

## **MEDC – 101 Advanced Mathematics**

### **UNIT I**

Solution of Partial Differential Equation (PDE) by separation of variable method, numerical solution of PDE (Laplace, Poisson's, Parabola) using finite difference methods, Elementary properties of FT, DFT, WFT, Wavelet transform, Haar transform.

### **UNIT II**

Probability, compound probability and discrete random variable. Binomial, Normal, Poisson's distribution. Sampling distribution, elementary concept of estimation and theory of hypothesis, recurred relations.

### **UNIT III**

Stochastic process, Markov process transition probability transition probability matrix, just and higher order Markov process, Markov chain. Queuing system, transient and steady state, traffic intensity, distribution queuing system, concepts of queuing models (M/M/1: Infinity/ Infinity/ FC FS), (M/M/1: N/ Infinity/ FC FS), (M/M/S: Infinity/ Infinity/ FC FS)

### **UNIT IV**

Operations of fuzzy sets, fuzzy arithmetic & relations, fuzzy relation equations, fuzzy logics. MATLAB introduction, programming in MATLAB scripts, functions and their application.

### **UNIT V**

Introduction and definition of reliability, derivation of reliability functions, Failure rate, Hazard rate, mean time t future & their relations, concepts of fault tolerant analysis, Elementary idea about decision theory and goal programming.

### **Reference Books:**

1. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.
2. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.
3. Applied Numerical Methods with MATLAB by Steven C chapra, Tata Mc Graw Hill.
4. Introductory Methods of Numerical Analysis by S.S. Shastri,
5. Introduction of Numerical Analysis by Forberg
6. Numerical Solution of Differential Equation by M. K. Jain
7. Numerical Mathematical Analysis By James B. Scarborough
8. Fourier Transforms by J. N. Sheddon
9. Fuzzy Logic in Engineering by T. J. Ross
10. Fuzzy Sets Theory & its Applications by H. J. Zimmersoms

## **MEDC – 102 MICRO CONTROLLER SYSTEM DESIGN**

### **Unit 1**

Review of 8-Bit and 16-bit microprocessor, support chips and interfacing techniques, single chip micro-computers, architecture, program and data memory, ports, input Output interfacing and programming,

### **Unit2**

Single chip micro controllers- INTEL 8051/ 8751, MOTOROLA 68HC0/68HC11 architecture, instruction set and programming, Memory mapping, addressing modes, Registers, expanded modes. Interrupt handling timing and serial I / O.

### **Unit3**

Software development Modular approach, integrated software development environment, Object oriented interfacing and programming, Recursion and debugging.

### **Unit 4**

ATMEL 89C51 / 52 and PIC micro-Controllers- Case studies.

Design and application of Micro-Controller in Data acquisition, Embedded controllers, Process control etc.

### **Unit 5**

DSP Processor architecture and sample design using TI – DSP.

### **Reference Books:**

1. Embedded Systems 8051 By Majidi & Majidi
2. Design With Micro-Controllers By John P. Peatman Tmh
3. Embedded Micro-Computers System By Jonathan W. Valvano
4. Data Manuals – Intel Motorola

## **MEDC – 103 DSP APPLICATION**

### **MEDC- 103 DSP APPLICATION**

#### **Unit 1**

Review of Discrete time signals: sequences, representation. Discrete time systems: linear, time invariant, LTI systems, properties, and constant coefficients difference equations. Frequency Domain representation of discrete time signals and systems

#### **Unit 2**

Review of Z Transform – Properties, ROC, Stability, Causality, Criterion. Inverse Z Transform, Recursive and Non Recursive systems, Realization of discrete time system

#### **Unit 3**

DFT: Properties, Linear and Circular convolution, Discrete Cosine Transform, Relationship between DFT and DCT. Computation of DFT: FFT/Decimation in Time and Decimation in Frequency

#### **Unit 4**

FIR and IIR systems: Basic structure of FIR and IIR, Bilinear Transformation, Design of Discrete time IIR filter-Butterworth, Chebychev, Inverse Chebychev, Elliptic etc. Design of FIR filters by windowing – Rectangular, Bartlett, Hann, Hamming, Kaiser, Window filter, Design method relationship of Kaiser to other window. Application of MATLAB for Design of Digital filter. Effect of Finite register length in filter Design

#### **Unit5**

Discrete time Random signals: Discrete time random process, Averages, Spectrum Representation of finite energy signals, response of linear systems to random signals. power spectrum estimation: Basic principals of spectrum estimation, estimate of auto covariance, power spectrum, cross covariance and cross spectrum. Advance signal processing technique and transforms: multi rate signal processing- down sampling/up sampling, introduction to discrete Hilberts Transform, Wavelet Transform, Haar Transform etc.

#### **Reference Books:**

1. Discrete time signal Processing by Oppenheim & Schaffer PHI 2<sup>nd</sup> Edition
2. Digital Signal Processing using MATLAB by S.Mitra
- 3 Digital Signal Processing By Proakis Pearson Education
4. Theory & application of Digital Signal Processing by L.R.Rabiner & B. Gold PHI

## **MEDC – 104 VLSI DESIGN**

### **MEDC-104 VLSI DESIGN**

#### **Unit1**

Introduction: Basic concept of integrated circuits and manufacturing, Design fundamental for digital CMOS circuits, Design Abstraction and circuit Validation.

#### **Unit2**

CMOS circuit and Logic Design: CMOS Logic gate design, Basic Physical design, CMOS Logic structure, I/O Structure, Power and Delay consideration

#### **Unit 3**

System Design: CMOS Chip Design, standard cells, Programmable gate array, Design Capture, Simulation and Verification.

#### **Unit 4**

Subsystem Design: Data Operation, CMOS Sub System Design, Memory and Control Strategies, PLA and ROM Implementation

#### **Unit 5**

CAD system and Algorithms: CAD systems, Layout Analysis, Placement and Routing Algorithms, Timing Analysis, Optimization, Logic Synthesis and Simulation, Testability Issues.

#### **Reference Books:**

1. Principal Of Cmos Design: A System Prospective By Waste And Eshraghin
2. Vlsi Design: System On Silicon, Pearson Education
- 3 Vlsi Technology By Sze S.M. Tmh
- 4 Basic Vlsi Design, System And Circuits By Pucknil D.A. Phi
- 5 Vhdl Primer By Bhaskar Star Galax Pub.

## **MEDC – 105 DATA COMMUNICATION AND COMPUTER NETWORK**

### **MEDC-105 DATA COMMUNICATION AND COMPUTER NETWORK**

#### **Unit 1**

Review of synchronous and asynchronous transmission, circuit switching, message switching, packet switching and their comparison, various detector techniques, parity check, vertical and longitudinal redundancy check and CRC code and their error detecting capabilities. RS-232 C and X.21 standards, modern operation, null model.

#### **Unit 2**

Data link control, point-to-point and multi-point links, flow control, sliding window protocol, various ARQ technique for error control and their comparison and performance analysis, HDLC as a bit oriented link control protocol.

#### **Unit 3**

Communication Network:- Virtual circuit and datagram, routing algorithm, dijkstra and Bellman ford least cost, algorithm, various routing protocol, congestion control technique, deadlock and its avoidance.

#### **Unit 4**

Local Area network:- Various topologies and medium access control schemes such as contention, polling, token passing and performance analysis, various IEEE standards for LAN, UBS LANs, FDDI.

#### **Unit 5**

Introduction to WAN packet switching technologies such as ATM and Frame relay.  
Introduction to TCP / IP protocols.

#### **Reference Books:-**

1. Data And Computer Communication By W. Stalling Phi
2. Computer Networks Y Tanenebaum Phi
3. Telecommunication Network, Protocols, Modelings And Analysis By M. Schwartz
4. Local Area Network By Keiser Tmh