

**B.TECH. WEEKEND SEMESTER- I**  
**MATH(W)-101 : MATHEMATICS-III**  
**(COMMON TO ALL BANCHES)**

L T P Credits  
3 - - 5

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Part-A**

**Fourier Series and Fourier Transforms** : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series.

Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

**Part-B**

**Functions of Complex Variable** : Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeros and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

**Part-C**

**Probability Distributions and Hypothesis Testing**: Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.

**Linear Programming**: Linear programming problems formulation, solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

**TEXT BOOKS:**

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

**REFERENCE BOOKS:**

1. Advance Engg. Mathematics : R.K. Jain, S.R.K. Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson. PHI.

**NOTE:** Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five questions taking at least one from each part.

**B.TECH. WEEKEND SEMESTER- I**  
**HUM(W)- 101 : ECONOMICS**  
**(COMMON TO ALL BANCHES)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**COURSE OBJECTIVE :** The purpose of this course is to :

1. Acquaint the student in the basic economic concepts and their operational significance and
2. Stimulate him to think systematically and objectively about contemporary economic problems.

**UNIT-I :** Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

**UNIT-II:** Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

**UNIT-III:** Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

**UNIT-IV:** Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale.

Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

**UNIT-V:** Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligopoly, Monopolistic Competition (Main features of these markets)

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices.

**UNIT-VI:** Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits. Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

**TEXT BOOKS:**

1. Principles of Economics : P.N. Chopra (Kalyani Publishers).
2. Modern Economic Theory – K.K. Dewett (S.Chand)

**REFERENCE BOOKS :**

1. A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2. Micro Economic Theory – M.L. Jhingan (S.Chand)
3. Micro Economic Theory - H.L. Ahuja (S.Chand)
4. Modern Micro Economics : S.K. Mishra (Pragati Publications)
5. Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6. Indian Economy : Rudar Dutt & K.P.M. Sundhram

**NOTE:** Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- I**  
**CSE(W)- 101 : INTERNET FUNDAMENTALS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Electronic Mail:** Introduction, advantages and disadvantages, Userids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, Mime types, Newsgroups, mailing lists, chat rooms.

**Unit-2: The Internet:** Introduction to networks and internet, history, Working of Internet, Internet Congestion, internet culture, business culture on internet. Collaborative computing & the internet. Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, domain name, DNS, IP.v6.Modems and time continuum, communications software; internet tools.

**Unit-3: World Wide Web:** Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP.  
Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formatting and hyperlink creation.  
Using FrontPage Express, Plug-ins.

**Unit-4: Languages:** Basic and advanced HTML, java script language, Client and Server Side Programming in java script. Forms and data in java script, XML basics.

**Unit-5 : Servers:** Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

**Unit-6: Privacy and security topics:** Introduction, Software Complexity, Encryption schemes, Secure Web document, Digital Signatures, Firewalls.

**TEXT BOOKS:**

1. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
2. Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

**REFERENCE BOOKS:**

1. Complete idiots guide to java script,. Aron Weiss, QUE, 1997
2. Network firewalls, Kironjeet syan-New Rider Pub.
3. [www.secinf.com](http://www.secinf.com)
4. [www.hackers.com](http://www.hackers.com)
5. Alfred Gikossbrenner-Internet 101 Computing MGH, 1996

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- I**  
**CSE(W)- 103 : DISCRETE STRUCTURES**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Set Theory:** Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations and lattices.

Function and its types, Composition of function and relations, Cardinality and inverse relations

**Unit-2: Propositional Calculus:** Basic operations: AND( $\wedge$ ), OR( $\vee$ ), NOT( $\sim$ ), Truth value of a compound statement, propositions, tautologies, contradictions.

**Unit-3: Techniques Of Counting:** Permutations with and without repetition, Combination.

**Unit-4: Recursion And Recurrence Relation:** Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

**Unit-5: Algebraic Structures:** Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

**Unit-6: Graphs And Trees:** Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eulerian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

**TEXT BOOK:**

1. Elements of Discrete Mathematics by C.L Liu, 1985, McGraw Hill

**REFERENCE BOOKS:**

1. Discrete Mathematics by Johnson Bough R., 5<sup>th</sup> Edition, PEA, 2001.
2. Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
3. Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
4. Applied Discrete Structures for Computer Science, Doerr and Lévassieur, (Chicago: 1985, SRA
5. Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
6. Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
7. Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
8. Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- I**  
**ECE(W)- 105 : DIGITAL & ANALOG COMMUNICATION**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Communication system components:** Introduction to Communication: Definition & means of communications; Digital and analog signals: sign waves, square waves; Properties of signals: amplitude, frequency, phase; Theoretical basis for data communication: Fourier analysis: Fourier series and Fourier Transform (property, ESD, PSD and Raleigh) effect of limited bandwidth on digital signal.

**Unit-2: Data Transmission System:** Physical connections: modulation, amplitude-, frequency-, phase-modulation; Data encoding: binary encoding (NRZ), Manchester encoding, differential Manchester encoding.

Transmission Media: Twisted pair-, co-axial-, fiber optic-cables, wireless media Transmission impairments: attenuation, limited bandwidth of the channels, delay distortion, noise, data rate of the channels (Nyquist theorem, Shannon limit). Physical layer interfaces: RS 232, X.21

**Unit-3: Standards in data communications:** Communication modes: simplex, half duplex, full duplex; Transmission modes: serial-, parallel-transmission; Synchronizations: Asynchronous-, synchronous-transmission; Type of services: connection oriented-, connectionless-services; Flow control: unrestricted simplex protocol, simplex stop- and -wait protocol, sliding window protocol; Switching systems: circuit switching; picketing switching: data gram , virtual circuits, permanent virtual circuits. Telephone Systems: PSTN, ISDN, asynchronous digital subscriber line. Multiplexing: frequency division-, time-, wave- division multiplexing

**Unit-4: Security in data communications:** Transmission errors: feedback-, forward-error control approaches; Error detection; Parity check, block sum check, frame check sequences; Error correction: hamming codes, cyclic redundancy check; Data encryption: secret key cryptography, public key cryptograph; Data compression: run length encoding, Huffman encoding.

**TEXT BOOK:**

1. Data Communications, Computer Networks and Open Systems Halsall Fred, (4<sup>th</sup> editon) 2000, Addison Wesley, Low Price edition

**REFERNECE BOOKS:**

1. Business Data Communications, Fitzgerald Jerry, 7<sup>th</sup> Ed. New York, 2001, JW&S,
2. Communication Systems, 4<sup>th</sup> Edi, by A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, 2002, TMH.
3. Data Communications, Computer Networks and Open Systems, Halsall Fred, 1996, AW.
4. Digital Communications, J.G. Proakiss, 4<sup>th</sup> Ed., MGH
5. Satellite Communication, Pratt, John Wiley
6. Data & Computer Communications, W.Stallings PHI
7. Digital & Data Communication systems, Roden 1992, PHI,
8. Introduction to Digital & Data Communications, Miller Jaico Pub.
9. Data Communications and Networking, Behrouz A. Forouzan, 2003, 2<sup>nd</sup> Edition, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- I**  
**CSE(W)- 121 : INTERNET LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

Do the Exercises involving:

1. Sending and receiving mails.
2. Chatting on the net.
3. Using FTP and Tel net server.
4. Using HTML Tags (table, form, image, anchor etc.).
5. Making a Web page of your college using HTML tags.

**NOTE:** Total ten programs are to be performed in the Semester. The specific programming problems should be performed as designed & set by the concerned faculty as per the scope of the syllabus.

**B.TECH. WEEKEND SEMESTER- I**  
**CSE(W)- 125 : PERSONAL COMPUTER LAB**

L T P Credits  
- - 2 3

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

**PC Software:**

Application of basics of MS Word 2000, MS Excel 2000, MS Power Point 2000, MS Access 2000.

1. To prepare the Your Bio Data using MS Word
2. To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min and max marks in each subject.
3. Prepare a presentation explaining the facilities/infrastructure available in your college/institute.
4. Create a database of books in the library on a mini scale w.r.t. Computers and manipulate the database using different forms and reports.

**PC Hardware :**

1. To check and measure various supply voltages of PC.
2. To make comparative study of motherboards.
3. To observe and study various cables, connections and parts used in computer communication.
4. To study various cards used in a system viz. display card, LAN card etc.
5. To remove, study and replace floppy disk drive.
6. To remove, study and replace hard disk.
7. To remove, study and replace CD ROM drive.
8. To study monitor, its circuitry and various presents and some elementary fault detection.
9. To study printer assembly and elementary fault detection of DMP and laser printers.
10. To observe various cables and connectors used in networking.
11. To study parts of keyboard and mouse.
12. To assemble a PC.
13. Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.

**REFERENCE BOOKS:**

1. Complete PC upgrade & maintenance guide, Mark Mines, BPB publ.
2. PC Hardware: The complete reference, Craig Zacker & John Rouske, TMH
3. Upgrading and Repairing PCs, Scott Mueller, 1999, PHI,

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 102 : DATABASE MANAGEMENT SYSTEMS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction** Overview of database Management System; Various views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of Database Administrator,

**Unit-2:** Introduction to Client/Server architecture, Three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables.

**Unit-3: File Organisation:** Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.

**Unit-4:** Relational Model, Relational Algebra & various operations, Relational and Tuple calculus.

**Unit-5: Introduction to Query Languages:** QLB, QBE, Structured query language – with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION – (up to 4<sup>th</sup> Normal forms), BCNF (Boyce – code normal forms)

**Unit-6:** Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to Concurrency control and Recovery systems.

**TEXT BOOKS:**

1. Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3<sup>rd</sup> edition, 1997, McGraw-Hill, International Edition.
2. Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

**REFERENCE BOOKS:**

1. Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3<sup>rd</sup> edition, 2000, Addison-Wesley, Low Priced Edition.
2. An Introduction to Database Systems by C.J. Date, 7<sup>th</sup> edition, Addison-Wesley, Low Priced Edition, 2000.
3. Database Management and Design by G.W. Hansen and J.V. Hansen, 2<sup>nd</sup> edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
4. Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5<sup>th</sup> edition, 1999, Tata McGraw-Hill Publishing.
5. A Guide to the SQL Standard, Date, C. and Darwen, H. 3rd edition, Reading, MA: 1994, Addison-Wesley.
6. Data Management & file Structure by Looms, 1989, PHI

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 104 : PROGRAMMING LANGUAGES**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction:** Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters , Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations ,type checking & type conversions , Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

**Unit-2: Structured data objects:** Structured data objects & data types , specification & implementation of structured data types, Declaration & type checking of data structure ,vector & arrays, records Character strings, variable size data structures , Union, pointer & programmer defined data objects, sets, files.

**Unit-3: Subprograms and Programmer Defined Data Types:** Evolution of data type concept ,abstraction, encapsulation & information hiding , Subprograms ,type definitions, abstract data types.

**Unit-4: Sequence Control:** Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines, sequence control .

**Unit-5: Data Control:** Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope. Parameter & parameter transmission schemes.

**Unit-6: Storage Management:** Major run time elements requiring storage ,programmer and system controlled storage management & phases , Static storage management , Stack based storage management, Heap storage management ,variable & fixed size elements.

**Unit-7: Programming Languages:** Introduction to procedural, non-procedural ,structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

**TEXT BOOKS:**

1. Programming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
2. Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH.

**REFERENCE BOOKS:**

1. Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
2. Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.
3. Programming Languages – Principles and Pradigms, Allen Tucker, Robert Noonan 2002, T.M.H.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 106 : THEORY OF AUTOMATA & COMPUTATION**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Finite Automata and Regular Expressions:** Finite State Systems, Basic Definitions Non-Deterministic finite automata (NFA), Deterministic finite automata (DFA), Equivalence of DFA and NFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

**Unit-2: Introduction to Machines:** Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, Conversion of NFA to DFA by Arden's Method.

**Unit-3: Properties of Regular Sets:** The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

**Unit-4: Grammars:** Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

**Unit-5: Pushdown Automata:** Introduction to Pushdown Machines, Application of Pushdown Machines

**Unit-6: Turing Machines:** Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem.

**Unit-7: Chomsky Hierarchies:** Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

**Unit-8: Computability:** Basic concepts, Primitive Recursive Functions.

**TEXT BOOK:**

1. Introduction to automata theory, language & computations- Hopcroft & O.D.Ullman, R Mothwani, 2001, AW

**REFERENCE BOOKS:**

1. Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishra &
2. N.Chandrasekaran, 2000, PHI.
3. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
4. Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..
5. Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
6. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 108 : DATA STRUCTURES & ALGORITHMS**  
**(COMMON TO CSE, ECE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction to Data Structures:** Definition of data structures and abstract data types, Static and Dynamic implementations, Examples and real life applications; The Stacks : Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples : Infix, postfix, prefix representation, Conversions, Applications.

**Unit-2: Queues and Lists:** Definition, Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority Queues, Applications.

**Unit-3: Trees:** Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal pre-order, post order, In- order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, Implementations

**Unit-4: Graphs:** Definition of Undirected and Directed Graphs and Networks, The Array based implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Tables : Definition, Hash function, Implementations and Applications.

**Unit-5: Running time:** Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

**Unit-6: Sorting Algorithms :** Introduction, Sorting by exchange, selection, insertions : Bubble sort, Straight selection sort, Efficiency of above algorithms,; Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays& Algorithms; Quick sort Algorithm analysis,

**Heap sort:** Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach;

**Searching Algorithms:** Straight Sequential Search, Binary Search (recursive & non-recursive Algorithms)

**TEXT BOOK:**

1. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

**REFERENCE BOOKS:**

1. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition Addison-Wesley, 1999, Low Priced Edition.
2. Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
3. Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
4. Data Structures and Program Design in C By Robert Kruse, PHI,
5. Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH
6. Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
7. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 122 : DATABASE MANAGEMENT SYSTEMS LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

I. Create a database and write the programs to carry out the following operation :

1. Add a record in the database
2. Delete a record in the database
3. Modify the record in the database
4. Generate queries
5. Generate the report
6. List all the records of database in ascending order.

II Develop two menu driven project for management of database system:

1. Library information system
  - (a) Engineering
  - (b) MCA
2. Inventory control system
  - (c) Computer Lab
  - (d) College Store
3. Student information system
  - (e) Academic
  - (f) Finance
4. Time table development system
  - (g) CSE, IT & MCA Departments
  - (h) Electrical & Mechanical Departments

Usage of S/w:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. ORACLE, D2K
4. VB, MS SQL SERVER 2000

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- II**  
**CSE(W)- 128 : DATA STRUCTURES & ALGORITHM LAB**

L T P Credits  
- - 2 3

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only  
a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort Technique
5. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
7. Write a program to implement binary search tree.  
( Insertion and Deletion in Binary search Tree)
8. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
9. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
10. Create a linked list and perform the following operations on it  
a) add a node b) Delete a node
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate the various graph traversing algorithms.
13. Write a program which simulates the various tree traversal algorithms.

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- III**  
**CSE(W)- 201 : OBJECT- ORIENTED PROGRAMMING USING C++**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1:** Introduction to C++, C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Header Files and Namespaces, library files.

**Unit-2: Object Oriented Concepts :** Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable (public, protected, private, package), Other Modifiers, Polymorphism: Overloading,, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

**Unit-3: Classes and Data Abstraction:** Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Separating Interface from Implementation, Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes : Const(Constant) Object And Const Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

**Unit-4: Operator Overloading:** Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators.

**Unit-5: Inheritance:** Introduction, Inheritance: Base Classes And Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base –Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base- Class Object Conversion, Composition Vs. Inheritance.

**Unit-6: Virtual Functions and Polymorphism:** Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

**Unit-7: Files and I/O Streams:** Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Stream Input/Output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.

**Unit-8: Templates & Exception Handling:** Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members.

Introduction, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Rethrowing an Exception, Exception specifications, Processing Unexpected Exceptions, Stack Unwinding, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

**TEXT BOOKS:**

1. C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
2. Object Oriented Programming in Turbo C++ by Robert Lafore ,1994
3. Programming with C++ By D Ravichandran, 2003, T.M.H

**REFERENCE BOOKS:**

1. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
2. Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,

3. The Complete Reference in C++ By Herbert Schildt, 2002, TMH.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- III**  
**ECE(W)- 201 : DIGITAL ELECTRONICS**  
**(COMMON TO ECE, CSE, EE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT- 1: Fundamentals of digital techniques :** Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

**UNIT- 2: Combinational design using gates:** Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

**UNIT- 3: Combinational design using MSI devices:** Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors, BCD arithmetic circuits, Encoders, Decoders / Drivers for display devices.

**UNIT -4 : Sequential Circuits:** Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

**UNIT- 5: Digital logic families:** Switching mode operation of p-n junction, bipolar and MOS. devices. Bipolar logic families:RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, Interfacing of CMOS and TTL families.

**UNIT -6 : A/D and D/A converters:** Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for D/A converters. A/D converters : Quantization, parallel -comparator, successive approximation, counting type, dual-slope ADC, specifications of ADCs.

**UNIT- 7: Programmable logic devices:** ROM, PLA, PAL, FPGA and CPLDs.

**TEXT BOOK :**

1. Modern Digital Electronics(Edition III) : R. P. Jain; TMH

**REFERENCE BOOKS :**

1. Digital Integrated Electronics : Taub & Schilling; MGH
2. Digital Principles and Applications : Malvino & Leach; McGraw Hill.
3. Digital Design : Morris Mano; PHI.

**NOTE :** Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- III**  
**CSE(W)- 203 : COMPUTER ARCHITECTURE AND ORGANIZATION**  
**(COMMON TO CSE, ECE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Basic Principles:** Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters)

**Unit-2: General System Architecture:** Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

**Unit-3: Instruction Set Architecture:** Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MSAM.

**Unit-4: Basic non pipelined CPU Architecture:** CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.

**Unit-5: Memory Hierarchy & I/O Techniques:** The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations).

**Unit-6: Introduction to Parallelism:** Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).

**Unit-7: Computer Organization [80x86]:** Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy.

**TEXT BOOKS:**

1. Computer Organization and Design, 2<sup>nd</sup> Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
2. Computer Architecture and Organization, 3<sup>rd</sup> Ed, by John P. Hayes, 1998, TMH.

**REFERENCE BOOKS:**

1. Operating Systems Internals and Design Principles by William Stallings, 4<sup>th</sup> edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
2. Computer Organization, 5<sup>th</sup> Ed, by Carl Hamacher, Zvonko Vranesic, 2002, Safwat Zaky.
3. Structured Computer Organisation by A.S. Tanenbaum, 4<sup>th</sup> edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
4. Computer Organisation & Architecture: Designing for performance by W. Stallings, 4<sup>th</sup> edition, 1996, Prentice-Hall International edition.
5. Computer System Architecture by M. Mano, 2001, Prentice-Hall.

6. Computer Architecture- Nicholas Carter, 2002, T.M.H.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit.  
Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- III**  
**CSE(W)- 205: ANALYSIS & DESIGN OF ALGORITHMS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1:** Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

**Unit-2: Divide and Conquer:** General method, binary search, merge sort, quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

**Unit-3: Greedy Method:** General method, knapsack problem, job sequencing with dead lines, minimum spanning trees, single source paths and analysis of these problems.

**Unit-4: Dynamic Programming:** General method, optimal binary search trees, 0/1 knapsack, the traveling salesperson problem.

**Unit-5: Back Tracking:** General method, 8 queen's problem, graph colouring, Hamiltonian cycles, analysis of these problems.

**Unit-6: Branch and Bound:** Method, 0/1 knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

**Unit-7: NP Hard and NP Complete Problems:** Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

**TEXT BOOKS:**

1. Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni, 1978, Galgotia Publ.,
2. Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

**REFERENCE BOOKS:**

1. The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley.
2. Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons,
3. Writing Efficient Programs, Bentley, J.L., PHI
4. Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetniemi, 1997, MGH.
5. Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.
6. Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, D.E.: 1985, Naresh Publ.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- III**  
**CSE(W)- 221 : C++ PROGRAMING LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

- Q1. Raising a number  $n$  to a power  $p$  is the same as multiplying  $n$  by itself  $p$  times. Write a function called `power ( )` that takes a double value for  $n$  and an int value for  $p$ , and returns the result as double value. Use a default argument of 2 for  $p$ , so that if this argument is omitted, the number will be squared. Write a `main ( )` function that gets values from the user to test this function.
- Q2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates. Write a program that uses a structure called `point` to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:
- ```
Enter coordinates for P1:      3  4
Enter coordinates for P2:      5  7
Coordinates of P1 + P2 are :   8, 11
```
- Q 3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a `switch` statement to select the operation). Finally it should display the result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might look like this.
- ```
Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, second number 12 + 100
Answer = 112
Do another (Y/ N) ? N
```
- Q4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure `phone`. Create two structure variables of type `phone`. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:
- ```
Enter your area code, exchange, and number: 415 555 1212
My number is (212) 767-8900
Your number is (415) 555-1212
```
- Q 5. Create two classes `DM` and `DB` which store the value of distances. `DM` stores distances in metres and centimeters and `DB` in feet and inches. Write a program that can read values for the class objects and add one object of `DM` with another object of `DB`. Use a friend function to carry out the addition operation. The object that stores the results maybe a `DM` object or `DB` object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on the object on display.
- Q 6. Create a class `rational` which represents a numerical value by two double values- `NUMERATOR` & `DENOMINATOR`. Include the following public member Functions:
- constructor with no arguments (default).
  - constructor with two arguments.
  - `void reduce( )` that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
  - Overload `+` operator to add two rational number.
  - Overload `>>` operator to enable input through `cin`.

- Overload << operator to enable output through cout.  
Write a main ( ) to test all the functions in the class.

Q 7. Consider the following class definition

```
class father {
    protected : int age;
    public;
    father (int x) {age = x;}
    virtual void iam ( )
    { cout << "I AM THE FATHER, my age is : "<< age<< endl;}
};
```

Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar but appropriate messages. You should also define suitable constructors for these classes. Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.

Q 8. Write a program that creates a binary file by reading the data for the students from the terminal.

The data of each student consist of roll no., name ( a string of 30 or lesser no. of characters) and marks.

Q9. A hospital wants to create a database regarding its indoor patients. The information to store include

- Name of the patient
- Date of admission
- Disease
- Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the age of the patients. List the information about all the pediatric patients (less than twelve years in age).

Q 10. Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**. Add an instance variable, named department, of type string. Supply a method to **toString** that prints the manager's name, department and salary. Make a class **Executive** inherit from **Manager**. Supply a method to **String** that prints the string "**Executive**" followed by the information stored in the **Manager** superclass object. Supply a test program that tests these classes and methods.

Q11. Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals.

Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC key should cause the program to print out the total cars and total cash and then exit.

Q12. Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit ( ) as an argument.

Write a program to exercise reversit ( ). The program should get a string from the user, call reversit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba".

Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the forEach ( ) function and a user written display function. Then search the Deque for a particular string, using the first That ( ) function and display any strings that match. Finally remove all the items from the Deque using the getLeft ( )

function and display each item. Notice the order in which the items are displayed: Using `getLeft ( )`, those inserted on the left (head) of the Deque are removed in “last in first out” order while those put on the right side are removed in “first in first out” order. The opposite would be true if `getRight ( )` were used.

Q 14. Create a base class called `shape`. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called `triangle` and `rectangle` from the base `shape`. Add to the base class, a member function `get_data ( )` to initialize base class data members and another member function `display_area ( )` to compute and display the area of figures. Make `display_area ( )` as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle =  $x * y$

Area of triangle =  $\frac{1}{2} * x * y$

**B.TECH. WEEKEND SEMESTER- III**  
**ECE(W)- 221 : DIGITAL ELECTRONICS LAB**  
**(COMMON TO ECE, CSE, EE)**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF EXPERIMENTS:**

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T & D type flip flops.
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
  1. Design a 4-bit shift-register and verify its operation. Verify the operation of a ring counter and a Johnson counter.

**NOTE :** At least ten experiments are to be performed, atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 202 : PRINCIPALS OF SOFTWARE ENGINEERING**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction:** The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

**Unit-2 : Software project management:**Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

**Unit-3 :** Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

**Unit-4: System Design:** Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation.

**Architectural Design:** Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs ,architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

**Unit-5 : Testing and maintenance:** Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments ,architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering , reverse engineering ,restructuring, forward engineering.

**Unit-6 : Software Reliability and Quality Assurance :** Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management.

**Unit-7: Computer Aided software Engineering:** CASE, building blocks, integrated case environments and architecture, repository.

**TEXT BOOK:**

1. Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.

**REFERENCE BOOKS:**

1. Fundamentals of software Engineering, Rajib Mall, PHI

2. Software Engineering by Ian Sommerville, Pearson Edu, 5<sup>th</sup> edition, 1999, AW,
3. Software Engineering – David Gustafson, 2002, T.M.H
4. Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 , JW&S,
5. An Integrated Approach to software engineering by Pankaj Jalote , 1991 Narosa,

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 204 : PRINCIPLES OF OPERATING SYSTEM**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction:** Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

**Unit-2: Process Management:** Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

**Unit-3: Memory Management:** Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

**Unit-4: File System:** Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

**Unit-5: Process-Synchronization & Deadlocks:** Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

**Unit-6: I/O Systems:** I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

**Unit-7: Unix System And Windows NT Overview:** Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system.

**TEXT BOOKS:**

1. Operating System Concepts by Silberchatz et al, 5<sup>th</sup> edition, 1998, Addison-Wesley.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings, 4<sup>th</sup> edition, 2001, Prentice-Hall

**REFERENCE BOOKS:**

1. Operating System by Peterson, 1985, AW.
2. Operating System by Milankovic, 1990, TMH.
3. Operating System Incorporating With Unix & Windows By Colin Ritchie, 1974, TMH.
4. Operating Systems by Mandrik & Donovan, TMH
5. Operating Systems By Deitel, 1990, AWL.
6. Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 206 : COMPUTER GRAPHICS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction to Computer Graphics:** What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

**Unit-2: Two/Three Dimensional Viewing:** The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

**Unit-3: Viewing in 3D:** Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

**Unit-4: Hidden surface removal:** Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

**Unit-5: Representing Curves and Surfaces:** Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

**Unit-6: Illumination, shading, image manipulation:** Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

**TEXT BOOKS:**

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addison Wesley.
2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2<sup>nd</sup> Edition, 1999, PHI

**REFERENCE BOOKS:**

1. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
2. Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addison Wesley.
3. Computer Graphics: Secrets and Solutions by Corrign John, BPB
4. Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
5. Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
6. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 208 : SYSTEM PROGRAMMING & SYSTEM ADMINISTRATION**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1:** Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.

**Unit-2: Compiler:** Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

**Unit-3:** Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.

**Unit-4: Theoretical Concept of Unix Operating System:** Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

**Unit-5: Getting Started with Unix:** User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.

**Unit-6: Test Manipulation:** Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

**Unit-7:** Shell Programming: Programming in the Borne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.

**Unit-8:** System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager.  
Overview of the linux. operating system

**TEXT BOOKS:**

1. Systems Programming by Donovan, TMH.
2. The unix programming environment by Brain Kernighen & Rob Pike, 1984, PHI & Rob Pike.
3. Design of the Unix operating system by Maurich Bach, 1986, PHI.
4. Introduction to UNIX and LINUX by John Muster, 2003, TMH.

**REFERENCE BOOKS:**

1. Advanced Unix programmer's Guide by Stephen Prato, BPB
2. Unix- Concept and applications by Sumitabha Das, 2002, T.M..H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 224 : OPERATING SYSTEM LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Study of WINDOWS 2000 Operating System.
2. Administration of WINDOWS 2000 (including DNS,LDAP, Directory Services)
3. Study of LINUX Operating System (Linux kernel, shell, basic commands pipe & filter commands).
4. Administration of LINUX Operating System.
5. Writing of Shell Scripts (Shell programming).
6. AWK programming.

**B.TECH. WEEKEND SEMESTER- IV**  
**CSE(W)- 226: COMPUTER GRAPHICS LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for circle drawing as Raster Graphics Display.
3. Write a program for polygon filling as Raster Graphics Display
4. Write a program for line clipping.
5. Write a program for polygon clipping.
6. Write a program for displaying 3D objects as 2D display using perspective transformation.
7. Write a program for rotation of a 3D object about arbitrary axis.
8. Write a program for Hidden surface removal from a 3D object.

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- V**  
**CSE(W)- 301 : WEB DEVELOPMENT**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1:** Introduction to the Internet, The world wide web: The idea of hypertext and hyper media; How the web works-HTTP, HTML and URLs; How the browser works-MIME types, plugins and helper applications; The standards-HTML, XML, XHTML and the W3C.

Hypertext markup language: The anatomy of an HTML document; Marking up for structure and style: basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, nesting and targeting.

Descriptive markup: Meta tags for common tasks, semantic tags for aiding search, the doubling code and RDF.

**Unit-2: Separating style from structure with style sheets:** Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Client side programming: Introduction to the JavaScript syntax, the JavaScript object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields, and images; Applications.

**Unit-3: Server side programming:** Introduction to Server Side Technologies CGI/ASP/JSP., Programming languages for server Side Scripting, Configuring the server to support CGI, applications; Input/ output operations on the WWW, Forms processing, (using PERL/VBSCRIPT/JavaScript)

**Unit-4: Other dynamic content technologies:** Introduction to ASP & JSP, Delivering multimedia over web pages, The VRML idea, The Java phenomenon-applets and servlets, issues and web development.

**Unit-5:** Introduction to Microsoft .NET Technology and its comparison with the competing Technologies.

**TEXT BOOKS:**

1. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & ted Wugofski, 2000, WROX press (Indian Shroff Publ. SPD) 1<sup>st</sup> edition
2. HTML & XHTML: The Definitive Guide by Chuck Musciano, Bill Kennedy, 2000, 4<sup>th</sup> Edi.

**REFERENCE BOOKS:**

1. XHTML Black Book by Steven Holzner, 2000
2. CGI Programming on the World Wide Web. O'Reilly Associates.
3. Web Technologies By Achyut S Godbole , Atul Kahate, 2003, T.M.H
4. Scott Guelich, Shishir Gundararam, Gunther Birzniek; CGI Programing with Perl 2/e O'Reilly.
5. Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web services, O'Reilly.
6. Intranets by James D.Cimino, 1997, Jaico Publ.
7. Internet and Web Technologies – Raj Kamal, 2002, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- V**  
**CSE(W)- 303 : SOFTWARE PROJECT MANAGEMENT**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction to Software Project Management (SPM):** Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

**Unit-2: Stepwise Project planning:** Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/publicize plan.

**Unit-3: Project Evaluation & Estimation:** Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery. Albrecht function point analysis.

**Unit-4: Activity planning & Risk Management:** Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.  
Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values.

**Unit-5: Resource allocation & Monitoring the control:** Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.  
Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

**Unit-6: Managing contracts and people:** Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises.

**Unit-7: Software quality:** Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.

Unit-8: Study of Any Software Project Management software: viz Project 2000 or equivalent

**TEXT BOOKS:**

1. Software Project Management (2<sup>nd</sup> Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

**REFERENCE BOOKS:**

1. Software Engineering – A Practitioner’s approach, Roger S. Pressman (5<sup>th</sup> edi), 2001, MGH
2. Software Project Management, Walker Royce, 1998, Addison Wesley.
3. Project Management 2/c. Maylor
4. Managing Global software Projects, Ramesh, 2001, TMH.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- V**  
**ECE(W)- 303 : MICROPROCESSORS AND INTERFACING**  
**(COMMON WITH ECE, CSE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**PART A**

**UNIT-1: THE 8085 PROCESSOR** :Introduction to microprocessor, 8085 microprocessor: Architecture, instruction set, interrupt structure, and assembly language programming.

**UNIT-2: THE 8086 MICROPROCESSOR ARCHITECTURE:** Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

**UNIT-3: INSTRUCTION SET OF 8086:**Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

**PART B**

**UNIT-4: INTERFACING DEVICE** : The 8255 PPI chip: Architecture, control words, modes and examples.

**UNIT-5: DMA** : Introduction to DMA process, 8237 DMA controller,

**UNIT-6: INTERRUPT AND TIMER** : 8259 Programmable interrupt controller, Programmable interval timer chips.

**TEXT BOOKS :**

1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

**REFERENCE BOOKS:**

1. Microprocessors and interfacing : Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn A Gibson; PHI.
4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

**NOTE:** 8 questions are to be set selecting FIVE questions from PART A and THREE questions from PART- B .Students have to attempt any five questions.

**B.TECH. WEEKEND SEMESTER- V**  
**CSE(W)- 305 : COMPUTER NETWORKS**  
**(COMMON WITH CSE, ECE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: OSI Reference Model and Network Architecture:** Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

**Unit-2: TCP/IP:** Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol, User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP, IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

**Unit-3: Local Area Networks:** Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

**Unit-4: Wide Area Networks:** Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay, Wireless Links.

**Unit-5: Introduction to Network Management:** Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

**TEXT BOOK:**

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

**REFERENCE BOOKS:**

1. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
2. Business Data Communications, Fitzgerald Jerry,.
3. Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2<sup>nd</sup> Edition
4. Computer Networking – ED Tittel, 2002, T.M.H.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- V**  
**CSE(W)-321 : WEB DEVELOPMENT & CORE JAVA LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Java programs using classes & objects and various control constructs such as loops etc , and data structures such as arrays , structures and functions.
2. Java programs for creating Applets for display of Images ,Texts and Animation
3. Programs related to interfaces & packages
4. Input output & Random files programs in java
5. Java programs using Event driven concept
6. Programs related to Network Programming
7. Development of Web site for the college or newspaper agency.

**TEXT BOOKS (for Lab):**

1. Java Elements – Principles of Programming in Java , Duane A. Bailey , Duane W. Bailey, 2000, T.M.H
2. The Java Handbook by Patrick Naughton, TMH, N.Delhi

**B.TECH. WEEKEND SEMESTER- V**  
**ECE(W)-323 : MICROPROCESSORS AND INTERFACING LAB**  
**(COMMON WITH ECE, CSE)**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF EXPERIMENTS:**

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :
  - a. Addition of two 8-bit numbers.
  - b. Addition of two 8-bit numbers (with carry).
3. Write a program using 8085 and verify for :
  - a. 8-bit subtraction (display borrow)
  - b. 16-bit subtraction (display borrow)
4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.
6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.
7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.
8. Study of 8086 microprocessor kit
9. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double Word division and verify.
10. Write a program using 8086 for finding the square root of a given number and verify.
11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.
12. Write a program using 8086 and verify for:
  - a. Finding the largest number from an array.
  - b. Finding the smallest number from an array.
13. Write a program using 8086 for arranging an array of numbers in descending order and verify.
14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.
15. Write a program for finding square of a number using look-up table and verify.
16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.
17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

**NOTE:** At least ten experiments have to be performed in the semester out of which seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus of ECE(W)-303.

**B.TECH. WEEKEND SEMESTER- V**  
**CSE(W)-325 : NETWORK PROGRAMMING LAB**  
**(COMMON WITH CSE, ECE)**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

The socket programming can be done on Unix/Linux operating or/and Windows. Socket programming, and the language can be C/C++ and/or Java

1. Write a program to Create Sockets For Sending And Receiving Data.
2. Write a program to Obtain The Local & Remote Socket Address.
3. Write a program to Create Sockets For Handling Multiple Connection
4. Write a program to Obtain The Information About The (A) Host (B) Network (C) Protocols (D) Domains
5. Write a program to Manipulate The IP Address.
6. Write a program to Write A Telnet Client.
7. Write a program to Make An FTP Client

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- VI  
CSE(W)- 302 : NEURAL NETWORKS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Overview of biological neurons:** Structure of biological neurons relevant to ANNs.

**Unit-2: Fundamental concepts of Artificial Neural Networks:** Models of ANNs; Feedforward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner-take all learning rule, etc.

**Unit-3: Single layer Perception Classifier:** Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearly separable classifications.

**Unit-4: Multi-layer Feed forward Networks:** linearly non-separable pattern classification, Delta learning rule for multi-perceptron layer, Generalized delta learning rule, Error back-propagation training, learning factors, Examples.

**Unit-5: Single layer feed back Networks:** Basic Concepts, Hopfield networks, Training & Examples.

**Unit-6: Associative memories:** Linear Association, Basic Concepts of recurrent Auto associative memory: retrieval algorithm, storage algorithm; Bidirectional associative memory, Architecture, Association encoding & decoding, Stability.

**Unit-7: Self organizing networks:** Unsupervised learning of clusters, winner-take-all learning, recall mode, Initialization of weights, separability limitations

**TEXT BOOK:**

1. Introduction to artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

**REFERENCE BOOKS:**

1. "Neural Networks :A Comprehensive formulation", Simon Haykin, 1998, AW
2. "Neural Networks", Kosko, 1992, PHI.
3. "Neural Network Fundamentals" – N.K. Bose , P. Liang, 2002, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VI**  
**CSE(W)- 304 : INTELLIGENT SYSTEMS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Foundational issues in intelligent systems:** Foundation and history of AI, Ai problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A \* algorithm AO\* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

**Unit-2:** Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

**Unit-3:** Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempster shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

**Unit-4:** Planning, planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, I earning by analogy, explanation based learning, neural nets, genetic algorithms.

**Unit-5:** Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

**TEXT BOOK:**

1. Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

**REFERENCE BOOKS:**

1. Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
2. Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
3. Artificial intelligence, Patrick Henry Winston., 1992, Addition Wesley 3<sup>rd</sup> Ed.,

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VI**  
**ECE(W)- 304 : DIGITAL SYSTEM DESIGN**  
**(COMMON WITH ECE , CSE, EE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-1: Introduction:** to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

**UNIT- 2: VHDL Statements:** Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.

Subprograms: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

**UNIT-3: Combinational circuit design:** VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

**UNIT- 4: Sequential circuit design:** SEQUENTIAL CIRCUITS DESIGN :VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

**UNIT- 5: Design of Microcomputer:** Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

**UNIT-6: Design with CPLDs and FPGAs :**

Programmable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

**REFERENCE BOOKS:**

1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDL and Synthesis : KC Chang; IEEE Computer Society Press.
3. "A VHDL Primer" : Bhasker; Prentice Hall 1995.
4. "Digital System Design using VHDL" : Charles. H.Roth ; PWS (1998).
5. "VHDL-Analysis & Modelling of Digital Systems" : Navabi Z; McGraw Hill.
6. VHDL-IV Edition :Perry; TMH (2002)
7. "Introduction to Digital Systems" : Ercegovic. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
9. Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).

**NOTE :** Eight questions are to be set - at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VI**  
**CSE(W)- 306 : ADVANCED COMPUTER ARCHITECTURE**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Architecture And Machines:** Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing.

**Unit-2: Time, Area And Instruction Sets:** Time, cost-area, technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix

**Unit-3: Cache Memory Notion:** Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the Tcycle in V-R Translation, studies. Design summary.

**Unit-4: Memory System Design:** The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed-queue models, waiting time, performance, and buffer size, review and selection of queueing models, processors with cache.

**Unit-5: Concurrent Processors:** Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.

Shared Memory Multiprocessors: Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors.

**TEXT BOOK:**

1. Advance computer architecture by Hwang & Briggs, 1993, TMH.

**REFERENCE BOOKS:**

1. Pipelined and Parallel processor design by Michael J. Flynn – 1995, Narosa.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VI**  
**CSE(W)-324 : INTELLIGENT SYSTEM LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

1. Study of PROLOG.

Write the following programs using PROLOG.

2. Write a program to solve 8 queens problem.
3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis.
7. Solve traveling salesman problem.

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- VI**  
**ECE(W)-324 : DIGITAL SYSTEM DESIGN LAB**  
**(COMMON WITH ECE, CSE, EE)**

L T P Credits  
- - 2 3

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF EXPERIMENTS:**

1. Design all gates using VHDL.
2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
  - a. half adder
  - b. full adder
3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
  - a. multiplexer
  - b. demultiplexer
4. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
  - a. decoder
  - b. encoder
5. Write a VHDL program for a comparator and check the wave forms and the hardware generated
6. Write a VHDL program for a code converter and check the wave forms and the hardware generated
7. Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated
8. Write a VHDL program for a counter and check the wave forms and the hardware generated
9. Write VHDL programs for the following circuits, check the wave forms and the hardware generated  
Register shift register
10. Implement any three (given above) on FPGA/CPLD kit

**NOTE :** Ten experiments are to be performed out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

**B.TECH. WEEKEND SEMESTER- VI**  
**CSE(W)-328 : VISUAL PROGRAMMING LAB**

L T P Credits  
- - 2 3

Class Work : 50 Marks  
Exam. : 25 Marks  
Total : 75 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Study of Visual Basic 6.0.NET and Visual C++ 6.0.NET.
2. Study Windows API's. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.
3. Get familiar with essential classes in a typical (Document- view architecture) VC++ Program and their relationship with each other.
4. Create an SDI application in VC++ that adds a popup menu to your application which uses File drop down menu attached with the menu bar as the pop-up menu. The pop-up menu should be displayed on the right click of the mouse.
5. Create an SDI application in VC++ using which the user can draw atmost 20 rectangles in the client area. All the rectangles that are drawn should remain visible on the screen even if the window is refreshed. Rectangle should be drawn on the second click of the left mouse button out of the two consecutive clicks. If the user tries to draw more than 20 rectangles, a message should get displayed in the client area that " No more rectangles can be drawn"
6. Create an application in VC++ that shows how menu items can be grayed, disabled and appended at run time.
7. Write a program in VC++ to implement serialization of inbuilt and user defined objects.
8. Write a program in VC++ to create archive class object from CFile class that reads and stores a simple structure (record).
9. Make an Active X control in VC++ derived from a standard control.
10. Write a program in VB to implement a simple calculator.
11. Create a simple database in MS Access Database /Oracle and a simple database application in VB that shows database connectivity through DAO and ADO.
12. Write a simple program that displays an appropriate message when the illegal operation is performed using error handling technique in VB.
13. Write a program in VB to create a notepad.
14. Create a DLL in VB.
15. Bright students may do the following exercises:
16. Write a program in VC++ to implement a simple calculator.
17. Write a program in VC++ to create a static link library and a dynamic link library.
18. Create a simple database in MS Access Database and a simple database application in VC++ that shows database connectivity through ADO model.
19. Make an Active X control of your own using VB.
20. With the help of VB, create an object of excel application and implement any action on it.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)- 401 : MULTIMEDIA TECHNOLOGIES**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Basics of Multimedia Technology:** Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

**Unit-2: Image Compression & Standards:** Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

**Unit-3: Audio & Video:** Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

**Unit-4: Virtual Reality:** Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.  
Applications of environment in various fields.

**TEXT BOOKS:**

1. An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
2. multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

**REFERENCE BOOKS:**

1. Multimedia: Production, planning and delivery, Villamil & Molina, Que, 1997
2. Multimedia on the PC, Sinclair, BPB
3. Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
4. Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
5. Multimedia in Practice by Jeff coate Judith, 1995, PHI.
6. Multimedia Systems by Koegel, AWL
7. Multimedia Making it Work by Vaughar, etl.
8. Multimedia Systems by John .F. Koegel, 2001, Buford.
9. Multimedia Communications by Halsall & Fred, 2001, AW.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)- 403 : COMPILER DESIGN**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction To Compilers:** Compilers and translators, need of translators, structure of compiler :its different phases, Compiler construction tools.

**Unit-2: Lexical Analysis:** Role of lexical analyzer, design of lexical analyzer, regular expressions , Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

**Unit-3: Syntax Analysis:** Role of parsers, context free grammars, definition of parsing.

**Unit-4: Parsing Technique:** Shift- reduce parsing, operator precedence parsing, top down parsing, predictive parsing.

**Unit-5:** LR parsers, SLR, LALR and Canonical LR parser.

**Unit-6: Syntax Directed Translations:** Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, three address code, quadruples and triples.

**Unit-7: Symbol Table & Error Detection And Recovery:** Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

**Unit-8: Code Optimization & Code Generation:** Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

**TEXT BOOKS:**

1. Compilers Principle, Techniques & Tools - Alfredd V. AHO, Ravi Sethi & J.D. Ullman; - 1998Addison Wesley.
2. Compiler Design by O.G. Kakde, 1995, Laxmi Publ.

**REFERENCE BOOKS:**

1. Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
2. System software by Dhamdae, 1986, MGH.
3. Principles of compiler Design, Narosa Publication

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**HUM(W)- 451: LANGUAGE SKILLS FOR ENGINEERS (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

The real challenge before the students starts when they cross the threshold of the college after completing their degree. They, all of a sudden, find themselves competing for job/ P.G. Degrees, through various entrance tests and interviews. Verbal ability forms a major portion of these tests. Without sound language skills and its semantic-syntactic know-how, the students with engineering background find themselves almost under- prepared for such tests. With this difficulty of students in mind, this course is proposed to make them technically proficient in handling the language skills required in competitive exams. The course would expose students to almost all variety of items, the common run of such tests as CAT, GMAT etc. And in the context of LPG, this cutting edge competence becomes imperative, and no professional education can afford to overlook this aspect.

**COURSE CONTENT:**

**UNIT-1: Remedial English:** Parts of speech; Gerunds, participles and infinitives; Clauses; Sentence-constructions (unity; avoidance of choppy and rambling sentences, logic and consistency, conciseness, sequencing of ideas); Sentence errors - agreement between verb and subject, pronoun and antecedents, sequence of tenses, problems involving modifiers (dangling and misplaced modifiers); Shifts in point of view - consistency of number and person, tense, mood, voice and subject; Parallelism; Omissions and mixed constructions.

**UNIT – 2: Vocabulary:** Methods of building vocabulary - etymological roots, prefixes and suffixes; Commonly used foreign words and phrases; spelling; words often confused; synonyms and homonyms; one word substitutes; verbal idioms.

**UNIT- 3: Punctuation and Mechanics:** End Punctuation; Internal Punctuation; Word Punctuation.

**UNIT- 4: Comprehension:** Abstracting; Summarising; Observations, Findings and Conclusions; Illustration and Inductive Logic; Deduction and Analogy.

**UNIT- 5: Presentation:** Oral presentation - Extempore, discussion on topics of contemporary relevance, interviews.

**SUGGESTED READING:**

1. Working with Words by R.Gairns and S.Redman, Cambridge University Press, London.
2. Meanings into Words – Upper Intermediate Students Book, Doff/Jones, Foundation Books (Cambridge university Press), Delhi.
3. A Practical English Grammar by A.J. Thomson and A.V. Martinet, OUP, Delhi.
4. Examine your English by Margaret M. Maison, Orient Longman, New Delhi.
5. A Practical Guide to Colloquial Idiom by W.J. Ball, Longman.
6. A guide to Correct English by L.A. Hill, Oxford.
7. 7.Structural Essentials of English by H. Whitehall, Longman.
8. Advanced English Practice by B.D. Graver, OUP. Delhi.
9. 9.Public Speaking, Sudha Publication Pvt. Ltd., New Delhi.
10. 10.Group Discussion, Sudha Publication Pvt. Ltd., New Delhi.

**SCHEME OF EXAMINATION:**

**(A) THEORETICAL:**

The pattern of the exam would be more or less like the pattern of the competitive exams. (i.e., OBJECTIVE TYPE) like CAT G-MAT etc., as far as the units I, II, III and IV are concerned.

**Unit-I, II, III: (30,20,10 Marks respectively)**

The first section of the question paper will have 110 objective type questions with no choice at all. These 110(60+40+10) questions will cover all the first three units (I, II, III) of the syllabus and would carry 30,20 and 10 marks respectively. The questions may be in the form of multiple choices, fill-in-the-blank, supply the right word/choice, choose the right alternative, do as directed etc.

**Unit-IV: 20 Marks**

The question from this unit will test comprehension competence (in the form of various elements mentioned in the unit) of the text given.

**(B) PRACTICAL (Presentation):**

There will be an oral test carrying **20 marks**. The presentation part of the section i.e. Unit-V will be covered in this test. Hence, there is no need to include this unit in theory exam.

Three hours for a group of 15 students are required for this test. Test can be in the form of any of the activities mentioned in the Unit-V.

A panel of examiners appointed by the University will evaluate the presentation.

**B.TECH. WEEKEND SEMESTER- VII**  
**HUM(W)- 453: HUMAN RESOURCES MANAGEMENT (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-I : Understanding Organisational Behaviour:** Definition, Goals of Organisational behaviour. Key forces affecting Organisational Behaviour. Fundamental Concepts of Organisational Behaviour.

**Unit-II : Motivation:** Meaning, Objectives and importance of motivation. Theories of Motivation, Maslow's theory, Mc Greger's Theory Herzberg's theory.

Morale : Meaning; Factors affecting morale, types of morale morale and productivity, Evaluation of morale, improving morale.

**Unit-III : Communication :** Definition & importance of Communcation; Formal & informal communication, Barriers in communication.

**Unit-IV : Leadership :** Definition & importance, Nature of leadership various approaches to leadership styles.

**Unit-V:** Importance of human resources in industry, Definition of human resource management, mechanical approach towards personnel, Paternalism, Social system approach.

**Unit-VI :** Need for human resource planning, process of human resource planning, Methods of recruitment, Psychological tests and interviewing, Meaning and importance of placement, Meaning and techniques of induction. Training and development : Concepts of training and development, Importance of training and development, Management development its nature, purpose and method.

**Unit-VII:** Significant factors affecting compensation, Methods of wage payment, Wage differentials, Causes of difference in Wages, Types of wage differentials, Wage incentives, Meaning, Objectives, types of incentive plans.

**TEXT BOOKS :**

1. Human Resource and Personnel Management – K. Aswathappa – Tata McGraw Hill Publishing Company Ltd.
2. Personnel Management : C.B. Mamoria, Himalaya Publishing House.
3. Organisational Behaviour – Dr. L.M. Prasad (Sultan Chand & Sons).

**REFERENCE BOOKS :**

1. Personnel Management & Industrial Relations : Dr. T.N. Bhagoliwal : Sahitya Bhawan Agra.
2. Personnel Management : V.G. Karnik, Jaico Publishing House.
3. Personnel management & Industrial Relation: Tripathi: Sultan Chand & Sons.
4. Personnel Management – Arun Monappa & Mirza Saiyadain – Tata McGraw Hill Publishing Co. Ltd.
5. Personnel Management and Industrial Relations – D.C. Sharma & R.C. Sharma S.J. Publications.
6. Principles of Personnel Management – Edwin B. Flippo (McGraw Hill).
7. Organisational Behaviour – K. Adwathappa.
8. Organizational Behaviour – John W. Newsstorn & Keith Davis, Tata McGraw - Hill Publishing Company Limited, New Delhi.

Note: Eight questions are to be set at least one question from each unit and the students will have to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**HUM(W)- 455: ENTREPRENEURSHIP (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-I : Promotion of Entrepreneurship:** Meaning, definition and functions of an entrepreneur, qualities of a good entrepreneur; Role of Entrepreneur in economic development; Government measures for the promotion of small scale industries with special reference to Haryana; Cultural factors in developing entrepreneurship.

**UNIT-2: Ownership and Location of Industrial Units:** Different forms of Industrial Organisation., Theories of Industrial location. Process of preparing project reports.

**UNIT-3: Size of Firm and Pricing:** Concept of optimum firm, factors determining, Optimum size. Technical, Managerial, Marketing Uncertainties and risk., Pricing Methods, Policies and procedures.

**UNIT-4 : Financing of Small Industries :** Importance and need : Commercial Banks and term lending in India; Banks and under-writing of capital issues; Brief description about the role of other financial agencies viz; Industrial Finance Corporation of India. State Financial Corporation, Industrial Development Bank of India; Unit Trust of India.

**UNIT-5 : Problems Faced by Small Enterprises:** Problems connected with Marketing, Management of New Products; Power; Finance; Raw Material; Under-utilization of capacity; Causes of under – utilization; Rehabilitation of Sick Mills.

**UNIT-6 : Government and Business**

- (a) Highlights of Industrial Policy and Licensing Policy.
- (b) International Marketing with special reference to export documentation.

**Recommended Books :**

1. Entrepreneurship of Small Scale Industries – Deshpande Manohar D. (Asian Publishers,
2. Environment and Entrepreneur – Tandon B.C. (Asian Publishers, New Delhi).
3. The Industrial Economy of India – Kuchhal S.C. (Chaitanya, Allahabad).
4. Emerging Trends in Entrepreneurship Development Theories & Practices – Singh P.Narendra (International Founder, New Delhi)
5. Entrepreneur, Banker & Small Scale Industries – Bhattacharya Hrisnikes.
6. Entrepreneurship & Growth of Enterprise in Industrial Estates – Rao Gangadhara N.

**NOTE:** Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**HUM(W)- 457: BUSINESS COMMUNICATION (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

The course proposes to help students develop business and technical communication competence. It focuses on writing skills and strategies for specific purposes. The inevitability of introducing this course to Engineering students is embodied in that it has comparatively a high concentration of certain complex writing techniques and procedures.

**COURSE CONTENT:**

**Unit-I: Business correspondence:** Characteristics and Formats of Business letter; Quotations, Orders, Tenders, Sales letters, claim and adjustment letters, Credit and Collection letters, Application Letters for vacant situations with emphasis on Resumes and Curriculum Vitae; E-mail and Netiquette – format, style and tone.

**Unit-II: Business Reports and Proposals:** Importance, Function, Pattern and formats of Reports, Typical Business Reports, Report Organisation and Presentation, and Formal Reports; Proposal Formats, Writing problem-Solving Proposals, Executive Summary Proposals and project Proposals.

**Unit-III: Meetings:** Writing of Memorandum, Notes, Agenda and Minutes of Meeting.

**Unit-IV: Public Relations and Advertising Documents:** Press Releases, Public Service Announcements, Advertising Strategy and its objective, Designing of Classified and Display Advertising copies.

**SUGGESTED READING:**

1. Business Communication: Process & Product by Hary Ellen Guffey, IV Edition, South-Western College Publishing, Cincinnati.
2. Business Correspondence and Report Writing by R.C. Sharma & Krishna Mohan, Tata Macgraw Hill Publication, New Delhi.
3. Effective Business English and Correspondence by M.S. Ramesh and C.C. Pattanshetti, R. Chand & Co., New Delhi.
4. Effective Letters in Business by Robert by C. Shrueter, Tata Macgraw Hill, New Delhi.
5. English Business Letters by F.W. Wing & D. Annecree, Orient Longman.
6. Written Communication in English by Sarah Freeman, Orient Longman.
7. International Business English by Leo Jones & Richard Alexander, Cambridge University Press.
8. General and Business English by Sweet Stephen, Sir Issac Pitman & Sons Ltd., London.
9. How to Write and Present Technical Information, Charles H. Sides, Cambridge University Press, U.K.
10. 10.Strategies for Engineering communication, Susan Stevenson/Steve Whitmore, John Wiley and Sons, Inc. Printed in India by Replika Press Pvt. Ltd., Delhi.

## **SCHEME OF EXAMINATION:**

There will be six questions in all, covering all the units. All questions will be compulsory and will have enough internal choice.

### **Unit-I: 30 Marks**

There will be two questions from this unit. One question will cover the theoretical aspect of business letter writing and will carry 10 marks. The other question will be on writing the letter in a proper format on a subject given and will be of 20 marks. There will be enough choice taking care of the justice to be given to both the aspects of the letter writing.

### **Unit-II: 35 Marks**

There will be two questions from this unit. One question will cover the theoretical aspect of report/proposal writing and will carry 15 marks. The other question will be on preparing the report/proposal on a topic/subject given and will be of 20 marks. There will be enough choice taking care of the justice to be given to both the aspects of the report writing.

### **Unit-III: 15 Marks**

There will be a question on theoretical aspects of the various items of this unit or students can be asked to draft a specimen of any of these from the material given in the exam. The question can be split into parts.

### **Unit-IV: 20 Marks**

There will be one question having two parts. One part will be on theory and will be of 5marks and the other will require the drafting an advertisement copy of a product or service or a public announcement and will carry 15 marks.

**B.TECH. WEEKEND SEMESTER- VII**  
**PHY(W)-451: NANO TECHNOLOGY(Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-1: INTRODUCTION TO NANOTECH:** Crystalline-Non crystalline materials, Fundamental of Nanotechnology and Nanomaterials in Metals, other Materials, & Biosystem, Molecular Recognition, Quantum Mechanics and Quantum Ideas in Nanotechnology. Semiconductor Nanoparticles.

**UNIT- 2: PREPARATION AND CHARACTERIZATION OF NANOPARTICLES:** Nanoscale Lithography, Dip Pen Lithography, E-Beam Lithography, Nanosphere Life off, Lithography; Molecular Synthesis, Nanoscale Crystal Growth, Polymerization Nanobricks and Building blocks: Tools for Measuring Nanostructures – Scanning Probe Instrument, Spectroscopy, Electrochemistry, Election Microscope Tools to Make Nanostructure.

**UNIT-3: PROPERTIES & APPLICATION OF NANO CRYSTALLINE MATERIALS:** Application in Sensors, Nanoscale Biostructure Electronics, Magnets, Optics, Fabrication Biomedical Applications, Smart Materials – Self Healing Structures, Heterogenous Nanostructure and composites En Capsulation, Carbon Nanotubes.

**UNIT-4:** Synthesis of semiconductor Nanoclusters, Processing of Nanomaterials Nanobusiness – Boom, Bust and Nano Tech. NanoEthics

**REFERENCE BOOKS:**

1. Camarata, R.C. Nanomaterials synthesis, properties and application Institute of Physics Publication
2. Madou, Fundamentals of microfabrication, Mcgraw Hill.
3. Sibelia, J.P., A Guide to material characterization, Prentice Hall.
4. Mark Ratner, Daniel Ratner – NanoTechnology – A Gentle Introduction to the Next Big Idea.

**Note:** The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

**B.TECH. WEEKEND SEMESTER- VII**  
**PHY(W)-453: LASER TECHNOLOGY (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

Conditions for Producing Laser, Concept of coherence – Spatial and temporal, Population Inversions, Einstein coefficient, Gain and Gain saturation, Saturation intensity, Development and Growth of a Laser Beam, Exponential Growth factor, Threshold Requirement for a Laser.

Inversions and two-level systems, steady-state inversions and three and four-level systems. Transient Population Inversions, Factors effecting population inversion, Laser Amplifiers.

Excitation or Pumping Threshold Requirements, Pumping Pathways, Specific Excitation Parameters Associated with Optical and particle Pumping.

Helium-Neon Laser, Co<sub>2</sub> Laser, Ruby Laser, Semiconductor Diode Laser.

**RECOMMENDED BOOKS:**

1. Laser Fundamentals by William T. Silfvast Cambridge University, Press.
2. Introductory University Optics by John Beynon, (PHI)
3. Laser – B.B. Laud.
4. Optics – A.K. Ghatak (TMH)

**NOTE:** Eight questions will be set and students will be required to attempt any five questions in all. All questions will carry equal marks.

**B.TECH. WEEKEND SEMESTER- VII**  
**ME(W)-451: MECHATRONIC SYSTEMS (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-1:** Introduction to Mechatronics. Integrated design issues in Mechatronics, Conceptual design. Possible design solutions. Integrated approach for combining sensors, actuators, computer and the product. Some examples - like auto focus camers, engine combustion control, washing machine, vehicle suspensions, electro-mechanical brakes, manufacturing machine, industrial robots, air conditioning systems, etc..

**UNIT-2:** Classification of sensors of various type, resistive, strain gage, themistor, inductive, capacitive, piezoelectric, optical, photodetectors, encoders, ultrasonic types Silicon sensors, Micro-sensors for various measurements. Consideration for choice of sensors for a given application. Signal conditioning and data acquisition using computers. AD and DA converters. Use of plus-in-cards and software for acquiring data from several sensors.

**UNIT-4:** Mechanical actuation systems – kinematic chains, cams, gear trains, beld and chains drive, ratchet and prawl, bearing, guideways, ball screw and nut, etc. Electrical actuation systems: Operational characteristic and application of electrical actuation components for application like, AC/DC motors, stepper motors, relays, push buttons, switches, solenoids etc.

**UNIT-5:** Introduction to semiconductor electronics, junction diode, bipolar junction transistor, field effect transistors, digital logic. Number systems. Logic gates Boolean algebra. Application of logic gates. Combinational and sequential logic.

**UNIT-6:** Sequence control, relay ladder diagrams for sequence control in processes and machines. Programmable Logic Controlllers and applications: PLC structures, PLC languages, programming of PLC using Mnemonics, Interfacing PLC with actuators, Sequencing of cylinders. Timers, internal relays and counters. Open loop and closed loop control using PLC.

**UNIT-7:** Architecture of microprocessors and microcontrollers. Use of suitable software languages for micro controllers and their applications in mechatronic systems. Real time interfacing between computers and measurement or control systems. Introduction to modeling and computer control of process and mechanical systems.

**UNIT-8:** Communication systems Protocols, Open systems interconnection models. Smart transducers and transmitters. Field buses.

**TEXT BOOKS:**

1. Mechatronics – Electronic control in mechanical & electrical engineering by W.Bolton, Longman Indian Edn. 1999.
2. Mechatronic system design, by D.Shetty and R.A. Kolk – Mechatronic system design, PWS Publ. Co., Boston, 1997.
3. Mechatronics and Measurement Systems by D.G.Alciatore and M.B. Histan, TMH Publ. 2<sup>nd</sup> Edn. 2003.

**NOTE:** In the semester examination, the examiner will set 8 questions in all, and students will be required to attempt only 5 questions.

**REFERENCE BOOKS:** List Attached.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE (W)- 409: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**CONTENTS**

Introduction to Artificial intelligence: Scope, history & applications: AI as representation and search the predicate calculus inference rules. Logic based financial advisor, structures and strategies for state space search graph theory, strategies for space search, using state space to represent reasoning with the predicate calculus.

Heuristic Search: An algorithm for heuristic search, admissibility monotonicity and informed ness heuristics in games, complexity issues, control and implementation of state space search recursion based search, pattern directed search. Production systems, predicate calculus and planning the black board architecture for problems solving.

LISP and PROLOG: Knowledge representation languages issues in knowledge representation, network representation language, structured representations, introduction to LISP, Search in LISP: a functional approach to the farmer, Wolf, Goat and cabbage problem, higher order functions & procedural abstraction, search strategies in LIPS.

Expert systems: Introduction, History basic concepts, structure of expert systems, the human element in ES how ES works, problem areas addressed by ES, ES success factors, types of expert systems, ES and the internet interacts web, knowledge engineering, scope of knowledge, difficulties, in knowledge acquisition methods of knowledge acquisition, machine learning, intelligent agents, selecting an appropriate knowledge acquisition method, knowledge acquisition form multiple experts validation and verification of the knowledge base, analyzing coding, documenting & diagramming.

Expert systems- II, societal impacts reasoning in artificial intelligence, inference with rules, with frames: model based reasoning, case based rezoning, explanation & meta knowledge inference with uncertainty representing uncertainty probabilities and related approaches, theory of certainty (certainty factors) Qualitative reasoning, the development life cycle, phases I, II, III, IV, V, VI the future of expert system development process societal impacts.

**TEXT BOOKS:**

1. Efrain Turban and Jay E Aranson: Decision support systems & intelligent systems (5th Edn.) Prentice hall, 1998.
2. Donald A Waterman: A Guide to expert Systems, Addison -Wesley 1995
3. G.F. Luger & W.A Stubble Field -Artificial Intelligence structures and Strategies for complex problem solving, 3 rd Edn. Addison Wesley 1998.
4. E.Rich and Knight, Artificial Intelligence, Second Edn, Tata Mc. Graw Hill Publishing, 1981.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)- 204 : PRINCIPLES OF OPERATING SYSTEM (open elective)**  
**(OTHER THAN CSE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction:** Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

**Unit-2: Process Management:** Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

**Unit-3: Memory Management:** Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

**Unit-4: File System:** Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

**Unit-5: Process-Synchronization & Deadlocks:** Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

**Unit-6: I/O Systems:** I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

**Unit-7: Unix System And Windows NT Overview:** Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system.

**TEXT BOOKS:**

4. Operating System Concepts by Silberchatz et al, 5<sup>th</sup> edition, 1998, Addison-Wesley.
5. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
6. Operating Systems Internals and Design Principles by William Stallings, 4<sup>th</sup> edition, 2001, Prentice-Hall

**REFERENCE BOOKS:**

7. Operating System by Peterson, 1985, AW.
8. Operating System by Milankovic, 1990, TMH.
9. Operating System Incorporating With Unix & Windows By Colin Ritchie, 1974, TMH.
10. Operating Systems by Mandrik & Donovan, TMH
11. Operating Systems By Deitel, 1990, AWL.
12. Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**EE(W)- 455: INTELLIGENT INSTRUMENTATION FOR ENGINEERS (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-1:INTRODUCTION:** Intelligence, features characterizing intelligence, intelligent instrumentation system; features of intelligent instrumentation; components of intelligent instrumentation system; Block diagram of an intelligent instrumentation system.

**UNIT-2:SIGNAL PROCESSING, MANIPULATION AND TRANSMISSION:** Signal amplification & attenuation (OP-AMP based); Instrumentation Amplifier (circuit diagram, high CMRR & other features); Signal Linearization (different types such as Diode-resistor combination, OP-AMP based, etc.); Bias Removal, Signal filtering (outputs from ideal filters, outputs from constant-k filters, matching of filter sections, active analog filters); OP-AMP based Voltage-to-current converter, Current-to-voltage conversion, Signal integration, Voltage follower (pre-amplifier), voltage comparator, Phase-locked loop, Signal addition, Signal multiplication, Signal Transmission (Signal amplification, Shielding, Current loop transmission, Voltage-to-frequency conversion, Fiber optic transmission); Description of Spike Filter (software-based).

**UNIT-3:SMART SENSORS:** Primary sensors; Excitation; Compensation (Nonlinearty: look up table method, polygon interpolation, polynomial interpolation, cubic spline interpolation, Approximation & regression; Noise & interference; Response time; Drift; Cross-sensitivity); Information Coding/ Processing; Data Communication; Standards for smart sensor interface.

**UNIT-4: INTERFACING INSTRUMENTS & COMPUTERS:** Basic issues of interfacing; Address decoding; Data transfer control; A/D converter; D/A converter; Sample & hold circuit; Other interface considerations.

**UNIT-5:RECENT TRENDS IN SENSOR TECHNOLOGIES:** Introduction; Film sensors (Thick film sensors, Thin film sensors); Semiconductor IC technology – standard methods; Microelectro-mechanical systems (Micro-machining, some application examples); Nano-sensors.

**TEXT BOOKS:**

1. Barney, G.C., Intelligent Instruments. Hemel Hempstead: Prentice Hall, 1985.
2. Alan S. Morris, Principles of Measurement & Instrumentation. N. Delhi: PHI Pvt. Ltd., 1999..

**REFERENCE BOOKS:**

1. D. Patranabis, Sensors & Transducers. N. Delhi: PHI, 2003.
2. Roman Kuc, Introduction to Digital Signal Processing. N. York: McGraw-Hill Pub. Co.

**NOTES:** 1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.  
2. Use of scientific calculator will be allowed in the Exam. However, pager, programmable calculator & cellular phone etc. will not be allowed.

**B.TECH. WEEKEND SEMESTER- VII**  
**ECE (W)- 403: EMBEDDED SYSTEMS DESIGN (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT-1 : Introduction:** Different types of microcontrollers: Embedded microcontrollers, External memory microcontrollers; Processor Architectures: Harvard V/S Princeton , CISC V/S RISC; microcontrollers memory types; microcontrollers features : clocking, i/o pins, interrupts, timers, peripherals.

**UNIT-2: Microcontroller Architecture:** Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations, Addressing modes, CPU registers, Instruction set, simple operations.

**UNIT-3: Interrupts and I/O ports:** Interrupt logic, Timer2 scalar initialization, IntService Interrupt service routine, loop time subroutine, External interrupts and timers, Synchronous serial port module, Serial peripheral device, O/p port Expansion, I/p port expansion, UART.

**UNIT-4 : Software:** Development tools/ environments, Assembly language programming style, Interpreters, High level languages, Intel hex format object files, Debugging.

**UNIT- 5: Programming with microcontrollers:** Arithmetic operations, Bit addressing, Loop control, Stack operation, Subroutines, RAM direct addressing, state machines, Oscillators, Timer Interrupts, Memory mapped I/O.

**UNIT-6: Designing using microcontrollers:** Music box, Mouse wheel turning, PWM motor control, Aircraft Demonstration, ultra sonic distance measuring, Temperature Sensor, Pressure Sensor, Magnetic Field Sensor.

**TEXT BOOK:**

1. Design with PIC Microcontrollers by John B. Peatman , Pearson.

**REFERENCE BOOKS:**

1. Programming and Customizing the 8051 Microcontroller : Predko ; TMH.
2. Designing Embedded Hardware : John Catsoulis ;SHROFF PUB. & DISTR. ND.
3. Programming Embedded Systems in C and C++ : Michael Barr; SHROFF PUB. & DISTR. ND.

**B.TECH. WEEKEND SEMESTER- VII**  
**CHE(W)- 453 : POLLUTION AND CONTROL (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

Waster Water & its treatment Processes:-

Waster-water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

II Air Pollution:

Classification of air pollutants

Particulates: Physical characteristics, mode of formation, setting properties, Control measures.

Hydrocarbons: Nature; sources, control

Carbon Monoxide: Source, harmful effects on human health, control measures.

oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

Solid Waste: Types, sources and properties of solid waste, solid waste management – Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

**TEXT BOOKS / REFERENCE BOOKS :**

1. Environmental Engg.: by Howard s. Peavy & Others, MGH International.
2. Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K.DE, Wiley Eastern.
5. Air Pollution: H.C. Perking – Mc Graw Hill.

**NOTE:** Eight questions will be set and students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)- 411 : MANAGEMENT INFORMATION SYSTEM (Open Electives)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Foundation of Information System:** Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, MIS organization within company, Management information and the systems approach.

**Unit-2: Information Technology:** A manager's overview, managerial overviews, computer hardware & software, , DBMS, RDBMS and Telecommunication.

**Unit-3: Conceptual system design:** Define the problems, set systems objective, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, and prepare the conceptual design report.

**Unit-4: Detailed system design:** Inform and involve the organization, aim of detailed design, project management of MIS detailed design , identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, document the detailed design revisit the manager user.

**Unit-5: Implementation evaluation and maintenance of the MIS:** Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system, cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development .

**Unit-6: Advanced Concepts in Information Systems:** Enterprise Resources Management(ERP), Supply Chain Management, C R M , Procurement Management System.

**TEXT BOOKS:**

1. Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.
2. Information System for Modern Management (3<sup>rd</sup> edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI

**REFERENCE BOOKS:**

1. Management Information System; O Brian; TMH
2. Management Information System by Davis Olson Mac Graw Hill
3. Management Information System by Stasllings,(Maxwell Mc Millman Publishers)
4. Information System; a Management Perspective; Alter Addison Wesley
5. Introduction to Information System; McGraw Hill

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)- 401 : MULTIMEDIA TECHNOLOGIES (Open Elective)**  
**(OTHER THAN CSE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Basics of Multimedia Technology:** Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

**Unit-2: Image Compression & Standards:** Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

**Unit-3: Audio & Video:** Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

**Unit-4: Virtual Reality:** Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.  
Applications of environment in various fields.

**TEXT BOOKS:**

3. An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
4. multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

**REFERENCE BOOKS:**

10. Multimedia: Production, planning and delivery, Villamil & Molina, Que, 1997
11. Multimedia on the PC, Sinclair, BPB
12. Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
13. Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
14. Multimedia in Practice by Jeff coate Judith, 1995, PHI.
15. Multimedia Systems by Koegel, AWL
16. Multimedia Making it Work by Vaughar, etl.
17. Multimedia Systems by John .F. Koegel, 2001, Buford.
18. Multimedia Communications by Halsall & Fred, 2001, AW.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VII**  
**ECE(W)- 405 : WIRELESS COMMUNICATION**  
**(COMMON WITH ECE, CSE)**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT- 1: Introduction to wireless communication system:** Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

**UNIT-2: Modern wireless communication system:** Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

**UNIT-3: Introduction to cellular mobile system:** Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

**UNIT- 4: Cellular system design fundamentals:** Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

**UNIT-5: Multiple access technique for wireless communication:** Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

**UNIT- 6: Wireless Networking:** Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.

**UNIT- 7: Intelligent cell concept and application :**Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

**TEXT BOOKS:**

1. Wireless Communications: Theodore S. Rappaport; Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill

**REFERENCE BOOK:**

Mobile Communications: Jochen Schiller; Pearson

**NOTE:** Eight questions are to be set -one question from each unit. Students have to attempt any five question.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)-421 : MULTIMEDIA TECHNOLOGIES LAB**

L T P Credits  
- - 2 2

Class Work : 25 Marks  
Exam. : 25 Marks  
Total : 50 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Write a program to justify a text entered by the user on both the left and right hand side. For example, the text “ An architect may have a graphics program to draw an entire building but be interested in only ground floor”, can be justified in 30 columns as shown below. An architect may have a Graphics programs draw an Entric building but be interested in only ground floor.
2. Study the notes of a piano and stimulate them using the key board and store them in a file.
3. Write a program to read a paragraph and store it to a file name suggested by the author.
4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.
5. Write a program to show a bitmap image on your computer screen.
6. Create a web page for a clothing company which contains all the details of that company and at-least five links to other web pages.
7. Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination.
8. Write a program to simulate the game of pool table.
9. Write a program to simulate the game Mine Sweeper.
10. Write a program to play “wave” or “midi” format sound files.

**NOTE:** At least 5 to 10 more exercises to be given by the concerned department.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)-423 : COMPILER DESIGN LAB**

L T P Credits  
- - 2 3

Class Work : 50 Marks  
Exam. : 25 Marks  
Total : 75 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

1. Practice of LEX/YACC of compiler writing.
2. Write a program to check whether a string belong to the grammar or not.
3. Write a program to generate a parse tree.
4. Write a program to find leading terminals.
5. Write a program to find trailing terminals.
6. Write a program to compute FIRST of non-terminal.
7. Write a program to compute FOLLOW of non-terminal.
8. Write a program to check whether a grammar is left Recursion and remove left Recursion.
9. Write a program to remove left factoring.
10. Write a program to check whether a grammar is operator precedent.
11. To show all the operations of a stack.
12. To show various operations i.e. read, write and modify in a text file.

**NOTE** : At least 10 programs are required to be developed in the semester.

**B.TECH. WEEKEND SEMESTER- VII**  
**CSE(W)-425 : PROJECT**

L T P Credits  
- - 1 4

Class Work : 50 Marks  
Exam. : --  
Total : 50 Marks  
Duration of Exam : --

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

Project involving design/ fabrication/ testing/ computer simulation/ case studies etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

|                               |                    |
|-------------------------------|--------------------|
| Chairman of Department        | : Chairperson      |
| Project coordinator           | : Member Secretary |
| Respective project supervisor | : Member           |

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Computer Science & Information Technology.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 402 : ADVANCED JAVA**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**UNIT -1: Core JAVA:** Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AWT & Applet Programming.

**UNIT- 2: Networking:** Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming

**UNIT-3: Database Networking:** The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Matadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP

**UNIT- 4: Distributed objects:** The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP

**UNIT- 5: Swings :** Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers

**UNIT-6: AWT :** The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop

**UNIT- 7: JAVA Beans Components:** Beans, The Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Beaninfo Classes Property Editors Cuatomizes

**UNIT- 8: Security:** Class Loaders, Bytecode Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption

**TEXT BOOK:**

1. Core Java™ 2, Volume II-Advanced Features, 7<sup>th</sup> Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004

**REFERENCE BOOKS:**

1. Professional Java Programming by Brett Spell, WROX Publication
2. Advanced Java 2 Platform, How to Program, 2<sup>nd</sup> Edition, Harvey. M. Dietal, Prentice Hall

**NOTE:** Eight questions are to be set – at lease one from each unit Students have to attempt any five.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 404 : DISTRIBUTED OPERATING SYSTEM**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

Unit-1: Introduction: Introduction to Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client – Server model ,Remote Procedure Calls and Group Communication. Middleware and Distributed Operating Systems.

Unit-2: Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection .

Unit-3: Processes and Processors in distributed systems: Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

Unit-4: Distributed file systems: Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Unit-5: Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

**TEXT BOOK:**

Distributed Operating System – Andrew S. Tanenbaum, PHI.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 406: NETWORK SECURITY & MANAGEMENT**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

Unit-1: Introduction: Codes and Ciphers – Some Classical systems – Statistical theory of cipher systems-Complexity theory of crypto systems – Stream ciphers, Block ciphers.

Unit-2: Stream Ciphers: Rotor based system – shift register based systems – Design considerations for stream ciphers – Cryptanalysis of stream ciphers – Combined encryption and encoding. Block Ciphers – DES and variant, modes of use of DES.  
Public key systems – Knacksack systems – RSK – Diffie Hellman Exchange – Authentication and Digital signatures, Elliptic curve based systems.

Unit-3: System Identification and clustering: Cryptology of speech signals – narrow band and wide band systems – Analogue & Digital Systems of speech encryption.

Unit-4: Security: Hash function – Authentication: Protocols – Digital Signature standards.  
Electronics Mail Security – PGP (Pretty Good Privacy) MIME, data Compression technique.  
IP Security: Architecture, Authentication Leader, Encapsulating security Payload – Key Management.  
Web security: Secure Socket Layer & Transport Layer security, Secure electronics transactions.  
Firewalls Design principle, established systems.

Unit-5: Telecommunication Network Architecture, TMN management layers, Management information Model, Management servicing and functions, Structure of management information and TMN information model, SNMP v1, SNMP2 & SNMP3, RMON1 & 2, Broadband Network Management (ATM, HFC, DSL), ASN

**TEXT BOOKS:**

Cryptography and Network Security: Principal & Practices, 2<sup>nd</sup> Edition by Upper Saddle River, PHI  
Network Management Principles & Practices by Subramanian, Mani (AWL)  
SNMP, Stalling, Willian (AWL)

**REFERENCE BOOKS:**

SNMP: A Guide to Network Management (MGH)  
Telecom Network Management by H.H. Wang (MGH)  
Network Management by U. Dlack (MGH)

**NOTE:**Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 408 : DIGITAL IMAGE PROCESSING**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction and Fundamental to Digital Image Processing:** What is Digital Image Processing, Origin of Digital Image Processing, Examples that use Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling, quantization and representation, Basic relationship between pixels.

**Unit-2: Image Enhancement in the Spatial Domain & Frequency domain:** Background, Basic gray level transformation, Histogram processing, Basics of spatial filtering, Smoothing and Sharpening Spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform. Smoothing and Sharpening Frequency-Domain filters.

**Unit-3: Image Restoration:** Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

**Unit-4: Color Image Processing:** Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

**Unit-5: Image Compression:** Fundamentals, Image compression models, Error free compression, Lossy compression.

**Unit-6: Image Segmentation:** Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

**Unit-7: Representation, Description and Recognition:** Representation-chain codes, polygonal approximation and skeletons, Boundary descriptors-simple descriptors, shape numbers, Regional descriptors- simple, topological descriptors, Pattern and Pattern classes-Recognition based on matching techniques.

**Unit-8: Recognition:** Pattern and pattern Classes, Decision-Theoretic Methods.

**TEXT BOOK:**

1. Digital Image Processing by Rafael C.Gonzalez & Richard E. Woods –2002, Pearson Education

**REFERENCE BOOK:**

1. Digital Image Processing by A.K. Jain, 1995,-PHI

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 410 : ADVANCED DATABASE MANAGEMENT SYSTEMS**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Data Models:** EER model and relationship to the OO model, Object Oriented data model and ODMG standard, Other data models - NIAM, GOOD, ORM.

Query Optimisation: Query Execution Algorithms, Heuristics in Query Execution, Cost Estimation in Query Execution, Semantic Query Optimisation.

Database Transactions and Recovery Procedures: Transaction Processing Concepts, Transaction and System Concepts, Desirable Properties of a Transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL, Recovery Techniques, Database Backup, Concurrency control, Locking techniques for Concurrency Control, Concurrency Control Techniques, Granularity of Data Items.

**Unit-2: Client Server Computing:** Client Server Concepts, 2-Tier and 3-Tier Client Server Systems, Client/Server Architecture and the Internet, Client /Database Server Models, Technology Components of Client Server Systems, Application Development in Client Server Systems.

Distributed Databases: Reliability and Commit protocols, Fragmentation and Distribution, View Integration, Distributed database design, Distributed algorithms for data management, Heterogeneous and Federated Database Systems.

**Unit-3: Deductive Databases:** Recursive Queries, Prolog/Datalog Notation, Basic inference Mechanism for Logic Programs, Deductive Database Systems, Deductive Object Oriented Database Systems.

Commercial and Research Prototypes: Parallel database, Multimedia database, Mobile database, Digital libraries, Temporal database.

**TEXT BOOK:**

1. Fundamentals of Database Systems (3 edition), Elmasri R. and Navathe S.B., 2000, Addison Wesley, Low Priced Edition.

**REFERENCE BOOKS:**

1. Database System Concepts by A. Silbershatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.

**NOTE:** Eight questions will be set in all by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 412 : COMPUTER SOFTWARE TESTING**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-I: Introduction:** First ,second and later cycles of testing, Objectives and limits of testing, Overview of software development stages, Planning stages and testing during these stages, design stages and testing during these stages, Software errors and its their categories.

**Unit-II: Test planning ,processing , execution and reporting:** Preparing a test plan,deciding features to be tested/not tested , deciding test starategy, setting up test criteria,identifying responsibilities,staffing and training needs,identifying resource requirements, activity breakdown and communication schedule,  
*Test process:-* baselining a test plan,test case specification, update of traceability matrix, identifying possible cases for automation,collecting and analyzing Metrics,  
*Reporting and analyzing bugs:-*Problems reports,analysis and tactics for analyzing a reproducible bug, making a bug reproducible. ,p  
reparing test summary report, recommending product release criteria.

**Unit-III: Testing Methodologies :** White box testing ( static ,structural), challenges in white box testing, Black box testing ,Integration testing, system and acceptance testing , regression testing.

**Unit-IV: Test metrics and Measurements:** Why Metrics in testing,types of metrics,projects metrics,progress metrics,productivity metrics,Release metrics

**Unit-V: Testing of Object Oriented Systems :** Unit testing of a class, UMLsupport for integration testing of OO systems,regression testing of OO systems, Implications of Composition, Encapsulation,Inheritance,Polymorphism

**Unit-VI: Software Testing Excellence :** Best practices of S/w Testing, Test driven development, Test-Then-Code Cycles, Alpha,pre-beta,beta testing, Legal consequences of defective software

**TEXT BOOKS :**

1. Testing Computer Software , By Cem Kaner, Jack faalk,Hung Nguyen, publisher : International Thomson Computer Press( Comdex).
2. Software Testing, By Srinivasan Desikan, gapalawamy Ramesh, publisher :Pearson Education

**REFERENCE BOOK:**

1. Software Testing: A Craftsman's approach, Paul C. Jorgensen publisher : Auerbach publication

**NOTE:** Eight questions will be set in all by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 414 : HUMAN COMPUTER INTERACTION**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit- 1: Introductions & overview of HCI:** History of computer user interfaces, HCI - history and intellectual root, Human information processing limitations, human decision making. Human cognitive and sensory limits , Human memory , Human problem solving , Skill acquisition, Users' conceptual models (mental models) , Decision making

**Unit- 2: Computer systems and user interfaces, human-system interaction:** Input and output devices, Mechanics of particular devices, Speech input, sound and speech output, Computer architecture, Performance characteristics of humans and systems, Color issues, Computer graphics , Color representation, color maps, color range of devices

**Unit-3: Interaction models and metaphors:** Use of abstract metaphors for describing interface behavior, Use of metaphors to support user understanding, Dialog input and output techniques and purposes , Screen layout issues, Dialog interaction: types and techniques, navigation and orientation, multimedia and non-graphical dialogues, Dialog issues: response time, control, standards, look and feel , Layers model of architecture of design and windowing systems, Windows manager models, e.g., X, Macintosh, MS Windows, Hypermedia and WWW

**Unit--4: Principles guiding well-designed human-system interaction:** Paradigms for interaction, Principles to support usability, Accounting for users with disabilities

**Unit- 5: The design process – overview:** The typical software development lifecycle (idealized vs. actual), User-centered design overview, “Three pillars of design”, Usability engineering overview, Reconciling UCD and usability testing

**Unit- 6: The design process - task and user needs analysis:** Task analysis definition, Techniques for task analysis, Sources of information

**Unit -7: The design process:** making use of task and user data for system design. Use cases, scenarios, Structuring the information, Information architecture, User and process flows, Wireframes, Mockups, comps, Other methods of conveying structure and function

**Unit- 8: Designing for universal access:** What is accessibility? What is accessible software, Examples of accessibility adaptations, What's driving software accessibility, Implications for software organizations

**Unit -9: Speech user interfaces:** Attributes of speech user interfaces, Evaluating speech user interface quality

**Unit -10: HCI in mission-critical and high-risk environments:** Safety implications of human-computer interaction, Effects of automation, Addressing the effects

**TEXT BOOKS:**

1. Hackos, J.T. & Redish, J.C. (1998). User and task analysis for interface design. John New York: Wiley & Sons.
2. Norman, D. (1988). The design of everyday things. New York: Basic Books.

**REFERENCE BOOKS:**

1. Designing the User Interface: Strategy for Effective Human Computer Interaction, 3<sup>rd</sup> edition, Bel Shneiderman, Perason Edu. Publ. 2000

2. Human Computer Interaction Dix, A et al. Prentice Hall 1993
3. Graphical User Interface Design and Evaluation Redmond-Pyle, D. & Moore, A. Prentice Hall 1995
4. The Art of Human-Computer Interface Design Laurel, B Addison-Wesley 1990

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 416 : FUZZY LOGIC**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit – 1: Classical and Fuzzy Sets:** Overview of Classical Sets, Membership Function,  $\alpha$ -cuts, Properties of  $\alpha$ -cuts, Decomposition, Theorems, Extension Principle,

**Unit – 2: Operations on Fuzzy Sets:** Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations

**Unit – 3: Fuzzy Arithmetic:** Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

**Unit – 4: Fuzzy Relations:** Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations.

**Unit – 5: Possibility Theory:** Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory.

**Unit – 6: Fuzzy Logic:** Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

**Unit – 7: Uncertainty based Information:** Information & Uncertainty, Nonspecificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.

**Unit – 8:** Applications of Fuzzy Logic in soft computing.

**TEXT BOOKS / REFERENCE BOOKS:**

1. Fuzzy Sets, Uncertainty & Information by G.J.Klir & T.A. Folyger, PHI, 1988.
2. Fuzzy sets & Fuzzy logic by G.J.Klir & B.Yuan, PHI, 1995.

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 418 : NATURAL LANGUAGE PROCESSING**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Components of natural language processing:** lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosody & natural languages.

**Unit-2: Formal languages and grammars:** chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

**Unit-3: Computation linguistics: recognition and parsing of natural language structures:** ATN & RTN, General techniques of parsing: CKY, Earley & Tomitas algorithm.

**Unit-4:** Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

**Unit-5: Application of NLP:** intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

**TEXT BOOK:**

1. "Natural Language Understanding" James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

**REFERENCE BOOKS:**

1. "Language as a cognitive process", Terry Winograd 1983, AW
2. "Natural Language processing in prolog" G. Gazder, 1989, Addison Wesley.
3. " Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)- 420 : OBJECT ORIENTED SYSTEMS DEVELOPMENT**

L T P Credits  
3 - - 4

Class Work : 50 Marks  
Exam. : 100 Marks  
Total : 150 Marks  
Duration of Exam : 3 hrs.

**Unit-1: Introduction:** Review of the Traditional Methodologies, Advantages of Object Oriented Methodologies over Traditional Methodologies, Classes, Objects, Encapsulation, Association, Aggregation, Inheritance, Polymorphism, States and Transitions.

Visual Modelling using Unified Modelling Language (UML): What is Visual Modelling? ObjectOriented Modelling, Introduction to Unified Modelling Language (UML): History of UML, Overview of UML – Capabilities, Usage of UML.

Introduction to Rational Rose CASE tool: Introduction – Importance of Rational Rose, Capabilities of Rational Rose Case Tool.

**Unit-2: Introduction to Objectory Software Development Process:** Introduction, Benefits, Phases and Iterations, Elaboration Stage, Construction Stage, Transition Stage.

Creating Use Case Diagrams: Actors and Use Cases, Use Case Relationships, Types of Relationships, Use Case Diagrams: Creating Main Use Case -, Relationships - , Additional Use Case - Diagrams in Rational Rose, Activity Diagrams Activities, Transitions, Decision Points, Swimlanes

**Unit-3: Identifying Classes ,Packages and drawing a Class Diagram:** State, Behaviour, Identity of Objects, Stereotypes and Classes, Creating and Documenting Classes in rational Rose, Packages, Drawing a Class Diagram Specifying Relationships : The Need of Defining Relationships, Association and Aggregation Relationships, Naming Relationships, Role Names, Multiplicity Indicators, Reflexive Relationships, Package Relationships, Inheritance, Finding Relationships, Creating Relationships in Rational Rose

**Unit-4: Discovering Object Interactions:** Documenting Scenarios using Interaction Diagrams, Types of Interaction Diagrams, Adding Behaviour and Structure: Representing Behaviour and Structure, Creating Attributes & operations and documenting them, Displaying attributes and operations, Association Classes, Analysing Object Behaviour: Modelling Dynamic Behaviour, States

**Unit-5: Checking the Model:** Making the Model Homogeneous, Combining Classes, Splitting Classes, Eliminating Classes, Consistency Checking, Scenario Walk-through, Event Tracing, Documentation Review, Designing the System Architecture : The need for Architecture, The “4+1” view of Architecture, The Logical view, The Component View, The Process View, The Deployment View, The Use Case view.

**Unit-6: The Iteration Planning Process:** Benefits, Goals, Design the User Interface, Adding Design Classes, The Emergence of Patterns, Designing Relationships, Designing Attributes and Operations, Designing for Inheritance, Coding, Testing, and Documenting the Iteration.

**TEXT BOOKS:**

1. “UML User Guide”, Grady Booch, James Rumbaugh, Ivar Jacobson, 2000, Addison Wesley.
2. Visual Modeling with Rational Rose 2000 and UMLBy Terry Quatrani Foreword by Grady Booch, 2000

**REFERENCE BOOKS:**

1. “UML Reference Guide”, James Rumbaugh, Ivar Jacobson, Grady Booch, 2000, Addison Wesley.
2. “The Objectory Software Development Process”, Ivar Jacobson, Grady Booch, James Rumbaugh, 1999, Addison Wesley.
3. UML Distilled by Maxtin Fowler with Kendall Scott,2000 ,Second Edition
4. Sams Teach Yourself “UML” In 24 Hours By Joseph Schmuller ,2000

**NOTE:** Eight questions will be set in all by the examiners taking at least one question from each unit. students will be required to attempt five questions in all.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE(W)-422 : ADVANCED JAVA LAB**

L T P Credits  
- - 2 3

Class Work : 50 Marks  
Exam. : 50 Marks  
Total : 100 Marks  
Duration of Exam : 3 hrs.

**LIST OF PRACTICALS / DEMONSTRATIONS**

Development of programs relating to :

JDBC

Servlets

Beans

RMI

JSP

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE (W)-425 : PROJECT**

L T P Credits  
- - 1 8

Class Work : 50 Marks  
Exam. : 100  
Total : 150 Marks  
Duration of Exam : --

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

|                           |                                     |
|---------------------------|-------------------------------------|
| Chairperson of Department | : Chairperson                       |
| Project coordinator       | : Member                            |
| External expert           | : To be appointed by the University |

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Computer Science & Information Technology.

**B.TECH. WEEKEND SEMESTER- VIII**  
**CSE (W) - 442: SEMINAR**

L T P Credits  
- - 1 2

Class Work : 50 Marks  
Exam. : --  
Total : 50 Marks  
Duration of Exam : --

The objectives of the course remains

- To learn how to carryout literature search
- To learn the art of technical report writing
- To learn the art of verbal communication with the help of modern presentation techniques

A student will select a topic in emerging areas of Engineering & Technology and will carry out the task under the observation of a teacher assigned by the department.

He/ She will give a seminar talk on the same before a committee constituted by the chairperson the department. The committee should comprise of three faculty members from different specializations. The teacher associated in the committee will be assigned 2 hours teaching load per week.

However, guiding students' seminar will not be considered towards teaching load.

The format of the cover page and the organization of the body of the seminar report for all the undergraduate programs will be finalized and circulated by the Dean, Faculty of Engineering and Technology.



**B.TECH. WEEKEND SEMESTER- VIII**  
**GPCSE (W)- 402: GENERAL FITNESS FOR THE PROFESSION**

L T P Credits  
- - - 4

Class Work : --  
Exam. : 100 Marks  
Total : 100 Marks  
Duration of Exam : --

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

The evaluation will be made by the committee of examiners constituted as under:

- |                                              |                             |
|----------------------------------------------|-----------------------------|
| 1. Dean, Faculty of Engineering & Technology | Chairperson                 |
| 2. Chairperson of the department             | Member                      |
| 3. External expert                           | Appointed by the university |

**A. The student will present a written report before the committee with following in view:**

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

- |                                          |                  |
|------------------------------------------|------------------|
| I. Academic Performance                  | -----            |
| II. Extra Curricular Activities          | <b>(8 Marks)</b> |
| III. Technical Activities                | <b>(8 Marks)</b> |
| IV. Industrial, Educational tour         | <b>(8 Marks)</b> |
| V. Sports/games                          | <b>(8 Marks)</b> |
| VI. Community Service, Hostel Activities | <b>(8 Marks)</b> |

**NOTE:** Report submitted by the students should be typed on both sides of the paper.

**B. A student will support his/her achievement and verbal & communicative skill through presentation before the examiners. (40 Marks)**

**C. Faculty Counselor Assignment (20 Marks)**

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelop to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

1. Discipline throughout the year
2. Sincerity towards study
3. How quickly the student assimilates professional value system etc.

**B.TECH. WEEKEND SEMESTER- VIII**  
**GPCSE (W)- 402: GENERAL FITNESS FOR THE PROFESSION**

L T P Credits  
 - - - 4

Class Work : --  
 Exam. : 100 Marks  
 Total : 100 Marks  
 Duration of Exam : --

At the end of each year students will be evaluated on the basis of their performance in various fields. The evaluation will be made by the panel of experts/examiners/teachers to be appointed by the Principal/Director of the College. A specimen perform indicating the weight age to each component/ activity is given below :-

Name : \_\_\_\_\_ College Roll No. \_\_\_\_\_  
 Univ.Roll No. \_\_\_\_\_  
 Branch \_\_\_\_\_ Year of Admission \_\_\_\_\_.

**I. Academic Performance (15 Marks) :**

(a) Performance in University Examination :-

| Sem. | Result | %age of Marks obtained | Number of Attempt in which the Sem. exam. has been cleared |
|------|--------|------------------------|------------------------------------------------------------|
| I    |        |                        |                                                            |
| II   |        |                        |                                                            |
| III  |        |                        |                                                            |
| IV   |        |                        |                                                            |
| V    |        |                        |                                                            |
| VI   |        |                        |                                                            |
| VII  |        |                        |                                                            |

**II. Extra Curricular Activities (10 Marks) :**

| Item                              | Level of Participation  | Remarks (Position Obtained) |
|-----------------------------------|-------------------------|-----------------------------|
| Indoor Games (Specify the Games)  | _____<br>_____<br>_____ | _____<br>_____              |
| Outdoor Games (Specify the Games) | _____<br>_____<br>_____ |                             |
| Essay Competition                 | _____<br>_____<br>_____ |                             |
| Scientific Technical Exhibitions  | _____<br>_____<br>_____ |                             |
| Debate                            | _____<br>_____<br>_____ |                             |

Drama \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Dance \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Music \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Fine Arts \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Painting \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Hobby Club \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

N.S.S. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Hostel Management \_\_\_\_\_  
 Activities \_\_\_\_\_  
 \_\_\_\_\_

Any other activity (Please Specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

III. Educational tours/visits/Membership of Professional Societies (5 Marks)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_  
 5. \_\_\_\_\_  
 6. \_\_\_\_\_

IV. Contribution in NSS Social Welfare Floor Relief/draught relief/Adult Literacy mission/Literacy Mission/Blood Donation/Any other Social Service (5 Marks)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_  
 5. \_\_\_\_\_  
 6. \_\_\_\_\_

V. Briefly evaluate your academic & other performance & achievements in the Institution (5 Marks)

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

VI. Performance in Viva voce before the committee (10 Marks)

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\*Marks obtained I.( )+II( )+III( )+IV( )+V( )+VI( ) =

\*\*Total Marks :

Member

Member

Member

Member

Member