The Bombay Salesian Society's

Don Bosco Institute of Technology, Mumbai

(An Autonomous Institute Affiliated to University of Mumbai)

Department of Electronics and Telecommunication Engineering

Syllabus for MidSemester Examination (MSE)

Date: 13 March to 20 March 2026

Time : 10:00 a.m. to 11.30 a.m. **Maximum Marks: 30** **Duration : 1.5 Hrs.**

SE – SEMESTER IV			
Course Code	**Course Name**	**Faculty In-charge**	**Syllabus Content**
25ET4PCC01	Discrete Time Signal Processing (DTSP)	Prof. Shilpa Gaikwad	**Module 1: Discrete Fourier Transform & Fast Fourier Transform** 1.1 Digital Signal Processing System, Difference between Digital and Analog Signal Processing, Converting an Analog Signal to a Discrete Time signal, Concept of Aliasing, Basic Elements of a DSP System, Advantages and Disadvantages of digital and analog signal processing, Definition and Properties of DFT, IDFT, Circular convolution of sequences using DFT and IDFT. 1.2 Filtering of long data sequences: Overlap-Save and Overlap-Add Method for computation of DFT. 1.3 Fast Fourier Transforms (FFT), Radix-2 decimation in time and decimation in frequency FFT algorithms, inverse FFT, composite Radix FFT N=2.3, N=3. **Module 2 : IIR Digital Filters** 2.1 Types of IIR Filters (Low Pass, High Pass, Band Pass, Band Stop), Analog filter approximations: Butterworth, Chebyshev I. 2.2 Mapping of S-plane to Z-plane, impulse invariance method, bilinear transformation method, Design of IIR digital filters (Butterworth and Chebyshev-I) from Analog filters with numerical examples 2.3 Effect of Poles and Zeros on the Frequency Response of IIR filters. **Module 3 FIR Digital Filters** 3.1 Characteristics of FIR digital filters, Minimum Phase, Maximum Phase, Mixed Phase and Linear Phase (Type 1 to Type 4) FIR Filters. 3.2 Design of FIR filters using Window techniques (Rectangular, Hamming, Hanning, and Blackman), Design of FIR filters using Frequency Sampling technique, Comparison of IIR and FIR filters.
25ET4PCC02	Electromagnetics and Antennas (EM&A)	Prof. Freda Carvalho	**Module 1 : Fundamentals of Electromagnetic Theory** 1.1 Review of 4 Maxwell's Equations for static conditions; Concepts of electric and magnetic fields – potential, potential gradient, drift velocity, current density and continuity of current. 1.2 Laplace & Poisson's equation, Electric and Magnetic Boundary Conditions **Module 2: Laplace & Poisson's equation, Electric and Magnetic Boundary Conditions** 2.1 Transformation of Maxwell's Equations for dynamic fields. Generalized EM Wave Equations - Helmholtz equation. Concepts of propagation constant, loss tangent – leading to concept of good dielectric (No derivations), good conductor (No derivations), skin depth. 2.2 Poynting theorem, TEM waves (No derivations). 2.3 Polarization – linear, circular and elliptical polarization (No derivations) **Module 3 Basics of Antennas** 3.1 Radiation mechanism, Near field and far field radiation 3.2 Radiation Pattern, Radiation Power Density, Radiation Intensity, Beam width and half power beam width

25ET4PCC03	Digital VLSI Design (DVLSI D)	Dr. Sudhakar Mande	**Module 1 Review of MOSFET operation and Fabrication** 1.1 Overview of VLSI Design Flow, Review of MOSFET operation, MOSFET Capacitances, MOSFET scaling, Short channel effects, 1.2 Fabrication process flow of NMOS, PMOS and CMOS, Lambda based design rules, 1.3 Performance Metric for VLSI circuit, MOSFET SPICE models and simulation. **Module 2 Combinational CMOS Logic Circuits** 2.1 CMOS inverter operation, Voltage Transfer characteristics (VTC), Noise Margins, Propagation Delay, Power Dissipation, Design of CMOS Inverter, Layout of CMOS Inverter, 2.2 Realization of CMOS NAND gate, NOR gate, Analysis and design of NOR and NAND gates, Equivalent inverter approach, Complex CMOS Logic Circuits, Layout of CMOS NAND, NOR and complex CMOS circuits, 2.3 Fan-in, fan-out and its impact on delay, Design for large Fan-in, Power consumption in CMOS logic gates, Design Techniques to reduce Switching Activity (Dynamic power) **Module 3 MOS Design Logic Styles** 3.1 Static CMOS, Pass Transistor Logic, Transmission Gate, Pseudo NMOS, Dynamic Logic, Issues in Dynamic Design, Domino Logic, NORA, Zipper
25IL4MDM01	Multi-disciplinary Minor (MDM)	DSA: Prof. Kanchan Talekar	**Module 1: Introduction to Data Structures and Algorithms** 1.1 Data Structures concepts: Definition, classification, and need for data structures. Types of data structures: primitive, non-primitive, linear, and non-linear, Abstract Data Types (ADT) 1.2 Concept of algorithms: properties, design techniques, and performance analysis.Asymptotic notation: Big O, Omega, Theta with examples **Module 3: Linear Data Structure – STACKS & QUEUES** 3.1 Introduction to Stack, Stack as ADT, ADT Operations on Stack, Array and Linked List representation of Stack, Applications – Reversing data, Conversion of Infix to prefix and postfix expression. 3.2 Introduction to Queue, Queue as an ADT, operations on Queue, Implementation of Linear Queue, Circular and Priority Queue using arrays and Linked List. **Module 2: Linear Data Structure – LISTS** 2.1 List as an ADT, Array-based implementation
		L&SCM: Prof. Nilesh Gaware	**Module 1:Introduction to Logistics and SCM:**1.1Objectives of a Supply Chain Management, Stages of Supply chain, Value Chain Process, Cycle view of Supply Chain Process, Key issues in SCM, logistics & SCM. 1.2 Supply chain strategies, strategic fit, Best practices in SCM, Obstacles of Stream lined SCM. 1.3 Supplier Selection, Supplier quality audits, Contract management, Non-Disclosure Agreement (NDA), Make & Buy Decision while in-out sourcing. **Module 2: Supply Chain Performance:** 2.1 Bullwhip effect and reduction, Performance measurement: Dimension, Tools of performance measurement, SCOR Model. Global Supply chain-Challenges in establishing Global Supply Chain, Factors that influences designing Global Supply Chain Network. 2.2 Supplier performance measurement – (Delivery & Quality performance, schedule adherence, Goods receipt compliance etc), Supplier Capacity Analysis, Supplier Score card.

		3D Prototyping : Prof. Shreeprasad Manohar	1.1 Introduction to CAD: CAD/CAM In product life cycle, CAD/CAM integration and file formats. 1.2 Geometric Modeling Techniques: Constructive solid geometry (CSG), Boundary Representation (B-Rep), Wire Frame Modeling, Solid Modeling, Surface Modeling, Parametric Modeling (only introduction level), feature-based modeling, Feature recognition, Design by feature AM Processes Classification: SLA Process Fundamentals 2.1 History of AM, classification, and materials. SLA Process Overview, Advantages, Disadvantages, Applications 2.2 FDM Process Fundamentals: FDM Process Overview, Advantages, Disadvantages, Applications.

14/04/2026

Dr. Madhavi S. Pednekar
Head of Department (EXTC)