Computer Fundamentals and Programming
Course CSE 101T

L –P
4– 0

Unit-I

Computer Fundamentals: Computer components, characteristics& classification of computers, hardware& software, peripheral devices, system software, application software, compiler, interpreter, utility program, : Assemblers, Interpreters, Compilers.

Logic Circuits & Computer Architecture, Switching circuits, AND, OR, NOT operations. Interconnection of units, processor to memory communication etc, Bus architecture, virtual memory.

Data Representation: Representation of characters, Integers, fractions. Hexadecimal representation of numbers, decimal –to- binary conversion. Binary Arithmetic, Binary addition, subtraction, two's complement, representation of numbers, addition/ subtraction of numbers in two's complement, binary multiplication and division

Unit-II

Microsoft Windows- An overview of different versions of Windows, Basic Windows elements, File management through Windows. Using essential accessories: System tools – Disk cleanup, Disk defragmenter. Command Prompt- Directory navigation, path setting, creating and using batch files. Drives, files, directories, directory structure. Application Management: Installing, uninstalling, Running applications. Linux- An overview of Linux, Basic Linux elements: System Features, Software Features, File Structure, File handling in Linux: H/W,S/W requirements, Preliminary steps before installation, specifics on Hard drive repartitioning and booting a Linux system. Basic shell commands.

Unit-III

Programming Language Classification & Methodology: Introduction to Computer Languages, Generation of Languages, Flow Charts, Dataflow Diagram Translators

Introduction to C Programming: Engineering problem solving methodology, computer languages, History of C, High-level languages, A simple C Program.

C-Programs: Program structure, constants and variables, scientific notation, memory concepts, Assignment statements.

Steps in Programming: Numeric data types, symbolic constants, arithmetic operators, priority of operators, Mathematical functions.

Unit IV

Making Decisions: The decision making process, Arithmetic comparisons, logical expressions, Algorithms, Pseudo-code, control structures. *If* Selection structure, *if/else* Selection structure, *while* repetition structure, formulating Algorithms, Assignment operators, Nested *If* statements.

C Program Control: Essentials of Repetition, Counter-Controlled Repetition, *for* repetition structure, *for* structure, *Switch* multiple-selection structure. *Do/while* repetition structure, *break* and *continue* statements, logical operators.

Unit-V

Functions: Program modules, Math library functions, Functions, Function definition and prototypes, header files, calling functions, random number generation, recursion.

Arrays and Matrices: Programs without arrays, using arrays, arrays and addresses, multi-dimensional arrays, storing arrays, searching arrays

Books Recommended

1. Fundamentals of Computers, V. Rajaraman, Prentice-Hall, 2006 edition.
2. Let us C, Yashavant kanetkar, BPB Publications

Reference Books

1. Fundamentals of Information Technology, Alexis Lean & Mathews Leon, Vikas Publishing house
2. Introduction to computers, Alexis Leon & Mathews Leon, Vikas publishing House.
3. *C How to Program*, Deitel & Deitel, Prentice hall
4. *Programming in ANSI C*, E. Balagurusamy, Tata McGraw Hill
5. Introduction to Computer Science, ITL ESL, Pearson Education.
6. Linux: The Complete Reference, Sixth Edition by Richard Petersen

Physics-I
CSE-102T

L – P
4 – 0

Unit-I

Vector Analysis, Rotation of coordinate axis and transformation of vectors, Gradient of scalar field, divergence and curl of vector field in Cartesians, spherical polar and cylindrical coordinate systems, Gauss's divergence theorem, Stokes's theorem

Unit-II

Collision of particles, Conservative and non-conservative forces, elastics and inelastic scattering, frames of references, laboratory and center of mass system, kinematics of elastic scattering in laboratory system, application of conservation theorem in solving collision and scattering problems.

Unit-III

Vibration and Acoustics, Differential equation of simple harmonic motion, energy of simple harmonic oscillator, damped harmonic motion, energy dissipation, forced oscillations, amplitude and velocity resonance, sharpness of resonance, energy consideration in forced oscillations

Unit-IV

Electromagnetic Theory: Coulombs law and Gauss's theorem, calculation of electric field and potential, Biot -Savart's law, Ampere's theorem, divergence and curl of magnetic field, Faraday's law

Unit-V

Maxwell's equation, electromagnetic wave equation in free space, its solution in one dimension and discussion, energy and momentum in electromagnetic wave, Introduction to plasma: Debye shielding, plasma parameter, plasma frequency

Books Recommended

1. Introduction to classical Mechanics by R.G.Takwale and P.S Puranik (Tata McGraw Hill publishing Co.)
2. Classical Mechanics by N.C. Rana and P.S. Jog (Tata McGraw Hills)
3. Introduction to Electrodynamics By David Griffiths (Pearson Education)

4. Introduction to Plasma theory by Dwight R. Nicholson (John Wiley)
5. Vibrations and Waves by A.P French, 1996

Chemistry-I
CSE 103T-

L P
4 0

Unit-1 CHEMICAL THERMODYNAMICS

Introduction and Importance, Concept of Heat and Work, State Functions and Path Functions. First Law of Thermodynamics,Work done in Isothermal and Adiabatic Conditions. Heat capacities, Relation between Cp and Cv relations, Second Law of Thermodynamics, Concept of Entropy, Gibbs free energy. Free Energy Changes as Criteria of Reversible and Irreversible process, Gibbs-Helmholtz's equation, Clausius- Clapeyron equation.

Unit-II ELECTROCHEMISTRY

Introduction, Conductivity of Electrolytes, Kohlrausch's Law of Independent Migration of Ions and its Application, Debye Huckel Theory of Strong Electrolytes. Electrochemical cells, Electrode-Potential, Standard Electrode Potential, Types of Electrodes (Metal-Metal Ion electrode, Gas Electrodes, Metal Insoluble Metal Salt Electrode), Fuel Cells, Hybrid cells, pH: Measurement and Control

Unit-III GENRAL ORGANIC CHEMISTRY

Introduction, Electronic Displacements in Organic Molecules, Reaction Intermediates, Types of Organic reaction (Addition, Elimination, Substitution, and Rearrangements Reaction).
Isomerism: Structural Isomerism, Geometrical isomerism, E/Z system of Nomenclature, Chirality, Optical isomerism, Optical Activity without Chirality

Unit-IV ALLOYS

Introduction To Alloys, Advantages of Alloys over other Metallic Materials, Manufacturing of Alloys (Fusion Method, Powder Metallurgy, Electrodeposition and Reduction method), Classification of Alloys (Ferrous and non-Ferrous metal Alloys), Carbon steels (Carbon Steels Classification, Composition and Uses), Alloy Steels (Low, Medium and High alloys steels), Effect of Different Alloying Elements on Properties of Alloy steels, Engineering Application of Copper, Nickel and Aluminum Alloys

Unit V INSTRUMENTAL TECHNIQUES I

Introduction, Advantages and Disadvantages of Instrumental and Non-Instrumental Methods, Electromagnetic Radiation, Electromagnetic Spectrum, Light Absorption (Beers-Lambert Law)
Infrared Spectroscopy (Modes of vibration, IR bands corresponding to different functional groups and Applications), UV-VIS spectroscopy (Types of Transition, Chromophors, Auxo-chromes and Applications)

Books Recommended:

1. J.C. Kuriacose and J. Rejaraman: Chemistry in Engineering and Technology Volumes I & II (Tata McGraw Hill publishing company Limited, New Delhi)
2. P.C. Jain. Engineering Chemistry, (DhanpatRai& Sons, NaiSarak; New Delhi).
3. Physical Chemistry – Puri Sharma and Patharua.
4. Inorganic Chemistry (J.D. Lee).
5. Physical Chemistry by Peter Atkins,Juliodepaula
6. Electrochemistry and Corrosion Science by N.Perez
7. A Textbook of Organic Chemistry, V. K. Ahluwalia and MadhuriGoyal

8. Organic Chemistry: Stereochemistry, I. L. Finar, Pearson Education

Reference Books:

1. C.V. Agarwal - Chemistry of Engineering Materials (Tata publishing Works, Varanasi)
2. L.A.Munro – Chemistry in Engineering (Prentice Hall, New York)
3. Chemistry of Engineering Materials, C.P. Murthy, C.V. Agarwal and A. Naidu BS
4. O.P.Vermani and A.K. Narula – Applied Chemistry Theroy and Practive, (Wiley Eastern Limited, New Delhi).
5. R. M. E. Diamand: Applied Chemistry for Engineers, (Pitman)

Mathematics-I
CSE 104T

L – P
4 – 0

Unit-I

Introduction to differential calculus, Leibnitz's Theorem for n^{th} derivative, Taylor's theorem, Tangent and Normal, Partial Differentiation, Euler's theorem,Double points, asymptotes, curvature and tracing of curves.

Unit-II

.

Limit, continuity and differentiability of functions of several variables, Chain rule, Jacobi theorem.Taylor's theorem of one and two variables, extrema of functions, two or more variables using method of Lagrange's multipliers.

Unit-III

,

Ordinary differential equations: Exact ordinary differential Equations and Ordinary differential equations reducible to exact differential equations. Linear differential equations and equations reducible to linear form.Linear Differential equations of second and higher order with constant and variable coefficients.

Unit-IV

Non-linear differential equation of first order, Simultaneous differential equation, Simultaneous differential equation of the form $dx/P = dy/Q = dz/R$, Applications of ordinary differential equations,

Unit-V

Algebraic Equation, Elements of the theory of polynomial equations.
Fundamental theorem of Algebra, Relation between the roots and the coefficients of an equation, Solution of cubic & bi-quadratic equations

Books Recommended

1. Differential calculus, Shanti Narayan, S.Chand

2. A text Book on Engineering Mathematics by Bali, N.P, Luxmi Publications
3. Ordinary and Partial Differential equation, M.D.Raisinghania, S.Chand and Co

Reference Books

1. Advanced Engineering Mathematics by Jain, R.K. and Iyengar SRK, Narosa, 2001
2. Advanced Engineering Mathematics, Kreyszig, J.Wiley
3. Linear Algebra, Hoffmann &Kunze, Prentice-Hall
4. Differential equations and its applications, H.T.Piaggio, Prentice-Hall
5. Engineering mathematics Vol I-II, Sastry, Prentice Hall of India

Engineering Drawing
CSE -105T-

L - P
2- 3

UNIT I

Basic Concepts of drawing quadrants, drawing instruments, types of lines etc.
Dimensioning: General rules of dimensioning. Types: Aligned, unidirectional, chain, parallel, combined, title, block & margins.
Orthographic projections: Concept of horizontal and vertical planes, first and third angle projections, orthographic projections of simple blocks, missing lines and missing views.
Projection of points, lines and planes: Projection of points in different quadrants, projection of lines and planes positioned in different orientations with respect to the principle planes.

UNIT II

Projection of solids: Projection of simple geometrical solids placed in simple positions and with single rotations of the face, edge or axis of the solid with respect to one of the principal planes of projection.

UNIT III

Section of solids: Principal of sectioning, Section of simple geometrical solids, types of the section planes and their trace representation and location, true shape sections, sectioning by auxiliary planes.

UNIT IV

Development of surfaces: Development of surfaces of simple sectional solids and intersecting solids, transition pieces, cones & cylinders.

UNIT V

Isometric projections: Classification of pictorial projections, Isometric projection of plane figures, prisms, pyramids, cylinders and for the given orthographic projections. Introduction to Auto CADD.Basic commands of CADD.

Books Recommended :

1. Gill, P.S Engineering Drawing, S.K. Kataria and sons,
2. Bhatt, N.D Enginnering Drawing, Charotar Book Stall, TulsiSadan, Anand
3. James, D Bethune Engineering Graphics with Auto CADD, 2006.
4. Narayana, Kannaiya Engineering Drawing, Scitech Publications, Chennai

Reference Books

1. Sham Tickoo, Auto CADD 2006
2. B.C.RanaM.B.Shah Engineering Drawing, Pearson Education

Computer Fundamental and Programming Lab
CSE 106P

L – P
0 – 2

1. Familiarization with DOS environment and its important commands
2. Learning some configuration commands & creating batch files in DOS environment
3. Understanding network sharing and working with Windows utilities
4. An Introduction to Linux
5. Working with MS Office 2010
6. Learning basics of Microsoft Word
7. Exploring the advanced features of Microsoft Word
8. Working with Microsoft Excel
9. Familiarization with the environment of Microsoft Power Point
10. Creating databases using Microsoft Access
11. Creating queries, forms and reports in Microsoft Access
12. Creating a hard copy of the crucial CMOS boot configuration and restoring CMOS boot configuration when lost
13. Experimenting with the AND, OR, NAND, NOR, XOR and NOT Integrated circuits
14. Finding expression for the given logic diagram, implementing the circuit on breadboard, and observing output for various combinations of inputs
15. Demonstrating various components of a PC and their interconnection
16. Internet Basics and Networks Media
17. Internet basics
18. Familiarization with various network cables and their accessories
19. Program to print “Hello World”.
20. Program to add, subtract, multiply, divide and find remainder between two numbers.
21. Program to check whether three numbers are equal or find the largest and smallest of the three using if-else.
22. Develop a menu-based calculator using switch.
23. Program to generate odd, even, fibnoccii, lucas and other common series using loops.
24. Program to develop a menu-based grade card using do-while and use continue and break statements.
25. Write functions for finding sum, difference, product and remainder between two numbers and return the result.
26. Write a function to find factorial using recursion.
27. Programs to find minimum, maximum of an array.
28. Program to implement linear search and selection sort.
29. Program to add and multiply two matrices.
30. Program to find transpose of a matrix.

Physics- I Lab
CSE 107 P

L – P
0 – 2

1. To determine the value of e/m of electron
2. To study the bar pendulum
3. To study the Kater's reversible pendulum
4. To study the bending of beam apparatus
5. To study the Newton's ring apparatus
6. To determine the wavelength of light using a spectrometer
7. To study a Polarizer and analyzer
8. Stephens constant using incandescent lamps
9. Energy band of a semi-conductor diode

Recommended Books:

1. Practical Physics by SL Gupta,
2. Advanced Practical Physics, SP Singh, Pragati Prakashan

Weekly Laboratory Schedule

Week 1-2	To determine the value of e/m of electron
Week 3.	To study the bar pendulum
Week 4	To study the Kater's reversible pendulum
Week 5.	To study the bending of beam apparatus
Week 6-7.	To study the Newton's ring apparatus
Week 8-9.	To determine the wavelength of light using a spectrometer
Week 10.	To study a Polarizer and analyzer
Week 11-12.	Stephens constant using incandescent lamps
Week 13-15.	Energy band of a semi-conductor diode
Week 16	Project Presentation
Week 17	Final Exam and Viva

Chemistry Lab-I
CSE108P

L P
0 2

List of Experiments

Basic Introduction on Solution Preparation, Concentration terms, Handling of Glass wares Chemicals and Instruments, Precautions

1. Determination of strength of NaOH solution by standardization of sodium hydroxide using Oxalic acid
2. To determine the acid value of a given mineral oil or vegetable oil.
3. To determine the moisture content of a given sample of coal.
4. To determine the Degree of dissociation of a weak acid by Conductometry
5. To determine the ash content of a given sample of coal.
6. Determination of the strength and pK_a value of the weak acid by titration with a alkali.
7. Estimation of calcium in Lime stone
8. To determine the Aniline point of the given sample of a Lubricating oil
9. To determine the flash and fire point of given oil by Pensky-Martins flash point apparatus.

Demonstration Experiments

1. Determination of pH of different concentration of acid and bases by pH meter
2. Determination of calorific value of solid fuels using Bomb Calorimetery

Engineering Workshop
CSE -109 P -

L – P

0– 3

1. **WOOD AND WOOD WORKING (CARPENTRY):** Various types of wood, defects in timber, seasoning of wood, carpentry tools and measuring devices. Common safety in wood working. Exercises on carpentry processes like marking, sawing, planning, and chiseling. Exercise for wood working joints, like Halved joints, Dovetail joints, Mortoise and Tenon joints.
2. **MACHINE SHOP:** Introduction to Machine tools, like lathes, shapers, drilling machines, sawing machines, grinding machines & milling machine with their uses; principal parts and accessories. Types of cutting tools, materials. Simple and basic metal removal operations on machines such as lathes, milling machine, shaper, grinder & drilling machines using mild steel. Safety precautions of machine tools. Introduction to CNC lathe.
3. **WELDING SHOP:**Introduction to welding applications & methods, welding equipments& electrodes. Edge preparation and simple arc- welding operations on M.S for joints like lap, butt, corner, edge & T-joint. Safety measures. Welding defects.
4. **FITTING SHOP:** Description of fitting and cutting tools like clamping tools i e vices, measuring & marking tools, calipers, vernier calipers, micrometers, dial indicators, gauges,hacksaw,files,strikingtools,chiseles, drills, taps, reamers, Die & die stock. Demonstration of above tools through simple operations on M.S pieces.
5. **BLACK SMITHY SHOP**: Description of supporting, holding, striking, cutting & forming/finishing tools. Heating devices and measuring tools. Simple hand forging operations like drawing down, cutting, jumping and bending. Safety precautions.
6. **FOUNDRY SHOP:** Description of foundry tools &equipments like, hand tools, moulding boxes (flasks), moulding machines, simple melting and pouring (ladles) equipments. Introduction to moulding, moulding sands, types of moulds& cores . Making of simple sand mould with core and casting.
7. **SHEET METAL SHOP :** Demonstration of Sheet metal tools for measuring, working tools like scribers,punches,chisels,snips,hammers,stakes& holders, pliers, groovers, folding bars & gauges. Simple operations like measuring& marking, lying out, cutting, shearing, bending stretch forming, riveting. Lancing, notching.Introduction to hems and seam.

Books recommended

1. Raghuvanshi , B.S; A course in workshop technology, Vol I -II. DhanpatRai and Sons
2. Garg S.K Workshop Technology (Manufacturing Processes) Laxmi Publications (P) LTD.
3. Hajirachowdry, Workshop Practice
4. Singh, S; Manufacturing Practice, S.K. Kataria and Sons , New Delhi

SYLLABUS FOR 3RD SEMISTER

Communication System
CSE 301T

L - P
4- 0

Unit-I

Benefits of communication technology, Block diagram of a general communication system. Analog and digital communication, Modulation, Need for modulation. Signal Spectrum: fourier series analysis of periodic signals, Fourier transform. Amplitude Spectrum of signals, power spectrum of signals.

Unit-II

Amplitude modulation (AM): definition, AM modulation index, spectrum of AM signal, power analysis of AM signal, Standard AM generation, Detection using envelop detector. DSB/SC-AM, Vestigial Side band A M signal (Brief ideas). Frequency division multiplexing.

Unit-III

Frequency modulation (FM): Basic definition, Frequency modulation index, Carson Bandwidth of FM signal, Narrow band and broad band FM signal. Generation of FM, Detection of FM

Unit-IV

Digital communication: Advantages, sampling theorem, quantization, quantization error, SNR due to quantization, Pulse code modulation, Time Division multiplexing. Digital modulation techniques: ASK, FSK. PSK, M-ary PSK, QAM. Modem

Unit-V

Introduction to Secure Message Communication, Active and Passive Attacks. Encryption techniques, spread spectrum systems (basic Idea). PN-sequences (m-sequences). Definition of noise, sources of noise, Noise power, White noise, Band limited white noise, signal to noise ratio, SNR of base band communication system, SSB, DSB/SC, Standard-AM, SNR of FM, Noise figure, Relative performance.

Books Recommended:

1) Principles of communication system, Taub and Schilling, Mcgraw Hill, 3rd Ed.
2) Communication system; Analog and Digital, Sanjay Sharma
3) Modern Analog and Digital Communication system by Lathi
4) Communication System by Simon Hykin
5) Electronic Communications, Roody- Coolan, PHI

6) Electronic Communication Systems(Fundamentals through advanced), W. Tomassi, Pearson Education

Data Base Management System
CSE-302T

L P
4 0

UNIT 1

Basic Concepts and Conceptual Database Design: Database Users, Characteristics of the Database, Database Systems, Data Models, DBMS Architecture & Data Independence, Database Languages & Interfaces. Overview of Hierarchical, Network & Relational Data Base Management Systems. Data Modeling Using The Entity-Relationship Model – Entities, Attributes and Relationships, Cardinality of Relationships, Strong and Weak Entity Sets, Generalization, Specialization, and Aggregation, Translating your ER Model into Relational Model.

UNIT 2

Relational Data Base Design and Oracle Architecture: Functional Dependencies & Normalization for Relational Databases, Functional Dependencies, Normal Forms, Lossless Join & Dependency, Preserving Decomposition, Database Storage, Oracle Software Structures, Shared Database Access Mechanism, Database Protection. Case Study – ORACLE.

UNIT 3

Relational Model, Languages & Systems: Relational Data Model, Relational Model Concepts, Relational Model Constraints, Relational Algebra, SQL – A Relational Database Language, Data Definition & Manipulation in SQL, View and Queries in SQL, Specifying Constraints and Indexes in SQL, Practicing SQL commands using ORACLE. Case Study – ORACLE. Brief introduction of PL-SQL

UNIT 4

Transaction Management: Transaction Concept and State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Concurrency Control Techniques: Lock-Based Protocols, Timestamp-based Protocols, Validation–based Protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Recovery System, Failure Classification, Storage Structure. Recovery and Atomicity: Log-based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Nonvolatile Storage

UNIT 5

Advanced Recovery Techniques, Remote Backup Systems. Indexing, Hashing and Query Processing: Query Processing, Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions, Concepts of Object Oriented Database Management Systems, Distributed Data Base Management Systems.

REFERENCE BOOKS:

1. Korth, Silberschatz, “Database System Concepts”, TMH
2. Steve Bobrowski, “Oracle 8 Architecture”, TMH

3. Date C. J., “An Introduction to Database Systems”, Narosa Publishing
4. Elmsari and Navathe, “Fundamentals of Database Systmes”, A. Wesley
5. Ullman J. D., “Principles of Database Systems”, Galgotia Publications
6. William Page, “Using Oracle 8i – Special Edition”, Que/PHI
7. Ivan Bayross, ”SQL & PL/SQL Using Oracle 8i & 9i with SQLJ”, BPB
8. Desai.B, "An introduction to Database Concepts", Galgotia Publications

Digital Electronics & Logic Design
CSE-303T

L- P
4- 0

UNIT-I: Number Systems and Codes

Binary, octal, and hexa- decimal number systems, binary arithmetic, binary code, excess-3 code, gray code, error detection and correction codes. Boolean algebra: Postulates and theorems, logic functions, minimization of Boolean functions using algebraic, Karnaugh map and Quine – McClausky methods, realization using logic gates.

UNIT-II: Combinational Circuits

Introduction to combinational circuit: Realization of basic combinational functions like Adder / Subtractor, Encoder / decoder, Multiplexer /Demultiplexer, Comparators, Delays and hazards in combinational circuits.

UNIT-III: Sequential Circuits

Flip-Flops - SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis of clocked sequential circuits - their design, State minimization, state assignment, Circuit implementation, Registers-Shift registers, Ripple counters, Synchronous counters, Timing signal.

UNIT-IV: Logic Families

RTL, DTL, TTL, ECL, ICL, HTL, NMOS & CMOS logic gates, Circuit diagram and analysis characteristics and specifications, tri-state gates.

UNIT-V: Digital Hardware Devices/Data Converters

Analog to Digital converters, Digital to Analog converters, Programmable Logic Devices. (PLD’s)

Books Recommended:

1. Morris Mano, “Digital logic and Computer Design ", Prentice-Hall of India.
2. Ronald J. Tocci, “Digital Systems, Principles and Applications”, Prentice-Hall of India.
3. Jain R.P., “Modern Digital Electronics ", Tata McGraw Hill.

4. Floyd T.L., “Digital Fundamentals ", Charles E. Merrill Publishing Company.

Data Structure
CSE-304T

L - P
4 - 0

UNIT 1:
Introduction to data structures, classification of Data Structures, Primitive vs. Non Primitive, Linear vs Non Linear, Structure & Problem Solving, Primitive Data Structures Operations, Recursion Function & its Examples. String Manipulation, String Matching Techniques & Applications.

UNIT 2:
Concept of Stack & Queue, Singly & Doubly – Linked Lists, Circular Linked List, their Implementation & Comparison, Array Based & Linked List Based Implementation of Stack & Queue & their Applications.

UNIT 3:
Searching: Sequential & Binary Search on Array-based Ordered Lists, Binary Trees, their Implementation & Traversal, Binary Search Trees: Searching, Insertion & Deletion of Nodes, Height Balance & Concept of AVL Trees, Concept & purpose of B- Trees & B+ -Tree.

UNIT 4:
Concept Of Hash Functions, Hash-tables & Hashing with Chaining, Sorting Techniques: Insertion Sort, Selection Sort, Quick Sort, Heap Sort, External Sorting-Way Merge Strategy.
File Structure: Sequential Files, Indexed Files, Direct Files.

UNIT 5:
Graphs: Definition, Terminology & Representation using Adjacency Matrix & Linked List. Shortest Path Algorithms & their Implementations, Graph Traversals: BFS & DFS algorithms & their Implementations.

BOOKS RECOMMENDED:

1. Shams outline series “Data Structures”
2. Langsam Augenstein Tenenbaum “Data Structures ucing C and C++”

REFERENCE BOOKS :

1. Tremblay & Sorenson , "An Introduction To Data Structures With Applications" , McGraw hill, Kongakusha
2. Horowitz Sahni Mehta , "Fundamentals of Data structures", SBCS Publication

Mathematics-III (Discreet Mathematics, Laplace & Fourier Transform)
CSE 305T

L P
4 0

Unit-I

Sets, Partition of set, Relations, Equivalence relation & Partially Ordered Sets (POSET) with examples, Lattices. Logic: Propositional Logic, Predicate Logic, Principle of Induction with examples, Recurrence Relations, Bolean Algebra.

Unit-II

Groups: Function & Binary Operation. Definition of Moniod, Semi Group & Group with Examples, Order of Group. Sub Groups & Cosets, Langrage Theorem. Order of element, Cyclic Groups with examples.

Unit-III

Graphs: Edges & vertices, Degree of Vertex, Homomorphism & Isomorphism of Graphs, Euler Paths & Circuits, Hamiltonian Paths & Circuits, Trees, Rooted tree, Binary trees, Spanning Trees, Coloring & Planner Graphs.

Unit-IV

Laplace transform & Inverse Laplace transforms: Definition, Shifting theorem, Laplace transforms of different functions, Heaviside's unit function, Dirac Delta function and its Laplace transforms, Heaviside's expansion theorem(Statement only), Initial and final value theorems, convolution theorem and applications, use of Laplace transforms in the solution of linear differential equations.

Unit-V

Bessel's functions, Recurrence relations, modified Bessel's function of first kind.
Legendre polynomials, Rodrigues formula, Recurrence relations.
Definition of Fourier transform, Fourier Sine and Cosine transform Fourier integral formula and applications. Z-trasforms and their applications.

Recommended Books:

1. Discrete Mathematics by Seymour Lipschutz, Schaums Outlines
2. Essential of Discreet Mathematics by David J. Hunter, Published by Jones & Barlet.
3. Topics in Algebra by I. N. Heirstien, Wiley & Sons
4. Modern Algebra by Surjeet Sigh & Quazi Zameer-Ud-Dine
5. Laplace Transforms by Spiegel (Schaum Series)
6. The use of Integral Transforms by Iam.N.Snedden, Tata McGraw Hill
7. Advance Engineering Mathematics by R.K.Jain & S.R.K. Iyengen-Norosa-2001.

8. A Students Guide to Fourier Transform by John Francis James

COURSE SCHEDULE:

Week 1	**Unit-I:** Laplace transform, Shifting theorem, Laplace transforms of different functions, Heaviside's unit function,
Week 2	Dirac Delta function and its Laplace transforms, Heaviside's expansion theorem.
Week 3	**Unit-II:** Inverse Laplace transforms, Initial and final value theorems, convolution theorem and applications,
Week 4	use of Laplace transforms in the solution of linear differential equations.
Week 5	**Unit-III:** Bessel's functions, Recurrence relations, modified Bessels function of first kind.
Week 6	**Mid term I**
Week 7-8	Legendre polynomials, Rodrigues formula, Recurrence relations.
Week 9-10	**Unit-IV:** Definition of Fourier transform, Fourier Sine and Cosine transform, Fourier integral formula.
Week 11	**Unit-V:** Discrete Mathematics: Group, partial orders, Lattics Group theory: Connectivity, trees, spanning trees, colouring, planarity, Isomorphism.
Week 12	**Mid Term II**
Week 13	harmonic conjugate,
Week 14-15	conformal transformation of some simple functions.
Week 16	Revision
Week 17	**Final Examinations**

Basic Electrical Engineering
CSE - 306T-

L – P
4 – 0

Unit-I

Electric Circuits Laws: Basic electric circuit terminology, Ohm's law, Kirchhoff's current law (KCL) and Kirchhoff's Voltage law (KVL) , circuit parameters (resistance, Inductance and capacitance), series and parallel combinations of resistance, Inductance and capacitance , Nodal analysis.

Unit-II

Energy Source, Ideal and Practical voltage and current sources and their transformation, Dependent voltage sources and dependent current sources, D.C. Circuit Analysis, Power and energy relations, Analysis of series and parallel DC circuits,

Unit-III

Loop and Nodal methods of circuit analysis, Superposition theorem, Thevenin's and Norton's theorems, maximum Power theorem, Delta - star (Y) Transformation

Unit-IV

A.C. CIRCUIT ANALYSIS: Basic terminology and definitions, Phasor and complex number representation, solutions of sinusoidally excited RLC circuits, Power and energy relations in A.C. circuits, Applications of network theorems to A.C. circuits, Resonance in series and parallel circuits, Concepts of active & reactive powers.

Unit-V

Steady State A.C three phases Circuits:, Concept of a 3-phase voltage, wye (Y) circuits. Delta (Δ) circuits, Current and voltage relations in Y and Δ Circuits, Characteristics of a 3 -phase system, Magnetically Coupled circuits, Mutual inductance

Books Recommended

1. Fundamentals of Electric Engineering by Bogart , Tata McGraw Hill,1998
2. Electrical Engineering Fundamentals by Deltoro, Prentice Hall India (PHI)
3. Theory and problems of Basic Electric engineering by Nagrath and Kothari..PHI
4. Basic Electric Engineering by Cathey, Schaum's outline series, Tata McGraw Hill
5. Circuit analysis by William Hayat, Tata McGraw Hill, 2nd Ed

Data Base Management Systems Lab
CSE 307P

L	P
0	2

SQL Data Definition and Data Types.
Specifying Basic Constraints in SQL.
Schema change statements in SQL.
Insert, Delete and Update Statements in SQL.
Basic Queries in SQL.
Joining Multiple Tables : Inner Joins , Outer Joins ,Cross Joins.
Correlated and Nested Queries in SQL.
Implement all the operation like Union, Intersect, minus, in, exist, aggregate and Statistical functions . Group By And Having clause.
Creating Views, Writing Assertions.

PL/SQL

PL/SQL data Types ,Control Structures, Logical Operators(And, Not, Or), Relational Operators(IS NULL, Like, Between , In etc).
Built in Functions.
Functions and procedures.
Cursors , Collections and records.
Packages and Triggers.
Error handling .
Oracle administration
Creating FORMS
Generating REPORTS.

Data Structure Lab
CSE 308P

L	P
0	2

1. Implementation of stack and queue using Array and linked list.
2. Applications of stack like Tower of Hanoi , Conversion of Infex Expression to polish notation, Conversion of Polish Expression to Code.
3. Implementation of single and doubly linked list and various operations on them.
4. Applications of Linked List Polynomial Manipulation.
5. Circular Linked List.
6. Sorting techniques- Bubble sort, Selection sort ,Insertion Sort, Merge Sort, Quick Sort, Radix Sort ,Bucket Sort, Heap Sort.
7. BST and its implementation.
8. Heap and its implementation.
9. Hashing and its Implementation.

10. Graphs and their Representation using Array and Linked List.
11. BFS and DFS of Graph.

Digital Electronics and Logic Design Lab
CSE-309P

L P
0 2

SOFTWARE LAB

Design with VHDL

Introduction to VHDL: Defining modules in VHDL, Structural modeling, Data flow models, Behavior models. Design of digital circuits using VHDL, VHDL programming

HARDWARE LAB

1. To verify the truth table of the following logic gates:
    - AND, OR, NOT
    - NAND, NOR, XOR, XNOR
2. Realization of :
    - Half Adder and verify its truth table
    - Full Adder and verify its truth table
    - Half subtractor and verify its truth table
    - Full subtractor and verify its truth table
3. To design multiplexer and demultiplexer using 2-input NAND gates.
4. Realization of :
    - Flip-Flops
    - Ripple Counters

Communication System-I Lab
CSE 310P

L P
0 2

List of Experiments:

1. To realize Amplitude Modulation (AMDSB-FC) & Demodulation
2. To realize Amplitude Modulation (AMDSB-SC) & Demodulation
3. To realize Amplitude Modulation (AMSSB-FC) & Demodulation
4. To realize Frequency Modulation (FM) & Demodulation
5. To realize Pulse Amplitude Modulation (PAM) & Demodulation
6. To realize Pulse Width Modulation (PWM) & Demodulation
7. To realize Pulse Position Modulation (PPM) & Demodulation
8. To realize Pulse Code Modulation (PCM) & Demodulation
9. To generate a PN-Code Sequence using 3-stage shift register using JK flip flops
10. To implement Scrambler and De-scrambler

Basic Electrical Engineering Laboratory
CSE -311P

L – P

0 – 3

List of Experiments

Experiment No: 1

To study the color coding of resistors.
Connection of Ammeters, voltmeters, Wattmeter's and Millimeters in DC and AC circuits and selection of their ranges.
Use of LCRQ meter.

Experiment No: 2

To study the series and parallel operation of resistors and verifying their effective values by LCRQ meter.
b) Repeat the same for inductors.
c) Repeat the same for capacitors.

Experiments on D.C. Circuits:

3. To verify the KVL and KCL in D.C. circuits.
4. To verify the star delta transformation of networks.
5. To verify the superposition theorem.
6. To verify the maximum power transfer theorem.
7. To verify Norton's Theorem.
8. To verify Superposition Theorem.

Experiments on A.C. Circuits:

9. To measure electric power in single phase AC circuits with resistive load, RL load and RLC load.
10. To measure the power and power factor in three phase AC circuits.
11 To study the series resonance.

12. To study the parallel resonance.

SYLLABUS OF 5TH SEMISTER

Object Oriented Programming and System Design
CSE-501T

L	P
4	0

Unit-I

Object Modeling
Object & classes, Links and Associations, Generalization and Inheritance, Aggregation, Abstract classes, A sample object model, Multiple Inheritance, Meta data, candidate keys, constraints.

Unit-II

Dynamic Modeling
Events and States, Operations and Methods, Nested state Diagrams, Concurrency, Relation of Object and Dynamic Models, advanced dynamic model concepts, a sample dynamic model.
Functional Models, Data flow Diagrams, Specifying Operations, Constraints, a sample functional model.

Unit-III

Programming in C++
Limitations in structured programming-Characteristics of Object Oriented Language, Classes and objects in C++, Functions, Constructors, Destructors,

Unit-IV
Inheritance, Functions overloading, Operator Overloading, I/O Operations. Real life applications, Extended Classes, Pointer, Virtual functions, Polymorphisms, Working with files, Class templates, Function templates.

Unit-V

Translating object oriented design into an implementation, OMT Methodologies, examples and case studies to demonstrate methodology, comparison of Methodology, SA/SD, and JSD.

Books Recommended:

1. Rambaugh James etal, Object Oriented Design and Modeling , PHI-1997
2. Bjarne Stroustrup, C++ Programming Language , Addison Wesley
3. Balagurusamy E, Object Oriented Programming with C++ , TMH, 2001
4. Booch Grady, Object Oriented Analysis and Design with application 3/e , Pearson
5. Lipman, Stanley B, Jonsce Lajole, C++ Primer Reading , AWL, 1999
6. Dillon and Lee, Object Oriented Conceptual Modeling , New Delhi PHI-1993

7. Stephen R. Shah, Introduction to Object Oriented Analysis and Design , TMH
8. Berzin Joseph, Data Abstraction: the object oriented approach using C++ , McGraw Hill
9. Mercer, Computing Fundamental with C++ , Palgrave Macmillan

Computer Networks
CSE-502T

L	P
4	0

Unit I

Introduction: Uses of Computer Networks, Network and Protocol Architecture, Reference Model (ISO-OSI, TCP/IP-Overview

Physical Layer: Data and signals, Transmission impairments, Data rate limits, Performance factors, Transmission media, Wireless transmission,

UNIT-II

Data Link layer – Design Issues, Error detection and Correction, Elementary and sliding Window data link protocols, Data link layer in HDLC, Point to Point protocol ALOHA, carrier sense multiple access, collision free protocols, IEEE standards –802.3, 802.4, 802.5: Transparent and source routing bridges.

UNIT-III

Network Layer: IP Addressing, IPv.4 Vs IPv.6, Class C Subnetting, virtual circuit and datagram subnets – Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad-cast, multicast, distance vector routing. Congestion control Algorithms – General principles of congestion prevention policies.

Internet working: The Network layer in the Internet.

UNIT-IV

Transport Layer: Transport services, Elements of Transport protocols, Internet Transport Protocols. TCP,UDP,TCP sockets

UNIT-V

Application Layer-Network Security: Domain Name system: Electronic Mail; The world Wide Web; DHCP;

TEXT BOOKS:

1. W. Stallings, "Computer Communication Networks", PHI, 1999.
2. Computer Networks – Third Edition – Andrew S. Tanenbaum, Prentice Hall of India.
3. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.

References:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.
3. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1998.
4. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication, 1999.

Operating System
CSE-503T

L	P
4	0

UNIT I
Computer System Overview-Basic Elements, Instruction Execution, Operating system functions and structure, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System, Distributed OS.

UNIT II
Process concept, Process States, Process Description and Process Control, Interprocess Communication, Processes and Threads, Types of Threads, Multicore and Multithreading,

UNIT III
Principles of Concurrency - Mutual Exclusion, Semaphores, Monitors, Readers/Writers problem. Deadlocks – prevention- avoidance – detection, Scheduling- Types of Scheduling – Scheduling algorithms.

UNIT IV
Memory management requirements, Partitioning, Paging and Segmentation, Virtual memory - Hardware and control structures, operating system software, Linux memory management, Windows memory management. Virtual memory management.

UNIT V
I/O management and disk scheduling – I/O devices, organization of I/O functions; OS design issues, I/O buffering, disk scheduling, RAID, Disk cache. File management – Organization, Directories, File sharing, and Record blocking, secondary storage management.

Text Books:

1. Silberschatz, Peter Galvin, Greg gagne "Operating System Principles".
2. Gary J.Nutt, "Operating Systems", Pearson/Addison Wesley.

Reference Books:

1. Andrew S. Tannenbaum & Albert S. Woodhull, "Operating System Design and Implementation", Prentice Hall.
2. Andrew S. Tannenbaum, "Modern Operating Systems", Prentice Hall.
3. Pramod Chandra P.Bhatt, "An Introduction to Operating Systems Concepts and Practice".
4. Harvey M Dietel,Paul Dietel,David R Choffnes "Operating Systems" Prentice Hall

Mathematics-V (Numerical Methods)

CSE 504T

L	P
3	0

Unit-I:

1. **Finite Difference:** Difference Table and its usage. The difference operators Δ, ∇ and the operator E.
2. **Interpolation:** Interpolation with equal intervals, Newton's advancing difference formula. Newtons's backward difference formula. Interpolation with unequal intervals. Newton's divided difference formula. Lagrange's interpolation formula.
3. **Central Differences:** The central difference operator δ and the overraging operator μ. Relations between the operators.Gauss forward and backward interpolation formula, Sterlings, Bessel's, Laplace and Everetts formulae.

Unit-II

1. **Inverse interpolation**: Inverse interpolation by (i) Langrange's (ii) Methods of successive e approximation & (iii) Methods of elimination of third differences
2. **Numerical solution of algebraic and Transcendental Equations:** Graphic Method, Regula-Fast method, Balzano's Process of bisection of intervals, Newton-Raphson Method and its geometrical significance.

Unit-III:

1. **Numerical Integration:** Numerical Integration, General Quadrature Formula, Simpson's one-third and three-eight rules, Weddles' rule, Hardy's rule, Trapezoidal rule.
2. **Numerical differentiation :** Numerical differentiation of a friction. Differential coefficient of a friction in terms of its differences. Applications

Unit-IV

1. **Difference Equations:** Linear-homogeneous and non-homogenoeus difference equations of order n with constant coefficient, and their solution, methods of undetermined coefficient.

Unit-V

1. **Numerical Solution of ordinary differential equations:** Numerical solution of ordinary differential equations, Picard's method. Taylors series method, Euler's method, Runge-Kutta Method.

Books Recommended:

1. Introductory methods in Numerical Analysis by S.S.Sastry, Prentice Hall of India.
2. Numerical Methods for Scientists and Engineering by M.K.Jain, S.R.Iyengar & R.K. Jain, Wiley Eastern Ltd.
3. Mathematical Numerical Analysis by S.C. Scarborough, Oxford and IBH publishing Company.
4. Numerical Solution of Differential equations by M.K.Jain.
5. Numerical Methods for Science & Engineering by R.G.Stanton.

FORMAL LANGUAGES AND AUTOMATA THEORY
CSE505T

L P
4 0

Unit -I

Introduction to finite Automata: Introduction to finite automata, The central concepts of Automata theory, Deterministic finite automata, Nondeterministic finite Automata

Unit-II

Finite Automata & Regular Expressions: An application of finite Automata, Finite Automata with epsilon-transitions, Regular expressions, finite Automata and Regular expressions, pumping lemma for RE, Equivalence and minimization of automata

Unit-III

Context Free Grammars and Languages: Context free grammars , Parse trees , Ambiguity in Grammars, Left Recursion, Eliminating epsilon productions, Eliminating Unit productions , Chomsky normal form, Grieback normal form

Unit-IV

Pushdown Automata: Definition of the pushdown automata, the languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata

Unit-V

Introduction to Turing Machine: The Turing Machine, Programming techniques for Turing machines, Extensions to the basic Turing machines

REFERENCE BOOKS:

1. Jhon E. Hopcroft,,Rajeev Motwani, Jeffery D.Ullman: Introduction to Automata Theory, Languages and Computation, 3rd edition, pearson education, 2007
2. K.L.P. Mishra: Theory of Computer Science, Automata , Languages and Computation, 3rd edition, PHI, 2007
3. Jhon C martin: Introduction to languages and Automata Theory, 3rd edition ,Tata McGraw-hill,2007
4. A.M. Padma reddy : Formal Languages and Automata theory, 3rd edition, United Publishers,2009
5. Shirish S. Sane: Theory of computer science, 2nd edition, Technical publications Pune

Microprocessor Peripherals and Interfacing
CSE-506T

L	P
4	0

UNIT-I

Introduction To 8-bit Microprocessor: History of Microprocessor, 8085 Microprocessor architecture, buses, register, flags. 8085 pin configuration & function of each pin. Fetch, Decode and execute operations. Op-code Fetch, execute cycle, T state, Machine cycle. Memory and I/O read and write cycles WAIT state, interrupt timing diagram

UNIT-II

Intel 8085 Microprocessor Instruction Set and Programming: Addressing modes of 8085. Data transfer, Arithmetic, Logical, Rotate, Branch and machine control instructions. Development of 8085 assembly language programs, time delays. Concept of stack and Instruction related to stack. 8085 interrupts, RST, RIM, SIM instructions. Subroutines and conditional call instruction.

UNIT-III

Interfacing of Memory Chips & Input / Output Chips : Memory mapped I/o and I/O mapped I/O. Address decoding, interfacing of memory chips with 8085. Interfacing of input/output chips with 8085**UNIT-IV**

Peripherals IC and Applications : Block diagram, Pin description and Interfacing of 8255(PPI) with 8085 Microprocessor. Interfacing of keyboard, display, ADC and DAC to 8255. Block diagram, Pin description and Interfacing of 8253(PIT) with 8085 Microprocessor. Brief description and application of 8259 PIC, 8251 USART and 8237 DMA Controller

UNIT-V

Introduction advance Microprocessor : Intel 8086 Microprocessor architecture, Addressing Modes, 8086 pin configuration & function of each pin. Introduction and advance features of 8088, 80186, 80286, 80386 and 80486 microprocessor

REFERENCES :

1. Microprocessor Architecture, Programming, and Applications with the 8085 –Ramesh S. Gaonkar
2. Microprocessor 8085 and its Interfacing, By Sunil Mathur, Second Edition, PHI Learning Pvt. Ltd. Pub: Penram International.
3. 8085 Microprocessor And its Applications, By A. Nagoor Kani, Third Edition,TMH Education Pvt.Ltd
4. Microprocessors and interfacing - Douglas V. Hall, TMH, 2nd Edition, 1999.
5. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design - Y.Liu and G.A. Gibson, PHI, 2nd edition
6. Microprocessors 8086/ 8088 - Avatar singh and Triebel, PHI.
7. Assembly Language Techniques for the IBM PC - Alan R, Miller, BPB (for DOS and BIOS interrupts only)

Object Oriented Programming and System Design Lab
CSE-507P

L	P
0	2

1. Program illustrating function overloading feature.
2. Programs illustrating the overloading of various operators
   Ex: Binary operators, Unary operators, New and delete operators etc.
3. Programs illustrating the use of following functions:
   a) Friend functions. b) Inline functions c) Static Member functions
   d) Functions with default arguments.
4. Programs to create singly and doubly linked lists and perform insertion and deletion Operations.
   Using self referential classes, new and delete operators.
5. Programs illustrating the use of destructor and the various types of constructors (no arguments, constructor, constructor with arguments, copy constructor etc).
6. Programs illustrating the various forms of inheritance:
   Ex. Single, Multiple, multilevel, hierarchical inheritance etc.
7. Write a program having student as on abstract class and create many derived classes such as Engg, Science, Medical, etc. from student class. Create their objects and process them.
8. Write a program illustrating the use of virtual functions.
9. Write a program which illustrates the use of virtual base class.
10. Write program which illustrates the use of class templates.
    Ex. a) Stack class b) Queue class.
11. Write programs illustrating file handling operations:
    Ex. a) Copying a text file b) Displaying the contents of the file etc.
12. Write programs illustrating the console I/O operations.
13. Write programs illustrating how exceptions are handled (ex: division-by-zero, Overflow and underflow in stacks etc.).
14. Write. Programs to implement simple case studies with class model in C++.
15. Write programs to implement different relationships in class model like generalization, association, aggregation etc. in C++

16. Mini Project based on modeling using UML

Computer Networks Lab
CSE 508P

L-P
0- 2

1. Identification of guided media (UTP,Fibre) /Color coding.
2. To Connect two pc using peer to peer communication/via switch/via router.
3. IP addressing (static and dynamic).
4. Sharing the resources in wired network (software and hardware).
5. Configuring the Windows server (Active directory) and DHCP server.
6. Programs using TCP Sockets (like date and time server & client, echo server & client, etc..)
7. Programs using UDP Sockets (like simple DNS)
8. Programs using Raw sockets (like packet capturing and filtering)
9. Programs using RPC
10. Simulation of sliding window protocols
11. Performance comparison of MAC protocol
12. Performance comparison of Routing protocols
13. Study of TCP/UDP performance
14. Simulation of ARP / RARP.
15. Simulation of Sliding-Window protocol.
16. Simulation of BGP / OSPF routing protocol.
17. Study of NS2/ GLOMOSIM / OPNET.
18. To implement wired network topology and wireless network topology in NS2.
19. To Plot Efficiency of pure Aloha and slotted ALOHA in MATLAB.

Microprocessors Peripherals & Interfacing
CSE-509P

L P
0 2

1. To develop a program to add two double byte numbers.
2. To develop a subroutine to add two floating point quantities.
3. To develop program to multiply two single byte unsigned numbers, giving a 16 bit product.
4. To develop subroutine which will multiply two positive floating point numbers.
5. To write program to evaluate P* Q*+R* & S are 8 bit binary numbers.
6. To write a program to divide a 4 byte number by another 4 byte number.
7. To write a program to divide an 8 bit number by another 8 bit number upto a fractional quotient of 16 bit.
8. Write a program for adding first N natural numbers and store the results in memory location X.
9. Write a program which decrements a hex number stored in register C. The Program should half when the program register reads zero.

10. Write a program to introduce a time delay of 100 ms using this program as a subroutine display numbers from 01H to OAH with the above calculated time delay between every two numbers.
11. N hex numbers are stored at consecutive memory locations starting from X. Find the largest number and store it at location Y.
12. Interface a display circuit with the microprocessor either directly with the bus or by using I/O ports. Write a programme by which the data stored in a RAM table is displayed.
13. To design and interface a circuit to read data from an A/D converter, using the 8255 A in the memory mapped I/O.
14. To design and interface a circuit to convert digital data into analog signal using the 8255 A in the memory mapped I/O.
15. To interface a keyboard with the microprocessor using 8279 chip and transfer the output to the printer.
16. To design a circuit to interface a memory chip with microprocessor with given memory map.

SYLLABUS FOR 7TH SEMISTER

FORMAL LANGUAGES AND AUTOMATA THEORY
CSE701T

L-T-P
3-1-0

Unit -I

Introduction to finite Automata: Introduction to finite automata, The central concepts of Automata theory, Deterministic finite automata, Nondeterministic finite Automata

Unit-II

Finite Automata & Regular Expressions: An application of finite Automata, Finite Automata with epsilon-transitions, Regular expressions, finite Automata and Regular expressions, pumping lemma for RE, Equivalence and minimization of automata

Unit-III

Context Free Grammars and Languages: Context free grammars , Parse trees , Ambiguity in Grammars, Left Recursion, Eliminating epsilon productions, Eliminating Unit productions , Chomsky normal form, Grieback normal form

Unit-IV

Pushdown Automata: Definition of the pushdown automata, the languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata

Unit-V

Introduction to Turing Machine: The Turing Machine, Programming techniques for Turing machines, Extensions to the basic Turing machines

REFERENCE BOOKS:

6. Jhon E. Hopcroft,,Rajeev Motwani, Jeffery D.Ullman: Introduction to Automata Theory, Languages and Computation, 3rd edition, pearson education, 2007

7. K.L.P. Mishra: Theory of Computer Science, Automata , Languages and Computation, 3rd edition, PHI, 2007
8. Jhon C martin: Introduction to languages and Automata Theory, 3rd edition ,Tata McGraw-hill,2007
9. A.M. Padma reddy : Formal Languages and Automata theory, 3rd edition, United Publishers,2009
10. Shirish S. Sane: Theory of computer science, 2nd edition, Technical publications Pune

Artificial Neural Networks And Fuzzy Logic
CSE702T

L-T-P
3-1-0

Unit – I: Introduction to Neural Networks
Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential applications of ANN.

Unit – II: Essentials of Artificial Neural Networks
Artificial Neuron Models, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules.

Unit–III: Single and multilayer Feed Forward Neural Networks
Introduction, Perception Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perception Networks, Limitations of the Perception Model. Generalized Delta Rule, Derivation of Back propagation (BP) Training, Summary of Back propagation Algorithm, Learning Difficulties and Improvements.

Unit IV: Associative Memories
Paradigms of Associative Memory, Hebbian Learning, General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, Architecture of Hopfield Network, Storage and Recall Algorithm, Stability Analysis.

Unit – V: Classical & Fuzzy Sets
Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.
Fuzzification, Membership value assignment, development of rule base and decision making system
Neural network applications in Process identification and fault diagnosis.

TEXT BOOK:

1. S. Rajasekharan and G. A. Vijayalakshmi pai, "Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications", PHI Publication, 2004.
2. John Yen and Reza Langan, "Fuzzy Logic: Intelligence, Control and Information", Pearson Education, 2004.
3. Mohamad H. Hassoun, "Fundemanatals of Artificial Neural Networks", MIT Press.
4. Jian-Kang Wu, "Neural Networks and Simulation methods", CRC Press.

Web Technology
CSE703T

L-T-P
3 -1- 0

Unit I

History of the Internet and World Wide Web – HTML protocols – HTTP, SMTP, POP3, MIME, IMAP. HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets

JavaScript: Introduction, Documents, Documents, forms, Statements, functions, objects in JavaScript, Events and Event Handling, Arrays, FORMS, Buttons, Checkboxes, Text fields and Text areas.

Unit II

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX, Overview of, XPath, XQuery, and XSLT. . Ajax– Improving web page performance using Ajax, Programming in Ajax.

Unit III

Introduction to J2EE architecture : Single Tier Two Tier Three Tier N Tier .

J2EE Contianers : Container Types, Container Services

JAVA servlets: Introduction to Web Programming , Advantages of Servlets, Servlet Lifecycle, Request Dispatching, Session Tracking

UNIT IV

JAVA SERVER PAGES (JSP) & JSTL: JSP Architecture, JSP Objects , Custom Tags, JSP Elements, Using tags of JSTL ,expression languages

UNIT V

Overview of MVC, Implementing Model-View-Controller, The Struts Model, Deploying Action Servlet, ActionForm, ActionMapping and Action Errors, Relational Data.

BOOKS RECOMMENDED

1. Deitel and Deitel, Goldberg, "Internet and World Wide Web – How to Program", Pearson Education Asia, 2001.
2. Professional Jakarta Struts James Goodwill, Richard Hightower wrox publication
3. Mathew Eernisse, "Build Your Own AJAX Web Applications", SitePoint, 2006.
4. JavaScript: The Definitive Guide, Fourth Edition By David Flanagan O'Reilly Media
5. Professional Java Server Programming J2EE edition Volume I,II Wrox publications
6. 'Beginning XML' by David Hunter and David Gibbons wrox publication
7. "Using HTML 4, XML and JAVA", Eric Ladd, Jim O' Donnel, Prentice Hall of India
8. Web Programming, building internet applications, Chris Bates, WILEY Dreamtech
9. Programming world wide web-Sebesta, Pearson
10. Java for web with Servlets, JSP and EJB by Budi Kurniwan Techmedia publications
11. J2EE professional projects by Pallvai Jain and Shahdab siddiqi PHI
12. Head First JSP and servlets Kathy Sierra Bert Bates and Bryan Bashgm oreilly publications
13. Ivan Bayross , sharanam shah Java Server Programming , shroff Publishers
14. Hans Bergsten, "Java Server Pages", SPD O'Reilly

DATA WAREHOUSING AND DATA MINING
CSE704T

L-T-P
3-1-0

UNIT I

Overview of decision support systems: Organizational need for strategic information, Failures of past decision-support systems, operational versus decision-support systems, data warehousing – the only viable solution, data warehouse defined. Data warehouse – The building Blocks: Defining Features, data warehouses and data marts, overview of the components, metadata in the data warehouse

Defining the business requirements: Dimensional analysis, information packages – a new concept, requirements gathering methods, requirements definition: scope and content

UNIT II

Principles of dimensional modeling: Objectives, From Requirements to data design, the STAR schema, STAR Schema Keys, Advantages of the STAR Schema,Dimensional Modeling: Updates to the Dimension tables, miscellaneous dimensions, the snowflake schema, aggregate fact tables, families of STARS

UNIT III

OLAP in the Data Warehouse: Demand for Online analytical processing, need for multidimensional analysis, fast access and powerful calculations, limitations of other analysis methods, OLAP is the answer, OLAP definitions and rules, OLAP characteristics, major features and functions, general features, dimensional analysis, what are hypercubes? Drill-down and roll-up, slice-and-dice or rotation, OLAP models, overview of variations, the MOLAP model, the ROLAP model, ROLAP versus MOLAP, OLAP implementation considerations

UNIT IV

Data Mining Basics: What is Data Mining, Data Mining Defined, The knowledge discovery process, OLAP versus data mining, data mining and the data warehouse, Major Data Mining Techniques, Cluster detection, decision trees, memory-based reasoning, link analysis, neural networks

UNIT V

Genetic algorithms, moving into data mining, Data Mining Applications, Benefits of data mining, applications in retail industry, applications in telecommunications industry, applications in banking and finance.

REFERENCE BOOKS:

1. **Paul Raj Poonia,** "Fundamentals of Data Warehousing", **John Wiley & Sons**
2. **Sam Anahony,** "Data Warehousing in the real world: A practical guide for building decision support systems", **John Wiley**
3. **Alex Berson, Stephen J. Smith,** "Data Warehousing, Data Mining & OLAP", **Tata McGraw Hill**
4. **W. H. Inmon,** "Building the operational data store", **John Wiley**
5. **Kamber and Han,** "Data Mining Concepts and Techniques", **Hartcourt India P. Ltd.**

MOBILE COMPUTING
CSE705T

L-T-P
3-1-0

Unit – I

Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

Unit - II

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

Unit – III

Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

Unit - IV

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

Unit – V

Ad Hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

Books:

1. J. Schiller, Mobile Communications, Addison Wesley.
2. A. Mehrotra , GSM System Engineering.
3. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
4. Charles Perkins, Mobile IP, Addison Wesley.
5. Charles Perkins, Ad hoc Networks, Addison Wesley

Multimedia Technology
CSE706T

L-T-P
3-1-0

Unit-I: Introduction
Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. Convergence of Computer, Communication and Entertainment products
Stages of Multimedia Projects
Multimedia hardware, Memory & storage devices, Communication devices, Multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, card and page based authoring tools.
Unit-II: Multimedia Building Blocks
Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture.
Unit-III: Data Compression
Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding Higher Order Modelling. Finite Context Modelling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression.
Unit-IV: Speech Compression & Synthesis
Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression & silence compression.
Unit-V: Images
Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formatic animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database.Content based retrieval for text and images,**Video:**Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in Multimedia.
Books:
1. Tay Vaughan “Multimedia, Making IT Work” Osborne McGraw Hill.
2. Buford “Multimedia Systems” Addison Wesley.
3. Agrawal & Tiwari “Multimedia Systems” Excel.
4. Mark Nelson “Data Compression Book” BPB.
5. David Hillman “Multimedia technology and Applications” Galgotia Publications.
6. Rosch “Multimedia Bible” Sams Publishing.
7. Sleinreitz “Multimedia System” Addison Wesley.
8. James E Skuman “Multimedia in Action” Vikas.

MODELING AND SIMULATION
CSE707T

L-T-P
3-1-0

UNIT I
Concepts of Systems, Models, and Simulation. Distributed Lag Model, Cobweb Models, The process of a simulation Study, Exponential Growth Models, Exponential Decay Models,

UNIT II
Type of simulation, Discrete-Event Simulation: Time-Advance Mechanisms, Components and Organization of a Discrete-Event Simulation Model. Monte Carlo Method. Simulation of Single-Server Queuing System, Simulation of an Inventory System

UNIT III

Continuous Simulation: Pure-pursuit Problem.

Random Number Generators: Linear Congruential Generators, Other kinds of Generators, Testing Random-Number Generators.
Generating Random Variates: General Approaches, Continuous and Discrete distributions.

UNIT IV
Introduction to GPSS, General Description, GPSS block-diagram, Simulation of a Manufacturing Shop. SNA, Function, Simulation of a Supermarket, GPSS Model of a Simple Telephone System

UNIT V
Output Data Analysis for a Single System: Transient and Steady-State Behavior of a Stochastic Process, Type of Simulations with regard to output Analysis and Statistical Analysis for Testing Simulation. Verification and Validation of Simulation. An introduction of different types of simulation languages.

REFERENCE BOOKS:

1. **G. Gordon,** "System Simulation", **Pearson Education**
2. **Law and Kelton,** "Simulation Modeling and Analysis", **McGraw Hill**
3. **N. Deo,** "System Simulation with Digital Computer", **Prentice Hall of India**
4. **Fred Maryanski,** "Digital Computer Simulation", **CBSPD**
5. **James A. Pyne,** "Introduction to Simulation- Programming Techniques and Methods of Analysis", **McGraw Hill**
6. **Zeigler and Kim,** "Theory of Modeling and Simulation", **Academic Press**
7. **Banks et al,** "Discrete event Simulation", **Pearson Education**

Digital Signal Processing
CSE708T

L-T-P
3-1-0

UNIT I

SIGNALS AND SYSTEMS

Basic elements of digital signal Processing –Concept of frequency in continuous time and discrete time signals –Sampling theorem –Discrete time signals. Discrete time systems –Analysis of Linear time invariant systems –Z transform –Convolution

UNIT II

FAST FOURIER TRANSFORMS

Introduction to DFT – Efficient computation of DFT Properties of DFT – FFT algorithms – Radix-2 and Radix-4 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms – Use of FFT algorithms in Linear Filtering and correlation.

UNIT III

IIR FILTER DESIGN

Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR filter design by Impulse Invariance. Bilinear transformation – Approximation derivatives – Design of IIR filter in the Frequency domain.

UNIT IV

FIR FILTER DESIGN

Symmetric & Antisymteric FIR filters – Linear phase filter – Windowing technique – Rectangular, Kaiser windows – Frequency sampling techniques – Structure for FIR systems.

UNIT V

FINITE WORD LENGTH EFFECTS

Quantization noise – derivation for quantization noise power – Fixed point and binary floating point number representation – comparison – over flow error – truncation error – co-efficient quantization error - limit cycle oscillation – signal scaling – analytical model of sample and hold operations – Application of DSP – Model of Speech Wave Form – Vocoder.

TEXT BOOK

1. John G Proakis and Dimtris G Manolakis, “Digital Signal Processing Principles, Algorithms and Application”, PHI/Pearson Education, 2000, 3rd Edition.

REFERENCES

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, “Discrete Time Signal Processing”, PHI/Pearson Education, 2000, 2nd Edition.
2. Johny R.Johnson, “Introduction to Digital Signal Processing”, Prentice Hall of India/Pearson Education, 2002.
3. Sanjit K.Mitra, “Digital Signal Processing: A Computer – Based Approach”, Tata McGraw-Hill, 2001, Second Edition.

Artificial Neural Networks and Fuzzy Logic Lab

CSE709P

NOTE: Tool to be Used is METLAB Only

1. Train a perceptron to learn the **inclusive or** function:
    a. Train the perceptron at least five times (i.e., with five different initial weight configurations). On average, how many iterations are necessary for the network to reach the stopping criterion?
    b. Describe the general shape of the learning curve over the different training sessions.
    c. Lower the stopping criteria to successively stricter criteria (e.g., .01, .001, .0001). Describe the general shape of the learning curve for each case.
2. Train a perceptron to learn the **exclusive or** function:
    a. Train the perceptron to learn this function multiple times. Does it ever reach the stopping criterion?
3. Train a multi-layer perceptron to learn the **exclusive or** function.
    a. Train a multi-layer perceptron to learn the **exclusive or** function about ten times. On average, how many iterations are necessary for the network to reach the stopping criterion?
    b. What is the general shape of the learning curve over the different training sessions?
    c. Adjust the number of hidden units in the multi-layer perceptron (e.g. 1 unit, 3 units, 5 units), and retrain multiple times. Describe the behavior of the network (i.e. the average number of iterations to reach the criterion, and the general shape of the learning curve) across the different conditions.
4. Train a Network to Verify the Out Put of Following Gates:

    i) NAND
    ii) OR
    iii) EX-OR

5. Train a Network to Verify the Out Put of Following Combinational Logic Circuits:

WEB TECHNOLOGY LAB

CSE710P

1):- Create A Simple HTML Document.

a) Text inside paragraphs is displayed
b) The use of line breaks
c) Heading tags
d) Center aligned heading
e) Insert a horizontal rule
f) Add a background color

2)

With HTML how will you display images in a document?

3) How to insert a different types of images in HTML Document**.**

a) Background image
b) Aligning images
c) Let the image float
d) Adjust images to different sizes
e) Display an alternate text for an image
f) Make a Hyperlink

4) Create a form which will have 2 textboxes,1 textarea,2 radio buttons, 5 Checkboxes ,1 Dropdown list, send and reset buttons.

5) Write a script for performing the validation for email field "femailid" of the form?

6) Write the code for validating a form text-field for only accepting zip-code and phone number in the following format?

Zipcode: 100016

Phone no: 91-011-7268394

7) Create XML file that contains details of the books, name of the book, The ISBN of the book, the first and last name of the author of the book and price of the book

8) Create an XML Schema to validate the data store about product. The product Details must be stored in a consistence format. Restriction must be placed on the Kind of data that can be

saved in the data store to ensure consistency. The product details comprise the name of the product, a brief description about it, the price of the product, and the quantity available .The price must always be greater than Zero

9) Create attribute in an xml schema. A shop sells two categories of products, books and toys The product details comprise the name of the product, a brief description, the price and the quantity available. The price of the product always be greater than zero. In additions to these details, you also need to store the category and productId.

10) Create an XSLT style sheet for formatting data.The book details that have to be displayed are book ID,title,and rate of books. The book details must be displayed in the ascending order of rate and bookID

11) Simple exercises to learn the concept of Servlets,JSP

12) Servlet-based implementation of Airline Reservation system

13) Implementation of Mail Server

14) Implementation of Quiz Server

15) Implementation of ATM

16) Implementation of Online Shopping System

17) Implementation of matrimonial System

18) Implementation of MVC design pattern using struts framework