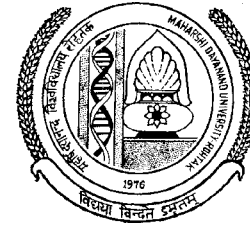# Maharshi Dayanand University
Rohtak

**Ordinance, Syllabus and Courses
of Reading for
B.Tech. (Computer Science Engg.)
(Semester III and IV)**

Session - 2009-2010

M.D.UNIVERSITY, ROHTAK
SCHEME OF STUDIES & EXAMINATIONS
Becholer of Engineering (Computer Science & Engg.)
SEMESTER-III (Scheme effective from) 2009-10

Course Notation	Course No.	Course Title	L	T	P	Total	Marks of class	Theory	Practical	Total Marks	Durati Exam.
1	MATH-201 E	Mathematics-III (Common for all Branches)	3	2	-	5	50	100	-	150	3
2	CSE-201 E	Data Structures & Algorithms (CSE, EI, IT, EI)	3	1	-	4	50	100	-	150	3
3	CSE-203 E	Discrete Structures (CSE, IT)	3	1	-	4	50	100	-	150	3
4	EE-217 E	Digital & Analog Communication (CSE, IT)	3	1	-	4	50	100	-	150	3
5	EE-204 E	Digital Electronics (CSE, IT) (Common with 4th sem.) (EE, EL, EI & IC)	3	1	-	4	50	100	-	150	3
6	HUM-201 E	Economics (Common for all branches)	3	1	-	4	50	100	-	150	3
7	IT-201 E	PC Lab (CSE,IT)	-	-	3	3	50	100	-	150	3
8	CSE-205 E	Data Structures & Algorithms Lab (CSE, IT)	-	-	3	3	50	100	-	150	3
9	EE-224 E	Digital Electronics Lab (CSE, IT & Common with 4th sem.- EE, EL, EI & IC)	1	0	3	4	50	-	100	150	4
		Total	**18**	**7**	**8**	**33**	**425**	**600**	**125**	**1150**	

Note :

1. **Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.**

2. **The practical hours for the subjects IT-201 E (PC Lab) and CSE-205 E (Data Structure & Algorithms Lab.) has been increased from 2 hours to 3 hours. The marks of class work as well as practical examination in these subjects have been increased from 25 each to 50 each. Thus the total marks for these subjecs shall be 100 in place of 50 from the session 2006-07.**

3. **The grand total of semester marks shall be 1150 in place of 1050 marks.**

M.D.UNIVERSITY, ROHTAK
SCHEME OF STUDIES & EXAMINATIONS
Becholer of Engineering (Computer Science & Engg.)
SEMESTER-V (Scheme effective from) 2009-10

Course Notation	Course No.	Course Title	L	T	P	Total	Marks of class	Theory	Practical	Total Marks	Durati Exam.
1	CSE-202 E	Data Base Management System (CSE,IT)	3	1	-	4	50	100	-	150	3
2	CSE-204 E	Programming Languages (CSE, IT)	3	1	-	4	50	100	-	150	3
3	CSE-206 E	Theory of Automata & Computation	3	1	-	4	50	100	-	150	3
4	IT-202 E	Object-Oriented Programming using C++ (CSE, IT)	3	1	-	4	50	100	-	150	3
5	CSE-208 E	Internet Fundamentals (CSE, IT)	3	1	-	4	50	100	-	150	3
6	CSE-210 E	Computer Architecture and Organization (CSE, IT and Common with 5th Sem. EL, EI, IC)	3	1	-	4	50	100	-	150	3
7	CSE-212 E	Data Base Management Systems Lab.	-	-	3	3	50	-	50	100	3
8	IT-206 E	C++ Progra- mming Lab. (CSE, IT)	-	-	2	2	25	-	25	50	3
9	CSE-214 E	Internet Lab. (CSE, IT)	-	-	2	2	25	-	25	50	3
10	GPCSE-202 E	General Proficiency	-	-	-	-	50	-	-	50	
		Total	**18**	**6**	**7**	**31**	**450**	**600**	**100**	**1150**	

Note :

1. **Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.**

2. **The practical hours for the subjects IT-201 E (PC Lab) and CSE-205 E (Data Structure & Algorithms Lab.) has been increased from 2 hours to 3 hours. The marks of class work as well as practical examination in these subjects have been increased from 25 each to 50 each. Thus the total marks for these subjecs shall be 100 in place of 50 from the session 2006-07.**

3. **The grand total of semester marks shall be 1150 in place of 1050 marks.**

MATHEMATICS-III
(COMMON FOR ALL BRANCHES)

MATH-201-E

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 consine 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, Trignometric and Hyperbolic functions, logrithmic 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. Zeroes and sigularities 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 onlu), 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 question taking atleast one from each part.

DATA STRUCTURES & ALGORITHMS
(CSE, EL, IT)

CSE-201-E	**Class work : 50 marks**
L T P	**Exam : 100 marks**
3 1 -	**Total : 150 marks**
	Duration of exam : 3 hrs.

Unit-I 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 Queuse/ Lists, Linked List implementation of Queues/ Lists, Circular implementation of Queues and Singly linked Lists, Straight/ circular implementation of double 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- 8 : 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 array & 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 :

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

Reference Books :

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.

- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983, AW

- Fundamentals of computer algorithms by Horowitz & Sahni and Rajasekaran.

- Data Structures and Program Design in C by Robert Kruse, PHI.

- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH

- Introduction to Computers Sciences - An Algorithms approach, Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.

- Data Structure and the Standard Template library- William 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. Stusents will ve required to attempt five questions in all.

DISCRETE STRUCTURES

CSE-203-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   -   **Total : 150 marks**

Duration of exam : 3 hrs.

Unit-I Set Theory: Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power 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 : Propostitional of Counting : Basic operations : AND(^), OR (v), NOT (-), Truth value of a compound statement, propositions, tautologies, contradictions.

Unit- 3 : Techniques of Counting : Permutation with and without repetition, Combinatoin.

Unit- 4: Recursion and Recurrence Relation : Polynomials and their ealuation, 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 : Algebra Structures : Definition and examples of a monoid, Semigrop, 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, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

Text Book :

• Elements of Discrete Mathematics C.L. lie, 1985, McGraw Hill.

Reference Books :

• Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001.

• Concrete Mathematics : A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.

• Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press

• Applied Discrete Structures for Computer Science, Doerr and Lebasseur, (Chicago : 1985, SRA

• Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London.

• Schaums Outline series : Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore.

• Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI.

• Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, McGraw Hill.

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

DIGITAL AND ANALOG COMMUNICATION

EE-217-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   -   **Total : 150 marks**

                                      Duration of exam : 3 hrs.

Unit-I 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; Types of services : connection oriented-, connectionless-services; Flow control : 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 multimplexing.

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 recundancy check; Data encryption : secret key cryptography, public key cryptograph; Data compression : run length encoding, Huffman encoding.

Text Book :

- Data Communications, Computer Networks and Open System Halsall Fred, (4th edition) 2000, Addison Wesley, Low Price edition.

Reference Books :

- Business Data Communications, Fitzgerald Jerry, 7th Ed. New York, 2001, JW & S,

- Communication Systems,4th Edi, by A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, 2002, TM

- Data Communications, Computer Networks and Open Systems, Halsall Fred, 1996, A.W.

- Digital Communications, J.G. Proakiss, 4th Ed. PHI

- Satellite Communication, Pratt, John Wiley

- Data & Computer Communications, W.Stallings PHI

- Digital & Data Communication system, Roden 1992, PHI

- Introduction to Digital & Data Communications, Miller Jaico Pub.

- Data Communications and Networking, Behrouz A. Forouzan, 2003, 2nd Edition, T.M.H

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

DIGITAL ELECTRONICS

EE-204-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   0   **Total : 150 marks**

                                    Duration of exam : 3 hrs.

Unit-I   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, Decorders, Address/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 :

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

Reference Books :

• Digital Integrated Electronics : Taub & Schilling; MGH

• Digital Principles and Applications : Malvino & Leach; McGraw Hill.

• Digital Design : Morris Mano; PHI

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

PC LAB.

IT-201-E	Class work : 50 marks
L T P	Exam : 100 marks
- - 3	Total : 150 marks
	Duration of exam : 3 hrs.

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 cable, connections and parts used in computer communication.

4. To study various cards used in a system vix display card, LAN card etc.

5. To remove, study and replace floppy dist 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 exercise related to various components of computer like monitor, drives, memory and printers etc.

Reference Books :

- Complete PC upgrade & maintenance guide, Mark, Mines, BPB Publ.

- PC Hardware : The complete reference, Craig Zacker & John Rouske, TMH

- Upgrading and Repairing PCs, Scott Mueller, 1999, PHI.

Note : At least 5 to 10 more exercises to be given by the teacher concerned.

DATA STRUCTURES AND ALGORITHMS LAB.

IT-201-E	Class work : 50 marks
L T P	Exam : 100 marks
- - 3	Total : 150 marks
	Duration of exam : 3 hrs.

1. Write a program to search and 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 for implementation of a file and performing 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 images 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 teacher concerned.

DIGITAL ELECTRONICS LAB

EE-224-E	Class work : 25 marks
L T P	Exam : 25 marks
0 0 2	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 fuction 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 operatiokn 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 a synchronous 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 K-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift-register and verify its operation. Verify the operation of a ring counter and a Johnson counter.

Note : At least 5 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.

DATA MANAGEMENT SYSTEMS

CSE-202-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   -   **Total : 150 marks**

Duration of exam : 3 hrs.

Unit- 1 : Introduction Overview of database Management Syste; 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 (Entiry 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 Language : QLB, QBE, Structured Query language- with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION - (upto 4th 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 :

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

- Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

Reference Books :

- Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.

- An Introduction to Database System by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.

- Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.

- Database Management Systems by A.K. Majumdar and P. Bhattacharya, 5th edition, 1999, Tata McGraw-Hill Publishing.

- A Guide to the SQL Standard, Date, C. and Darwen, H. 3rd edition, Reading, MA ; 1994, Addision-Wesley.

- 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. Stusents will ve required to attempt five questions in all.

PROGRAMMING LANGUAGES

CSE-204-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   -   **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 complier & 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, Stock 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, programmes and system controlled storage management & phases, Static storage manegement, Stack stored storage management, Heap oriented programming language, Comparison of C & C++ programmer languages.

Text Books :

- Programming languages Design & implementation bt T.W. Pratt, 1996, Prentice Pub.
- Programming Language- Principles and Paradigms by Allen Tucker & Robert   2002, TMH.

Reference Books :

- Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia   (Springer Veriag).
- Programming language concept by C. Ghezzi, 1989, Wiley Publications.
- Programming Languages - Principles and Pradigms Allen Tucker, Robert   .

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

THEORY OF AUTOMATA COMPUTATION

CSE-206-E   **Class work : 50 marks**

L   T   P   **Exam : 100 marks**

3   1   -   **Total : 150 marks**

                                  Duration of exam : 3 hrs.

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

Unit- 2 : Introduction to Machines: Concept of b asic Machine, Properties and limitations of FSM. Moore and mearly 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, Myphill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Unit- 4 : Grammers : 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 Flierarchies : Chomsky hierarchies of grammars, Unrestrictdd grammars, Contx : senstive languages, Relation between languages of classes.

Unit- 8 : Comutability : Basic concepts, Primitive Recursive Functions.

Text Books :

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

Reference Books :

*   Theory of Computer Sc. (Automata, Languages and computation) K.L.P. Mishra & .Chandrasekaran, 2000, PHI.
*   Introduction to formal Languages & Automata-Peter linz, 2001, Narosa Publ.
*   Fundamentals of the Theory of Computation-Principles and Prantice by RamondGreenlaw and H.James Hoover, 1998, Harcourt India Pvt. Ltd.
*   Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
*   Introduction to languges and the theory of Computation by John C. Martin 2003, TMH

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

OBJECT ORIENTED PROGRAMMING USING C++

CSE-202-E   **Class work : 50 marks**
L   T   P   **Exam : 100 marks**
3   1   -   **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, Hicrary files

Unit- 2 : Object Oriented Concepts : Introduction to Objects and Object Oriented Programming, Encapsulation (information Hiding), Access Modifies : 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 Fule, Reading Data Sequentially from a Random Access File. Stream Input/Output Classes and Objects, Stream Input, Unformatted I/O (with read and write), Stream Matripulators, 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 and Exception, Catching amd Exception, Rethrowing and Exception, Exception specifications, Procesing Unexpected Exceptions, Gtack Unwinding, Constructors, Destructors and

Exception handling, Exceptions and inheritance.

Text Books :

- C++ How to Program by HM Deitel and PJ Deitel, 1998, Prentice Hall.

- Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The WAITE Group Press

- Programming with C++ By D Ravichandran, 2003 T.M.H.

Reference Books :

- Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw Hill.

- Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley.

- 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. Stusents will ve required to attempt five questions in all.

INTERNET FUNDAMENTALS

CSE-202-E	**Class work : 50 marks**
L T P	**Exam : 100 marks**
3 1 -	**Total : 150 marks**
	Duration of exam : 3 hrs.

Unit- 1 : Electronic Mall : 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- 6 : 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 :

• Fundamentals of the Internet and the World Wide Web, Raymond Greenlew and Ellen Hepp-2001, TMH

• Internet & World Wide Programming, Deitel , Deitel & Nieto, 2000, Pearson, Education

Reference Books :

• Complete idiots guide to java script,. Aron Weiss, QUE, 1997

• Network firewalls, Kironjeet Syan - New Rider Pub.

• www.secinf.com

• www.hackers.com

• Alfred Glkossbrenner- Internet 101 Computing MGH, 1996

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

COMPUTER ARCHITECTURE & ORGANIZATION

CSE-210-E			**Class work : 50 marks**
L	**T**	**P**	**Exam : 100 marks**
3	**1**	**-**	**Total : 150 marks**
			Duration of exam : 3 hrs.

Unit- 1 : Basic Principles : Boolean algebra and Logic gates, Combinational logic blocks (Addres, Multiplexers, Encoders, decoder), 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 classifiction 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- 6 : Basic non pipelined CPU Architecture : CPU Architecture types (accumulator, registor, 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 perameters : 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 [80×86] : Instruction codes, computer register, compute : 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 :

• Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.

• Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

Reference Books :

• Operating Systems Internals and Design Principles by William Stallings, 4th edition, 2001, Prentice Hall Upper Saddle River, New Jersey.

• Computer Organization, 5th Edi, by Carl Hemacher, Zvonko Vranesic, 2002, Safwat Zaky.

• Structured Computer Organization by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.

• Computer Organization & Architecture : Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.

• Computer System Architecture by M. Mano, 2001, Prentice-Hall.

• 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. Stusents will ve required to attempt five questions in all.

COMPUTER ARCHITECTURE & ORGANIZATION

CSE-212-E	**Class work : 50 marks**
L T P	**Exam : 100 marks**
- - 3	**Total : 150 marks**
	Duration of exam : 3 hrs.

1. 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.
2. 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 and 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 teacher concerned.

C++ PROGRAMMING LAB.

IT-206-E	Class work : 25 marks
L T P	Exam : 25 marks
3 1 -	Total : 50 marks
	Duration of exam : 3 hrs.

Q.1   Raising a number n to a power p is the same as multiplying by itself p items. Weite a function called power ( ) that takes a double values for n and an int value for p, and returns the result as will be squared. Write a main ( ) function that gets values from the user to test this function.

Q.2   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 corrdinate 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. Than 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

Q.4   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 ins 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 result may be 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 centimeters 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 elimerating the highest.
- Overload >> operator to enable input through cin.
- Overload << operator to enable output through cout.

Write main ( ) to test all the functions in the class.

Q.7   Consider the following class definition

Class father {

     protected : int age;

pubic;

     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 out 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 demostrate 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.

Q.9   A hospital wants to create a database regarding its indoor patients. The information to store include

    a)   Name of the patient

    b)   Date of admission

    c)   Disease

    d)   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 String 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.

Q.11   Imagine a tollbooth with a class caleed 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 initialixes both these to 0. A member function called paying Car ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopay Car ( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the type 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 ca. Pushing the ESC kay shold cause the program to print out the total cars and total cash and then exit.

Q.12   Write a function called reversit ( ) that reservses a string (an array of char). Use a for loop that wirte a program to exercise

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

Q.12 Create some objects of the string class, and put them in a Deque-some at the head of the Decue and some at the tail. Display the contents of the Deque using the for Each ( ) function and a user written display function. Then search the Deque for a particlar string, using the first. That ( ) function display any strings that match. Finally remove all the items from the Deque using the get Left ( ) function and display each item. Notice the order in which the items are dislayed : 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 "fast in first out" order. The opposite would be true if gerRight ( ) 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 atrea of figures. Derives two specific classes triangle and rectagle from the base shape. Add to the base class, a member function get_data( ) to initialilze 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 $= \frac{1}{2} * x * y$

INTERNET LAB.

CSE-214-E | **Class work : 25 marks**
L   T   P | **Exam : 25 marks**
-   -   3 | **Total : 50 marks**
| **Duration of exam : 3 hrs.**

Exercise involving :

• Sending and receiving mails.

• Chatting on the net.

• Using FTP and Tel net server.

• Using HTML Tags (table, form, image, anchor etc.)

• Making a Web page of your college using HTML tags.

Note: At least 10 exercises to be given by the teacher concerned.