality of directional patterns and effective lengths of transmitting and receiving antennas, directional properties of dipole antennas, antenna feeding methods.</p>
3	<p><b>Antenna parameters and definitions:</b>            beam area, beam width- Half-Power Beam width (HPBW)and First Null Beam width(FNBW) ,Polarisation, Radiation Intensity ,Beam Efficiency, Directivity and directive gain, radiation resistance, radiation efficiency, resolution, Antenna aperture-physical and effective apertures, effective height, transmission formula, antenna field zones, Transmission loss as a function of frequency. Antenna temperature and signal to noise ratio.</p>
4	<p><b>Arrays of point sources :</b>            Expression for electric fields from two, three and N element arrays- linear arrays: Broad-side array and End-Fire array- Method of pattern multiplication Binomial array</p>

# VLSI Technology and Design (2161101)

Sr.	Topics
1	<b>Introduction:</b> Overview of VLSI design methodology, VLSI design flow, Design hierarchy, Concept of regularity, Modularity, and Locality, VLSI design style, Design quality, package technology, introduction to FPGA and CPLD, computer aided design technology.
2	<b>Fabrication of MOSFET :</b> Introduction, Fabrication Process flow: Basic steps, C-MOS n-Well Process, Layout Design rules, full custom mask layout design.
3	<b>MOS Transistor:</b> The Metal Oxide Semiconductor (MOS) structure, The MOS System under external bias, Structure and Operation of MOS transistor, MOSFET Current-Voltage characteristics, MOSFET scaling and small geometry effects, MOSFET capacitances

# Optical Communication (2161005)

Sr.	Topics
1	<b>Overview of Optical fiber Communications :</b> Electromagnetic spectrum, Optical Spectral bands, Evolution of fiber optic system, Multiplexing Techniques, Elements of an optical fiber transmission link with the functional description of each block, WDM concepts, transmission windows, advantages of optical fiber link over conventional copper systems, applications of fiber optic transmission systems.
2	<b>Optical fibers : Structures, Waveguiding and Fabrication :</b> Optical laws and definitions, optical fiber modes and configurations, Mode theory, Step Index and Graded Index (GI) fibers ,single mode and graded index fibers, Derivation for numerical aperture, V number and modes supported by step index fiber, mode field ,Numerical aperture and modes supported by GI fibers, fiber materials, linearly Polarized modes fiber fabrication techniques, and mechanical properties of fibers, fiber optic cables.
3	<b>Signal Degradation in Optical Fibers :</b> Attenuation, signal distortion in optical waveguides, pulse broadening in graded index fiber, Characteristics of Single Mode Fibers, mode coupling, International Standards for optical transmission fibers.
4	<b>Optical Sources :</b> Semiconductor Physics background, Light emitting diode (LEDs)- structures, materials, Figure of merits, characteristics & Modulation. Laser Diodes -Modes & threshold conditions, Diode Rate equations, resonant frequencies, structures, characteristics and figure of merits, single mode lasers, Modulation of laser diodes, Spectral width , temperature effects, and Light source linearity.

# Telecommunication Switching systems and Networks (2161103)

Sr.	Topics
1	<b>Introduction:</b> Evolution of Telecommunications, Simple Telephone Communication, Manual switching system, major telecommunication Networks, Strowger Switching System, Crossbar Switching.
2	<b>Electronic Space Division Switching:</b> Stored Program Control, Centralized SPC, Distributed SPC, Enhanced Services, Two stage networks, Three stage network n-stage networks.
3	<b>Time Division Switching:</b> Time multiplexed Space Switching, Time Multiplexed time switching, combination Switching, Three stage combination switching, n-stage combination switching.
4	<b>Traffic Engineering:</b> Network Traffic load and parameters, Grade of service and blocking probability