B.E. 401 - ENGINEERING MATHEMATICS III

Unit I

Functions of complex variables : Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem , Application of Residues theorem for evaluation of real integrals

Unit II

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi , Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability : Probability Mass function, Probability density function. Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution ,Gamma Distribution ,Beta Distribution ,Testing of Hypothesis |:Students t-test, Fisher's z-test, Chi-Square Method

Reference:

(i)   Numerical Methods using Matlab by J.H.Mathews and K.D.Fink, P.H.I.
(ii)   Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(iii)   Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(iv)   Numerical Methods using Matlab by Yang,Wiley India
(v)   Pobability and Statistics by Ravichandran ,Wiley India
(vi)   Mathematical Statistics by George R., Springer

IT- 402 – COMPUTER SYSTEM ORGANIZATION

Unit I
Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization

Unit-II
Control Unit Organization: Hardwired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Unit-III
Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, 8085 I/O structure, 8085 instruction set and basic programming. Data transfer – Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

Unit-IV
Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

Unit V
Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

References:
1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. J P Hayes, Computer Architecture and Organisations, Mc- Graw Hills, New Delhi
4. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer orgOrganization; TMH
7. Carter; Computer Architecture (Schaum); TMH
8. Carl Hamacher: Computer Organization, TMH

IT- 403 – DATABASE MANAGEMENT SYSTEM

Unit 1
Basic Concepts: DBMS Concepts and architecture Introduction, Review of file organization techniques, Database approach v/s Traditional tile accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and designer. Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database,

Unit 2:
Data models and Relational Databases Various data models, Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models, Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension,

Unit 3:
Structured Query Language Relational Query languages: Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. **SQL**: Data definition in SQL, update statements and views in SQL QUEL & QBE: Data storage and definitions, Data retrieval queries and update statements.

Unit 4:
Database Design Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multi-valued dependencies.

Unit 5:
Advance Concepts: Introduction to: Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery and transaction processing, basic concepts of object oriented data base system and design.

References:
1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Toledo; Data base management systems;TMH
4. Panneeselvam "Database Management System" PHI
5. Date C J, "An Introduction To Database System", Addision Wesley
6. Majumdar ; DBMS; TMH
7. Fundamental of Data Base Management System by Leon & Leon, TMH
8. Oracle 9i Database Administration fundamental – I, volume 1, Oracle Press.

Suggested list of experiments(expandable): -
In this subject the students are supposed to prepare a small database application in complete semester like financial accounting system, Railway reservation system, institute time-table management system, student record system, library management system, hospital management system in RDBMS (preferably ORACLE 9i 10g).

IT- 404 – ANALYSIS DESIGN & ALGORITHM

Unit I
Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, strassen's matrix multiplication.

Unit II
Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm, etc.

Unit III
Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm, etc.

Unit IV
Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.

Unit V
Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniques for trees and graphs (In order, preorder, postorder, DFS, BFS), NP-completeness.

References:
1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. Michael T Goodrich, Robarto Tamassia, Algorithm Design, Wiely India

List of Experiments(expandable):
1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for optimal merge patterns.
6. Write a program for Huffman coding.
7. Write a program for minimum spanning trees using Kruskal's algorithm.
8. Write a program for minimum spanning trees using Prim's algorithm.
9. Write a program for single sources shortest path algorithm.
10. Write a program for Floye-Warshal algorithm.
11. Write a program for traveling salesman problem.
12. Write a program for Hamiltonian cycle problem.

IT- 405 – ANALOG DIGITAL COMM.

Unit-I
Time domain and frequency domain representation of signal, Fourier Transform and its properties, Transform of Gate, Periodic gate, Impulse periodic impulse sine and cosine wave, Concept of energy density and power density (Parseval's theorem), Power density of periodic gate and impulse function, impulse response of a system, convolutions, convolution with impulse function, causal and non causal system impulse response of ideal low pass filter, Correlation & Auto correlation.

Unit-II
Base band signal, need of modulation, Introduction of modulations techniques,Amplitude modulation, Equation and its frequency domain representation, Bandwidth, Power distribution. AM suppressed carrier waveform equation and frequency domain representation Generation (Balance/Chopper modulator) and synchronous detection technique, errors in synchronous detection, Introduction to SSB and VSB Transmission Angle modulation, Frequency and phase modulation equation and their relative phase and frequency deviations, modulation index frequency spectrum, NBFM and WBFM, Bandwidth comparison of modulation techniques.

Unit-III
Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation (PAM), Time division, multiplexing (TDM). Channel Bandwidth for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digital signal, Quantization, Quantization error, Pulse code modulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM (DPCM), Delta Modulation (DM) and Adaptive Delta Modulation (ADM), comparison of various systems.

Unit-IV
Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude shift keying (ASK) Binary Phase Shift keying (BPSK), Differential phase shift keying (DPSK), offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM), MODEM, Introduction to probability of error.

Unit-V
Information theory and coding- Information, entropies (Marginal and conditional), Model of a communication system, Mathematical representation of source, channel and receiver characteristics, Mutual information, channel capacity efficiency of noise free channel Binary symmetric channel (BSC) Binary erasure channel (BEC), Repetition of signal, NM symmetric Binary channel, Shannon theorem, Shanon-Hartley theorem (S/N-BW trade off)Source encoding code properties; Shanon, Fano and Huffman coding methods and their efficiency error control coding, Minimum Hamming distance, Linear Block Code, Cyclic code and convolution codes. Line Encoding: Manchester coding, RZ, NRZ coding.

References:
1. Singh & Sapre, Communication System, TMH
2. Taub & shilling, Communication System, TMH
3. Hsu; Analog and digital communication(Schaum); TMH
4. B.P. Lathi, Modern Digital and analog communication system,
5. Simon Haykins, Communication System. John Willy
6. Wayne Tomasi, Electronic Communication system.
7. Martin S. Roden, Analog & Digital Communication System; Discovery Press.
8. Frank R. Dungan, Electronic Communication System, Thomson/Vikas.

List of Experiments(Expandable)

1. Study of sampling process and signal reconstruction and aliasing.
2. Study of PAM PPM and PDM
3. Study of PCM transmitter and receiver.
4. Time division multiplexing (TDM) and De multiplexing
5. Study of ASK PSK and FSK transmitter and receiver.
6. Study of AM modulation and Demodulation techniques (Transmitter and Receiver) Calculate of parameters
7. Study of FM modulation and demodulation (Transmitter and Receiver) & Calculation of parameters
8. To construct and verify pre emphasis and de-emphasis and plot the wave forms.
9. Study of super heterodyne receiver and characteristics of ratio radio receiver.
10. To construct frequency multiplier circuit and to observe the waveform
11. Study of AVC and AFC.

IT- 406 – DOT NET

UNIT I Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II
Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. **Advanced Features Of C#** Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III
Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. **Windows Forms:** All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV
Understanding and handling controls events, **ADO.NET-** Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader **Data base controls:** Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V XML:
 Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:
1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. **Web** Commerce **Technology** Handbook by Daniel **Minoli**, Emma **Minoli** , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Expandable):
1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.