Details of courses for the department of Computer Science & Engineering

Semester1 and Semester2 are common for all Branches and is given separately

3rd Semester

S.N.	Subject Code	Course Name	Credits
THEORY			
1	EC3T03	Digital Electronics & Logic Design	3
2	CS3T01	Object Oriented Programming using C++	3
3	CS3T02	Graph Theory	3
4	CS3T03	Discrete Mathematics	3
5	CS3T04	Data Structures through C	3
6	CS3T05	System Analysis & Design Lab	3
PRACTICAL			
1	CS3L01	Object Oriented Programming using C++ Lab	1
2	CS3L02	Data Structures through C Lab	1
3	EC3L02	Digital Electronics & Logic Design Lab	1

4th Semester

S.N.	Subject Code	Course Name	Credits
THEORY			
1	CS4T01	Principle of programming Language	3
2	CS4T02	Theory of Automata	3
3	CS4T03	Computer Graphics	4
4	CS4T04	Computer Organization & Architecture	4
5	EC4T03	Microprocessor	4
6	CS4T05	Computer Based Numerical & Statistical Techniques	3
PRACTICAL			
1	CS4L01	Computer Graphics Lab	1
2	CS4L02	Computer Based Numerical & Statistical Techniques Lab	1
3	EC4L01	Microprocessor Lab	1

5th Semester

S. N.	Subject Code	Course Name	Credits
THEORY			
1	CS5T01	Web Technology	3
2	CS5T02	Operating System	4
3	CS5T03	Computer Networks	4
4	CS5T04	System Programming	3
5	CS5T05	Database Management Systems	4
6	CS5T06	Operation Research	3
PRACTICAL			
1	CS5L01	Web Technology Lab	1
2	CS5L02	Operating System Lab	1
3	CS5L03	Database Management Systems Lab	1

6th Semester

Sl. No.	Subject Code	Course Name	Credits
THEORY			
1	CS6T01	Algorithm Analysis & Design	3
2	CS6T02	Software engineering	3
3	CS6T03	Compiler Design	3
4	CS6T04	Distributed Systems	3
5	CS6T05	Advanced Computer Network	4
6	CS6T06	Principle of Economics & Accountancy	3
PRACTICAL			
1	CS6L01	Algorithm Analysis & Design Lab	1
2	CS6L02	Compiler Design Lab	1

7th Semester

Sl. No	Subject Code	Course Name	Credits
THEORY			
1	CS7T01	Advance Computer Architecture	4
2	CS7T02	Cryptography & Network Security	3
3	CS7T03	Industrial Organization & management	3
4		Elective-1	4
PRACTICAL			
1	CS7L01	.NET Programming Lab	1
2	CS7C01	Colloquium*	1
3	CS7PJ1	Project #	4

*****The student will give presentation (Colloquium) on the summer/winter/industrial training (4 – 6 weeks) that She / He underwent during the vacation period after 4th, 5th or 6th semester. The credit will be awarded in the 7th Semester under Colloquium.

#The student will submit a synopsis for their Project at the beginning of the semester in a specified format which should be approved by the departmental committee. The student will also have to present the progress of their project through seminars and progress reports.

8th Semester

Sl No	Course Code	Course Title	Credits
THEORY			
1	CS8T01	Artificial Intelligence	3
2	CS8T02	Software Testing	3
3		Elective-II	4
4		Elective-III	4
PRACTICAL			
1	CS8L01	Software Testing Lab	1
2	CS8L02	Artificial Intelligence Lab	1
3	CS8PJ1	Major Project*	8

*****The student will continue the project work carried over from the previous semester. The student will submit the final report/thesis of the project in the format specified by the School.

List of Elective Subjects

Sl. No	Subject code	Course Name	Credits
1	CSE01	Mobile Computing	4
2	ECE02	Digital Image Processing	4
3	CSE03	Embedded Systems	4
4	CSE04	E-Commerce & ERP	4
5	CSE05	Real Time System	4
6	CSE06	Linux Internal	4
7	CSE07	Multimedia Technologies	4
8	CSE08	Data Mining	4
9	CSE09	.NET & C# Programming Languages	4
10	CSE10	Distributed Database	4
11	CSE11	Wireless Network	4
12	CSE12	Fuzzy Logic and Neural Network	4

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
EC3T03	Digital Electronics & Logic Design	3	2	1	-

Unit I: Introduction To Digital System: Number systems, binary arithmetic and codes: positional number system; binary, octal and hexadecimal number systems; representation of signed numbers; binary arithmetic –addition, subtraction, multiplications and division; fixed and floating point numbers ; binary coded decimal codes; Gray codes; error detection and correction codes-parity check codes and Hamming code.

Unit II: Boolean Algebra And Switching Functions: Boolean algebra; basic postulates and fundamental theorems of Boolean algebra; truth tables; basic logic operations and gate symbols ; algebraic forms of switching functions- SOP and POS forms, minterms and maxterms; derivation of canonical forms; minterms and maxterms; simplification of switching functions- K-map and quine-McCluskey tabular minimization methods; synthesis of combinational logic circuits-NAND and NOR networks.

Unit III: Logic Families : Introduction to different logic families; operational characteristics of BJT in saturation and cut-off regions; operational characteristics of MOSFET as switch; TTL inverter- circuit description and operation; CMOS inverter-circuit description and operation; other TTL and CMOS gates; electrical behavior of logic circuits- noise margins, fanout, transmission time, propagation delay, power dissipation.

Unit IV: Combinational Logic Modules: Decoders, encoders, multiplexers, de-multiplexers and their applications; three state devices and buses; code converter; binary adders: half adder and full adder, ripple carry adder, carry-look-ahead adder; subtractors ; multipliers; ALU; comparators; parity circuits; circuit timing-timing diagrams and specifications ; combinational circuit design examples.

Unit V: Sequential Logic Devices And Circuits : Latches; flip- flops; registers, shift-registers; counters ripple counters , synchronous counters , up-down counters, BCD counters, ring counters, timing diagrams and specifications; state machine models-synchronous state machines; state machine design examples design examples; design using ASM charts ; timing hazards and races ; design and analysis of asynchronous sequential circuits: pulse mode and fundamental mode.

Unit VI: Programmable Logic Devices (PLDs): PROMs, PLAs, PAL, Semiconductor memory: organization, Operation, and classification.

Textbooks:

1. J.F. Wakerly, Digital Design-principles and practices , 3rd Ed, Pearson Education; 2001.
2. V.P.Nelson, H.T.Nagle, B.D. Carroll and J.D. Irwin, Digital Logic Circuit Analysis and Design, Prentice-Hall,1995.
3. R.F.Tinder, Engineering Digital Design, 2nd Ed. Harcourt India,2001.

References:

1. F.J. Hill and G.R. Peterson, Computer –aided Logical Design, 4th Ed. John W@iley,1993.
2. M.D. ERcegovac, T. Lang and J.H. Moreno, Introduction to Digital Systems, John Wiley,2000.
3. M.MAno, Digital Design, 2nd Ed. PHI,1997.
4. Z. Kohavi, Switching and Finite Automata Theory; TMH,2000.
5. P.K. Lala; Practical Design Logic design and Testing, Prentice-Hall,1996.
6. D.D. Gajski; Principles of Digital Design, Prentice Hall,1996.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS3T01	Object Oriented Programming using C++	3	2	1	-

UNIT-1: Introduction: Introducing Object-Oriented Approach related to other paradigms (functional, data decomposition), Characteristics of Object –Oriented Languages.

UNIT-II: Basic terms and ideas: Abstraction, Encapsulation, Information hiding, Inheritance, Polymorphism, Review of C, Difference between C and C++, cin, cout, new, delete operators.

UNIT-III: Classes and objects : Abstract data types, Objects & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, Copy Constructor, Static Class Data, Constant and Classes, C++ garbage collection, dynamic memory allocation.

UNIT-IV: Inheritance and Polymorphism : Inheritance, Types of Inheritance, Class hierarchy, derivation-public, private & protected, Aggregation, composition vs Classification hierarchies, polymorphism, Type of polymorphism- Compile time and runtime, Method polymorphism, polymorphism by parameter, Operator overloading, Parametric Polymorphism, Generic function – template function, function name overloading, Overriding inheritance methods.

UNIT-V: File and Exception Handling : Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes.

UNIT-VI: Standard Template Library: Standard Template Library, Overview of Standard Template Library, Containers, Algorithms, Iterators, Other STL Elements, The Container Classes, General Theory of Operation, vectors.

TEXT BOOKS :

1. A.R. Venugopal, Rajkumar, T. Ravishanker " Mastering C++", TMH, 1997.
2. R.Lafore," Object Oriented Programming with C++', BPB publication,2004.
3. Schildt Herbert,"C++ Programming", 2nd Edition, Wiley Dream Tech.

REFERENCE BOOKS :

1. D. Parasons, " Object Oriented Programming using C++", BPB Publications, 1999.
2. Steven C. Lawlor, " The art of Programming Computer Science with C++", Vikas publication, 2002.
3. Yashwant Kanetkar," Object Oriented Programming using C++", BPB, 2004.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS3T02	Graph Theory	3	2	1	

Unit I: Graphs, Sub graphs, some basic properties, various example of graphs & their sub

graphs, walks, path & circuits, connected graphs, disconnected graphs and component, euler graphs, various operation on graphs, Hamiltonian paths and circuits the traveling sales man problem.

Unit II: Trees and fundamental circuits, distance diameters, radius and pendent vertices, rooted and binary trees, on counting trees, spanning trees, fundamental circuits, finding all spanning trees of a graph and a weighted graph, algorithms of primes Kruskal and Dijkstra Algorithms.

Unit III: Cuts sets and cut vertices, some properties, all cut sets in a graph, fundamental circuits and cut sets , connectivity and separability, network flows Planer graphs, combinatorial and geometric dual: Kuratowski graphs, detection of planarity, geometric dual, Discussion on criterion of planarity, thickness and crossings.

Unit IV: Vector space of a graph and vectors, basis vector, cut set vector, circuit vector, circuit and cut set subspaces, Matrix representation of graph – Basic concepts; Incidence matrix, Circuit matrix, Path matrix, Cut-set matrix and Adjacency matrix. Coloring, covering and partitioning of a graph, chromatic number, chromatic partitioning, chromatic polynomials, matching, covering, four color problem

Unit V: Discussion of Graph theoretic algorithm wherever required.

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TEXT BOOKS :

1. Narsingh Deo, "Graph Theory: With Application to Engineering and Computer Science", Prentice Hall of India, 2003.
2. R.J. Wilson, "Introduction to Graph Theory", Fourth Edition, Pearson Education, 2003

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS3T03	Discrete Mathematics	3	2	1	-

Unit I: Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets. Relation : Definition ,types of relation, composition of relations, pictorial representation of relation, equivalence relation, partial ordering relation.
Function : Definition , types of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions.

Unit II: Theorem proving Techniques : mathematical induction (simple and strong), pigeonhole principle, prove by contradiction.

Unit III: Algebraic Structures : Definition, properties, types : Semi Groups, Monoid, Groups, Abelian group, properties of group, Subgroup, cyclic groups, Cosets, factor group, permutation groups, Normal subgroup, Homomorphism and isomorphism of groups, example and standard results, Rings and Fields : definition and standard results.
Posets, Hasse Diagram and Lattices : Introduction, ordered set, Hasse diagram of partiality, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded I and complemented lattices.

Unit IV: Boolean Algebra : Basic definitions, sum of products and product of sums, form in Boolean Algebra, Logic gates and Karnaugh maps.
Tree : Definition, Rooted tree, properties of trees, binary search tree, tree traversal.
Propositional Logic : Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

Unit V: Combinatorics & Graphs : Recurrence Relation, Generating function, Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs.

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TEXT BOOKS :

1. LIptschutz, Seymour," Discrete Mathematics ", Mc Graw Hill.
2. Tembley, J.P. & R. Manohar, " Discrete Mathematical Structure with Application to Computer Science",Mc Graw Hill.
3. Kenneth H. Rosen, " Discrete Mathematics and its applications", Mc Graw Hill.
4. Deo, Narsingh, " Graph Theory with application to Engineering and Computer Science," PHI.
5. Krishnamurthy, V., "Combinatorics Theory & Application," East-West press pvt. Ltd., New Delhi.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS3T04	Data Structures Through c	3	2	1	-

UNIT-I: Fundamentals of algorithm analysis: Big 'O' notations, Time and space complexity of algorithms, Elementary data structures and their applications.

UNIT-II: Arrays: ordered lists, representation of arrays, sparse matrices, linked lists : singly and doubly linked lists, stacks, queues, multiples stacks and queues, Applications : Polynomial arithmetic, infix, postfix and prefix arithmetic expression conversion and evaluations.

UNIT-III: Trees : Binary trees: Definition, traversal, threaded binary tree, Counting Binary Tree.

UNIT-IV: Graphs : Representation, traversal, connected components, shortest path and transitive closure, topological sort, activity network, critical path, path enumeration.Dijkstra's Algorithm, Floyd Warshall's Algorithm, Minimum Spanning Tree Definitions.

UNIT-V: Searching and Sorting : Binary Search Tree, Insertion & Deletion, AVL Trees, Hash function, Hash table, Internal sort: Radixsort, Insertion sort, Exchange sort, Selection Sort, Quicksort, Shellsort, Mergesort, Heapsort, External sort : K-way mergesort, balanced mergesort, polyphase mergesort.

UNIT-VI: Files: Files, Queries and sequential organization; Cylinder surface indexing, Hashed Indexed, Tree Indexing, B-Tress, Trie Indexing, Sequential file organizatio, random file organization, Hashed file organization, Inverted files, cellular partitions.

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TEXT BOOKS :

1. E. Horowitz and S. Sahani, " Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd. 1999.

2. R.L.Kruse, B.P. Leung, C.L. Tondo, " Data Strucfture and program design in C", PHI,2000.

Reference books :

1. Schaum's outline series, " Data Structure", TMH, 2002.

2. Y.Langsam et. Al., " Data Structures using C and C++", PHI,1999.

yashwant kanethkar, " Data Structure through C", BPB, 2005.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS3T05	System Analysis and Design	3	2	1	-

UNIT-I: System definition, Need for system development, Types of system, Types of user, System development strategies, SDLC, Structured Analysis Development Strategies, Physical and Logical DFD, Data Dictionary, System Prototype Method,

UNIT-II: Role of system analyst, System investigation :- Fact Finding Techniques, Tools for Documenting Procedures & Decision, Decision Tree, Decision Table, Structured English.

UNIT-III: Code design, Form design, Input design, Output design, Computer Aided system tools.

UNIT-IV: System Engineering and Quality Assurance, Design of software, Software design and documentation tools, Structured Flowchart, HIPO, Warnier /Orr Diagrams, Testing, Documentation, Managing System Implementation, Training, Conversion.

UNIT-V: Case Studies, Financial Accounting System, Payroll System, Library System, Inventory/Stock System, Billing System, (Input, Output, DFD)

Textbooks:

- Analysis & Design of Information System- James A. Senn.
- System Analysis & Design, 1st Edition,- S. Parthasarthy & B.W. Khalkar.
- Introduction to S.A.D. – LEE Vol. 1 & 2 .

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***

CS3L01	Object Oriented Programming using C++ Lab	1	-	-	2

1. To write a C++ program to calculate income tax using default arguments.
2. To write a C++ program to categorize employees based on designation using static data members.
3. To write a C++ program to add two private data members using friend functions.
4. To write a C++ program to implement matrix vector multiplication using friend functions.
5. To write a C++ program to manipulate complex numbers using operator overloading and type conversions.
6. To write a C++ program to perform matrix addition and subtraction using dynamic memory allocation.
7. To write a program to perform calculate student marks by overloading new and delete operators.
8. To write a program to develop a template for linked list class and its methods.
9. To write a program to implement bubble sort and insertion sort using templates.
10. To write a program to implement quick sort and merge sort using templates.
11. To write a program to implement quick sort and merge sort using templates.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS3L02	Data Structures through C Lab	1	-	-	2

1. Write C programs to implement the Stack ADT using an array, Queue ADT.
2. Write C programs to implement the Stack ADT and Queue ADT using a singly linkedlist
3. Write C program to implement the deque (double ended queue) ADT using a doubly

linked list.

4. Write a C program to perform the following operations:
   a. Insert an element into a binary search tree.
   b. Delete an element from a binary search tree.
   c. Search for a key element in a binary search tree.
5. Write a C program that use recursive functions to traverse the the given binary tree in
   a. Preorder
   b. Inorder.
   c. Postorder.
6. Write a C program that use non recursive functions to traverse the the given binary tree in
   a. Preorder
   b. Inorder
   c. Postorder.
7. Write C programs for the implementation of BFS & DFS for a given graph.
8. Merge sort & Heap Sort.
9. Insertion and deletion in B-Tree.
10. Write a C program to perform the following operations on AVL-trees:
    a. Insertion. b. Deletion.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
EC3L02	Digital Electronics & Logic Design Lab	1	-	1	2

1. Simplification, realization of Boolean expressions using logic gates/Universal gates.

2. Realization of Half/Full adder and Half/Full Subtractors using logic gates.

3. (i) Realization of parallel adder/Subtractors using 7483 chip
(ii) BCD to Excess-3 code conversion and vice versa.

4. Realization of Binary to Gray code conversion and vice versa

5. MUX/DEMUX – use of 74153, 74139 for arithmetic circuits and code converter.

6. Realization of One/Two bit comparator and study of 7485 magnitude comparator.

7. Use of a) Decoder chip to drive LED display and b) Priority encoder.

8.Truth table verification of Flip-Flops: (i) JK Master slave (ii) T type and (iii) D type.

8. Realization of 3 bit counters as a sequential circuit and MOD – N counter design (7476, 7490, 74192, 74193).
9. Shift left; Shift right, SIPO, SISO, PISO, PIPO operations using 74S95.

10. Wiring and testing Ring counter/Johnson counter.

12. Wiring and testing of Sequence generator.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS4T01	Principal of Programming Language	3	2	1	-

Unit I: Introduction Role of programming languages, need to study programming languages, characteristics of a good programming languages, Introduction to various programming paradigms: Procedural, objectoriented, logic and functional programming, Parallel Programming, Concurrent Programming Data Types: properties of structured and non-structured data types and Objects, variables, constants, Derived and abstract data types, declaration, type checking. Binding and binding times, type conversion, scalar data type, composite data types, Implementation and Storage representation of data types and control flow statement. Procedures: Procedure call and return, recursive subprogram, Different

parameter passing methods, Lifetime of variables, Scope rules: Static and Dynamic scope, Referencing environment: activation records (Local, Non local and Global), Storage management (static and Dynamic), Exceptions and exception handling

Unit II: Procedural Programming Design Principles, Control flow: statement-oriented and block-oriented structure programming, Execution steps, desirable and undesirable characteristics of procedural programming. Procedural Programming with Pascal: Program structure, Lexical elements, Data Types, Operators and punctuators, variable and type declarations, I/O, type conversion, control structures: conditional and iterative, arrays, procedures and functions, local and global variables, nested procedures and scope rules, pointers, parameter passing, User defined data types, comparative study of C and PASCAL

Unit III: Object Oriented Programming Design Principles:
Objects, classes, Messages and methods, Implementation of Object-oriented Programming, Object oriented programming with Java: Program structure, Object and class declarations, constructors, inheritance, polymorphism, access specification, interfaces, packages, exception handling, Java I/O, Java applications and applets, introduction to Java threads and multithreading, Socket Programming, JDBC, Comparative study of C++ and Java.

Unit IV: Introduction to .NET Technology and C#: Brief introduction to Microsoft .NET - The Microsoft .NET platform, .NET framework, advantages, introduction to C#, type system, classes, method, Properties, Arrays, Interfaces, Delegates and event handlers, Assemblies and Modules, late binding, creating and executing code at Run Time, Multithreading Patterns, Exception Handling.

Unit V: Logic Programming Logic programming language model, logical statements, resolution, unification, search structures: backward and forward, Applications of logic programming Logic Programming with Prolog: Program structure, logical variable, syntax structure, Control structure, resolution and unification, depth-first search, backtracking, cut operator, recursive rules, Prolog facilities and deficiencies

Unit VI: Functional Programming
Introduction to functional programming, Lambda calculus: Ambiguity, free and bound identifiers, reductions, typed lambda calculus, application of functional programming Functional Programming with LISP: Elements of functional Programming, Function declaration, Expression evaluation, type checking

Textbooks:

1. Roosta S., "Foundations of Programming Languages", Thomson Brookes/Cole, ISBN 981 -243- 141-2. Sethi R., "Programming Languages concepts & constructs", 2nd Edition, Pearson Education, ISBN 81 - 7808 - 104 – 0

References Books:

1. Scbesta R., "Concepts Of Programming Languages", 4th Edition, Pearson Education, ISBN-81- 7808-161-X
2. Balagurusamy E., "Programing with C#", Tata McGraw-Hill, 2002, ISBN 0 - 07 -047339-0
3. K.Venugopal., "Programming in Turbo PASCAL", Tata-McGraw Hill,
4. Herbert Schildt "The Complete Reference Java2", 5th Edition, Tata McGraw-Hill 0 - 07- 049543-2 5. Winston P., Klaus B., Horn P., "LISP", 3rd Edition, Pearson Education, 81 - 7808 -155-5 6. Carl Townsend ,"Programming in turbo PROLOG", Tata-McGraw Hill

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS4T02	Theory of Automata	3	2	1	-

UNIT-1: Introduction: Deterministic and non deterministic finite automata, regular expression, two way finite automata, finite automata with output, properties of regular sets, pumping Lema closure properties, My Hill Nerode Theorem.

UNIT-II: Context free Grammars : Derivation tree simplification form. Push down Automata :

definition, relationships between PDA and context free languages, properties of CFLS, decision algorithm.

UNIT-III: Turing machines: Turing machines models, complete languages and functions, modification of Turing machines, church's machine Undecidability.
Properties of recursive and recursively enumerable languages, universal Turing machines,Post correspondence problem, introduction to recursive function theory.

UNIT-IV: Chomosky Hierarchy : Regular Grammars, Unrestricted grammars, context sensitive languages, relation between classes of languages.

Textbooks:

1. Hopcroft and Ullman, " Introduction to Automata Theory Languages and Computation ", Addision Wesley.
2. Mishra & Chandrashekhran, " Theory of Computers Sciences ", PHI.
3. E.V. Krishnamurthy, " Theory of Computer Sciences", East west publication.
4. Kohan, " Theory of Computer Sciences ".
5. Korral, " Theory of Computer Sciences".
6. Zvi Kohavi, " Switching & Finite Automata Theory ", TMH.
7. Martin, " Introduction to Languages and Theory of computation ", TMH.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS4T03	Computer Graphics	4	3	1	-

UNIT I: Survey of computer graphics: computer-aided design, presentation graphics, computer art, entertainment, education and training, visualization, image processing, graphics user interface, overview of graphics system: refresh cathode ray tubes, raster scan displays, random scan displays, color CRT monitors, flat panel displays, input devices.

UNIT II: Line Drawing Algorithm: DDA algorithm, Bresenham's line Algorithm, Circle Generating Algorithm: Circle-Generating Algorithm, properties of Circles, Midpoint Circle Drawing Algorithm, other curves, conic sections,

polynomials and spline curves, Filled- Area primitives: Scan-Line Polygon Fill algorithm, Inside-outside tests, boundary-fill Algorithm, Fill Area functions.

UNIT III: Basic Transformation: translation, rotation, scaling, matrix representation and homogeneous coordinates, composite transformations: translations, rotation, scaling, : Homogeneous co-ordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D),Computing location of V.P, reflection and shear.

UNIT IV: Viewing pipeline, viewing coordinate reference frame, window-to-viewport coordinate transformation, two dimensional viewing functions, clipping operations, point clipping, line clipping: Sutherland-Cohen line Clipping Algorithm, polygon Clipping: Sutherland and Hodgeman polygon clipping.

UNIT V: Curves and surfaces: Bezier curves using Berstein polynomials, condit5ions for smoothly joining curve segments, Bezier bi-cubic surface patch, B-Spline curves uniform knot vectors, Testing for first and second order continuities, sweep representations, constructive solid-geometry methods, octrees.

UNIT VI: Projection and Solid Modelling: Parallel Projection, Oblique Projection on XY plane, Isometric Projection, Perspective Projection, One vanishing Point (V.P) projection from a point on z axis, Generation of 2 V.P. Projection, Isometric projection, projection, one vanishing point (V.P), projection from 0 point on z axis, Generation of 2 VP projector & projections, Solid Modelling.

UNIT VII: Shading and Hidden Surface Removal : Shading, Illumination Model for diffused Reflection, Effect of ambient lighting, distances, Specular Reflection Model, Computing reflection vector, Curve surfaces, polygonal Approximation, Gourard Shading, Phong Model, Hidden Surface Removal, Back Face Detection,Depth Buffer (Z-Buffer, A-Buffer) Method, Scan Line Method, Depth Sorting Method, Area subdivision Method.

TEXT BOOKS :

1. Folry et.al., " Computer Graphics Principles & Practice", Addison Wesley, 1999.
2. David F. Rogers, " Procedural Elements for Computer Graphics", McGraw Hill Book Company,1985.

REFERENCE BOOKS :

1. D.Rogers and J. Adams, " Mathematical Elements for Computer Graphics", MacGraw Hill International Edition, 1989.
2. D. Hearn and P. Baker, " Computer Graphics", Prentice Hall, 1986.
3. R. Plastock and G. Kalley, " Theory and problems of Computer Graphics ", Schaum's Series, McGraw Hill, 1986.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS4T04	Computer Organization & Architecture	4	3	1	-

Unit-I: Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Microoperation, Arithmetic Logic Shift Unit, Design of Fast address, Arithmetic Algorithms (addition, subtraction, Booth Multiplication), IEEE standard for floating point numbers.

Unit-II: Control Design : Hardwired & Micro programmed (Control Unit) : Fundamental Concepts (Register Transfers, performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple –Bus organization, Hardwired Control, Micro programmed control (Microinstruction, Micro-program sequencing, Wide-Branch addressing, Microinstruction with Next-address field, pre-fetching Microinstruction).

Unit-III: Processor Design : Processor organization : General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, program control, Reduced Instruction Set Computer.

Unit-1V Input-output Organization: I/O Interface, modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-output processor, Serial Communication.

Unit V Memory Organization : Memory Hierarchy, Main Memory (RAM and ROM Chips), organization of 2D and $2^{1/2}$D, Auxiliary memory, Cache memory , Virtual Memory, Memory management hardware.

Text book :

1.Computer System Architecture, M. Mano(PHI).

Reference Book :

1.Computer Organization, Vravice, Zaky & Hamacher (TMH publication).
2.Structured Computer Organization, Tannenbaum(PHI).
3.Computer Organization, Stallings(PHI).
4.Computer Organization, John P. Hayes (MC Graw Hill).

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
EC4T03	Microprocessor	4	3	1	-

Unit I: Introduction to Microprocessors
Evolution microprocessor, register structure, ALU, BUS Organization, timing and Control.

Unit II: Architecture of a 8-blt Microprocessors
Organization of 8085 Bus Interface sequential Memory Organization, Bus Unit, Execution Unit, Register Organization, Cycle.

Unit III: Assembly Language Programming
Addressing Modes, Data Transfer Instructions, Arithmetic and Logic Instructions, Program control Instructions

(Jumps, Conditional Jumps, Subroutine Call) loop and string instructions, Assembler Directives, Parameter Passing and Recursive Procedures.

Unit IV: CPU Module Design Signal Description of 8085, Clock Generation, Address and Data bus Demultiplexing, Buffering, memory Organization, Read and Write Cycle Timings, Interrupt Structures.

Unit V: Basic I/O Interfacing Programmed I/O, Interrupt liven I/O, .DMA, Parallel I/O -8255, Serial I/O (8 5118250, RS-232 Standard), 8259-Programmable Interrupt Controller, 8237-DMA controller, 8253/8254-Programmable Timer/Counter, AID and D/ A Conversion.

Unit VI: Memory Interfacing Types of Memory, RAM and ROM Interfacing with Timing Considerations, DRAM Interlacing, Trouble Shooting of Memory Module. Advanced Microprocessors and Microcontrollers.

Text book :

1. Microprocessor Architecture and interfacing: Ramesh S.Gaonkar
2. Microprocessor: A.P.Mathur.

References:

1. Microprocessors & Interfacing – Douglas U. Hall, 2007.
2. Microprocessors and Microcontrollers Kumar, Senthil, Saravanan, Jeevananthan Oxford University, New Delhi, latest edition.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS4T05	Computer Based Numerical & Statistical Techniques	3	2	1	-

Unit I: Introduction: Numbers and their accuracy, Computer Arithmetic, Mathematical preliminaries, errors and their computation, General error formula, Error in series approximation.

Unit II: Solution of Algebraic and Transcendental Equation:
Bisection Method, Iteration method, Method of false position, Newton-Raphson method, Methods of finding complex roots, Muller's method, Rate of convergence of Iterative methods, polynomial Equations.

Unit III: Interpolation: Finite Differences, Difference Tables

Polynomial Interpolation: Newton's forward and backward formula.
Cental Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula.
Interpolation with unequal intervals: Langrange's Interpolation, Newton Divided difference formula, Hermite's Interpolation.

Unit IV: Numerical Integration and Differentiation: Introduction, Numerical differentiation Numerical Integration: Trapezoidal rule, Simpson's 1/3 and 3/8 rule, Boole's rule, Waddle's rule.

Unit V: Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta Methods, Predictor Corrector Methods, Automatic Error Monitoring and Stability of solution.

Unit VI: Statistical Computation : Frequency chart, Curve fitting by method by least squares fitting of straight lines, polynomials, exponential curves etc, Data fitting with Cubic splines, Regression Analysis, Linear and Non linear Regression, Multiple regression, statistical Quality Control methods.

REFERENCES:

1. Rajaraman V, " Computer Oriented Numerical Methods", Pearson Education.
2. Gerald & Whealey, " Applied Numerical Analyses ", AW.
3. Jain, Iyengar and Jain," Numerical Methods for Scientific and engineering Computations", New Age Int.
4. Grewal B.S, " Numerical methods in Engineering and science", Khanna publishers, Delhi.
5. T. Veerarajan, T. Ramachandran," Theory and Problems in Numerical Methods, TMH.
6. Pradip Niyogi," Numerical Analysis and Algorithms," TMH.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS4L01	Computer Graphics Lab	1	-	-	2

1. Write a program to plot a pixel with red color at (50,40).
2. Write a program to draw a line from (50, 40) to (110,160) using built in C function.
3. Write a program to draw a circle at center (30, 30) with radius 30 using built in C function.
4. Write a program to draw a rectangle at (30, 50, 50, 20) using built in C function.
5. Write a program to draw a line using DDA algorithm.

6. Write a program to draw a line using Bresenham's line algorithm.
7. Write a program to draw a circle using mid-point circle algorithm.
8. Write a program to draw the polygon of n-sides using translation.
9. Write a program to draw polygon using scaling method.
10. Write a program to draw a Bezier curve.
11. Write a program to draw a polygon of 6 sides and scale the polygon .
12. Write a program to implement the Boundary fill algorithm.
13. Write a program to implement the scan fill algorithm.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS4L02	Computer based Numerical & Statistical Techniques Lab	1	-	-	2

1) Write C program for Mathematical preliminaries, errors and their computation, General error formula, Error in series approximation.
2) Write C program for Bisection Method, Iteration method, Method of false position.
3) Write C program for Newton-Raphson method
4) Write C program for Muller's method
5) Write C program for Rate of convergence of Iterative methods, polynomial Equations.
6) Write C program for Finite Differences, Difference Tables.
7) Write C program for Newton's forward and backward formula.

8) Write C program for Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula.
9) Write C program for Langrange's Interpolation, Newton Divided difference formula, Hermite's Interpolation.
10) Write C program for Trapezoidal rule, Simpson's 1/3 and 3/8 rule, Boole's rule, Waddle's rule.
11) Write C program for Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta Methods, Predictor Corrector Methods, Automatic Error Monitoring and Stability of solution.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
EC4L01	Microprocessor Lab	1	-	-	2

1) Data transfer instructions like:
   i] Byte and word data transfer in different addressing modes.
   ii] Block move (with and without overlap)
   iii] Block interchange
2) Arithmetic & logical operations like:
   i] Addition and Subtraction of multi precision nos.
   ii] ASCII adjustment instructions
   iii] Code conversions
   iv] Logical operations
3) Bit manipulation instructions like checking:
   i] Whether given data is positive or negative

ii] Whether given data is odd or even
iii] Logical 1's and 0's in a given data
iv] 2 out 5 code
v] Bit wise and nibble wise palindrome

4) Branch/Loop instructions like:
Arrays: addition/subtraction of N nos.
Finding largest and smallest nos.
Ascending and descending order

5) Programs on String manipulation like string transfer, string reversing, searching for a string, etc.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS5T01	Web Technology	3	2	1	-

UNIT I: Introduction to java: Importance and features of java, keywords, constants, variables and data types, operators and expressions, decision making, branching and looping : if..else, switch,?: operator, while, do, for statements, labeled loops, jump statements: break, cotnue return. Introducing classes, objects and methods: defining a class, adding variables and methods, creating objects, constructors, class inheritance.

UNIT II: Arrays and String: Creating an array, one and two dimensional array, string array and methods,Classes: String and String Buffer Classes, Wrapper classes: Basic types, using super, Multilevel hierarchy abstract and final classes, object class, packages and interfaces, Access protection, Extending Interfaces, packages.

UNIT III: Exception Handling: Fundamentals exception types, uncaught exceptions, throw, throw final, built in exception, creating your own exceptions, Multithreaded programming: Fundamentals, java thread model: priorities,

synchronization, messaging, thread classes, Run able interface, inter thread communication, suspending, resuming and stopping threads. Input/Output programming: Basics, Streams Byte and character stream, predefined streams, Reading and Writing from console and files. Using Standard Java packages (lang,util,io,net). Networking: Basics, networking classes and interfaces,using java.net package, doing TCP/IP and Data-gram programming.

UNIT IV: Event Handling: Different Mechanism, the Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter and Inner Classes, Working with windows, Graphics and Text, using AWT controls, Layout managers and menus, handling Image,animation, sound and video,java Applet. Beans: Introduction to Java and swings, Servlets.

UNIT V: Website Designing: Overview of Internet and Intranet Services, sending and Receiving Mails, HTML Tags, Creating Tables, Check Boxes, Text Books, Frames, Graphical and animation techniques, Static & Dynamic Web pages, Guidelines for a good website design, DHTML, ASP, javascript.

TEXT BOOKS

1. Patrick Naughton and Herbertz schildt, " Java-2 The Complete Reference", 1999, TMH.
2. Rick Dranell, " HTML 4 unleashed", Techmedia", publication,2004.
3. Shelley Powers, " Dynamic Web publishing", 2nd Ed., Techmedia,1998.

REFERENCE BOOKS:

1. E. Balaqguruswamy, " Programming with Java: A Primer", TMH,1998.
2. Horstmann, " Computing Concepts with Java 2 Essentials", John wiley,2004.
3. Decker & Hirshfield, " Programming java: A introduction to programming using JAVA", Vikas publication,2000
4. Tmy Gaddies, " Starting out with Java", Wiley Dreamtech,2005.
5. Holzner, " HTML Blackbook", Wiley Dreamtech,2005.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS5T02	Operating System	4	3	1	-

UNIT I: Introduction, What is an operating System, Simple Batch Systems, Multi Programmed Batches Systems, Time-Sharing Systems, Personal-Computer systems, Parallel Systems, Distributed Systems, Real-Time Systems.

UNIT II: Memory Management : Background, Logical versus physical address space ,swapping , contiguous allocation, paging, Segmentation, Segmentation with paging. Virtual Memory : Demand paging, Page Replacement, Page-replacement Algorithms, performance of demand paging, Allocation of Frames, Thrashing, Other Considerations, Demand Segmentatio9n.

UNIT III: Secondary-Storage Structure : Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability.
Processes : Process Concept, process Scheduling, Operation on processes, co-operating processes, Inter

process Communication.

UNIT IV: CPU Scheduling : Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation.
Process Synchronization : Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Synchronization in Solaris 2, Atomic Transactions.

UNIT V: Deadlocks : System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined Approach to Deadlock Handling.
Device Management : Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Device characteristics-Hardware Consideration, Input or Output Devices, Storage Devices, Channels and Control Units, Independent Device Operation, Buffering, Multiple paths, Block Multiplexing, Device Allocation Consideration.

UNIT VI: Information Management : Introduction, A Simple File System, General Model of a file System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System File-System Interface: File Concept, Access Methods, Directory Structure, Protection , Consistency Semantics File Systems Implementation: File-System Structure, Allocation Methods, Free-Space Management, Directory Implementation, Efficiency and performance, Recovery.

Textbooks:

1. Silbersachatz and Galvin, " Operating System Concepts ", Pearson, 5th Ed., 2001.
2. Dr.RC.Joshio, " Operating Systems ", Wiley Dreamtech, 2005.

REFERENCES BOOKS

1. Tannenbaum, ' Operating Systems", PHI, 4th Edition,2009.
2. E.Madnick,J. Donovan,"Operating Systems", Tata McGraw Hill,2001.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS5T03	Computer Networks	4	3	1	-

Unit I: Introduction to computer network and internet What is internet? Network edge, Network core, Protocol layers and services model, Network standardization. Uses of computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IP-Overview, IP Address Classes, Subneting), Domian Name Registration & Registrars

Unit II: The Data Link Layer: Data Link Layer design issues, error detection and correction, data link protocols, sliding window protocolsStop-and-Wait protocol, Sliding Window protocol, HDLC, Data link layer in Internet and ATM Medium access control sublayer: Channel allocation: Static and Dynamic allocation, Multiple Access Protocols: ALOHA, CSMA, Collision-free and limited-contention protocols, Virtual LANs, , Examples of Data Link Protocols,

Unit III: Quality of service and Traffic Management Introduction to quality of services, scheduling, congestion control, differentiated services, integrated services, RSVP

Unit IV: Theoritical basis for data communication, transmission media – Magnetic Media,Twisted pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling , Cable Mounting,

Cable Testing, Wireless transmission, the telephone system, narrowband ISDN and ATM.

Unit V: Lower level protocols and implementation HDLC, PPP protocols, internetworking devices like hubs, switches, routers, bridges. Link virtualization (ATM, MPLS),ATM Network

TEXT BOOKS:

1. A.S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.

REFERENCE BOOKS:

1 U.Black,"Computer Networks-Protocols, Standards and interfaces", PHI.
2. W.Stallings, "Computer Communications Networks", PHI,1999.
3. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.
4. Michael A. Miller," Data & Network Communication", Vikas Publication, 1989.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS5T04	System Programming	3	2	1	-

Unit I: Introduction to Systems Programming Introduction:

Components of System Software, Language Processing Activities, Fundamentals of Language Processing. Assemblers: Elements of Assembly language programming. Simple assembler scheme, Structure of an assembler, Design of single and two pass assembler

Macro Processors: Macro Definition and call, Macro expansion, Nested Macro Calls, Advanced Macro Facilities, Design of a two-pass and nested macro-processor

Unit II: Loaders and Linkers Loaders:

Loader Schemes: Compile and go, General Loader Scheme, Absolute loaders, subroutine linkages, relocating loaders, direct linking loaders, overlay structure, Design of an absolute loader, design of direct linking loader. Linkers: Relocation and linking concepts, Design of linker, self relocating programs, Static and dynamic link libraries, use of call back functions, Dynamic linking with and without import

Unit III: Editors: Introduction to Software Tools, Text editors, Interpreters, Program Generators, Debug Monitors. Line editor, full screen editor and multi window editor, Case study MS-Word, DOS Editor and vi editor

Unit IVDebuggers: Description of various debugging techniques.

Text books:

1. Stalling William, "Operating Systems" , Pearson Education, fifth edition.
2. John J. Donovan," Systems programming" ,TMGH

References Books:

1. Beck L., "System Software: An Introduction to Systems Programming", 3rd Edition Pearson Education
2. Milan Melankovic "Operating systems"., Second edition ,TMGH. 3. Silberschatz A., Galvin P., Gagne G., "Operating System Concepts ", John Wiley and Sons, 8th Edition.
4. Petzold C., "Programming Windows", 5th Edition, Microsoft Press, 81-7853- 007-4
5. Dhamdhere D.M., "Systems Programming and Operating Systems", 2nd revised Edition, TMGH
6. Adam Hoover, "System Programming with C and UNIX", Pearson Education Sibsankar Haldar, Alex A Arvind, "Operating Systems", Pearson Education

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS5T05	Database Management Systems	4	3	1	-

UNIT I: Basic concepts and conceptual database design : Database administrator & Database users, characteristics of the database, Database systems, concepts and architecture, Data models, schemes & instances, DBMS architecture & Data independence, Database languages & interfaces, overview of hierarchical, network & relational Database management systems, Data modeling using the entity-relationship model- entities, attributes and relationships, cardinality of relationships, strong and weak entity sets, generalization, specialization, and aggregation, translating your ER model into relational model.

UNIT II: Relational model, languages & systems : Relational Data model & relational algebra, relational model concepts, relational model constraints, relational algebra, SQL- A relational Database language, Data definition in SQL, view and queries in SQL, specifying constraints and indexes in SQL, practicing SQL commands using ORACLE.

UNIT III: Relational database design and oracle architecture : functional dependences & normalization for relational database, functional dependences, normal form s based on primary keys, (1NF, 2NF, 3NF & BCNF), lossless join and dependency preserving decomposition, oracle 8 architecture, database storage, oracle software structures, Shared database access mechanism, database protection.

UNIT IV: Transaction management : Transaction concept and state, implementation of atomicity and durability, concurrent executions, serializability, recoverability, implementation of isolation, concurrency control techniques, lock-based protocols, timestamp-based protocols, deadlock handling recovery system, failure classification, storage structure, recovery and atomicity, log- based recovery, shadow paging , recovery with concurrent transactions, buffer management, indexing, hashing and query processing: query processing overview, measures of query cost, selection operation, sorting, join operation, other operations, evaluation of expressions, concepts of object oriented database management systems, distributed data base management systems.
.

TEXT BOOKS :

1. Korth, Silberschatz, " Database system concepts ", 4th Ed., TMH, 2003.
2. Steve Bobrowski, " Oracle 8 architecture", TMH,2000.

REFERENCES BOOKS :

1. C.J.Date, " An introduction to database systems", 7th Ed., Narosa publishing, 2004.
2. Elmasri and Navathe, " Fundamentals of database systems ", 4th Ed., A. Wesley, 2004.
3. J.D. Ullman, " Principles of database systems", 2nd Ed., Galgotia publications, 1999.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS5T06	**Operation Research**	3	2	1	-

UNIT I: Introduction : Optimization, Classification of beginning and progress of O.R, Mathematical modeling in O.R.Optimization Problems The Linear Programming: Introduction, Formulation of L.P. models graphical solution for L.P.P., Simplex method,Duality in LPP, Importance of dual, Dual simplex method,
Sensitivity Analysis in LP, Introduction to Special LP Models

UNIT II: Transportation Model/ Problems: Initial solution byNWCM, VA.M. Optimization of the solution, degeneracy in transportation problem, alternate solutions Assignment Model/ Problems : Hungarian Method and relevant problems

UNIT III: Integer Programming: Branch and Bound technique, Gomory's cutting plane method.

Dynamic Programming: Introduction Investment problem, Stagecoach problem, Equipment replacement problems.

UNIT IV: Decision Theory: Introduction, Minimax decision procedure, Bayes decision procedure with / without data, Regret function Vs loss function. Game Theory: Introduction, Minimax, Maximin procedure, Pure strategy, Mixed strategy, Expected pay off, Solution of 2 X 2 games, Dominance rules.

UNIT V: Queuing Theory: Introduction, Characteristics of queuing systems, Queuing models with Poisson input, Exponential service infinite population / finite population model, Multi channel finite / infinite population model, Queuing problems for formulated as a Markov chain.

TEXT BOOKS

1. Introductionto O.R., Billey E. Gillet, Tata MC Hill
2. Optimising Theory and Applications, S.S. Rao
3. Operations Research, Kanti Swarup
4. Optimisation Techniques, Phillips and Ravindran
5. Operations Research, W. Taha .
6. Operations Research- J K Sharma

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS5L01	Web Technology Lab	1	-	-	2

1. Write a simple java program to print a message.
2. Write a java program to count the number of even and odd numbers in an array.
3. Write a java program to count the number of even and odd numbers in an array.
4. Write a java program to find the volume of solids.
5. Write a java program to overload the Method Area().
6. Write a java program to Overload the constructor box().
7. Write a java program for correct implementation of Producer and Consumer
8. Write a java program to compute the square root.
9. Write a java program to compute the area of a room using multiple classes.
10. Write a java program to compute the area of a rectangle.
11. Write a java program that implements inheritance.
12. Write a java program that implements the use of package.
13. Write a java program to generate the multiplication table.
14. Write a java program to display a Simple Banner Applet.
15. Write an applet program to animate moving car.
16. Write an applet program to design a digital clock.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS5L02	Operating System Lab	1	-	-	2

1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir.
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write C programs to simulate UNIX commands like ls, grep, etc.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
6. Developing Application using Inter Process communication (using shared memory, pipes or message queues)
7. Implement the Producer – Consumer problem using semaphores (using UNIX system calls).
8. Implement some memory management schemes – I
9. Implement some memory management schemes – II
10. Implement any file allocation technique (Linked, Indexed or Contiguous)
11. Write a C/C++ script to display all logged in users
12. C++ program to identify the available memory in the system.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS5LO3	**Database Management Systems Lab**	1	-	-	2

1.Consider the insurance database given below. The primary keys are made bold and the data types are specified.
PERSON(driver_id:string , name:string , address:string)
CAR(regno:string , model:string , year:int)
ACCIDENT(report_number:int , accd_date:date , location:string)
OWNS(driver_id:string , regno:string)
PARTICIPATED(driver_id:string , regno:string , report_number:int , damage_amount:int)
1)Create the above tables by properly specifying the primary keys and foreign keys.
2)Enter at least five tuples for each relation.
3)Demonstrate how you
a.Update the damage amount for the car with specific regno in the accident with report number 12 to 25000.
b.Add a new accident to the database.
4)Find the total number of people who owned cars that were involved in accidents in the year 2008.
5)Find the number of accidents in which cars belonging to a specific model were involved.

2.Consider the following relations for a order processing database application in a company.
CUSTOMER(custno:int , cname:string , city:string)
ORDER(orderno:int , odate:date , custno:int , ord_amt:int)
ORDER_ITEM(orderno:int , itemno:int , quantity:int)
ITEM(itemno:int , unitprice:int)
SHIPMENT(orderno:int , warehouseno:int , ship_date:date)
WAREHOUSE(warehouseno:int , city:string)
1)Create the above tables by properly specifying the primary keys and foreign keys.
2)Enter at least five tuples for each relation.
3)Produce a listing: custname , No_of_orders , Avg_order_amount , where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.
4)List the orderno for orders that were shipped from all the warehouses that the company has in a specific city.
5)Demonstrate the deletion of an item from the ITEM table and demonstrate a method of handling the rows in the ORDER_ITEM table that contains this particular item.

3.Consider the following database of student enrollment in courses and books adopted for that course.
STUDENT(regno:string , name:string , major:string , bdate:date)
COURSE(courseno:int , cname:string , dept:string)
ENROLL(regno:string , courseno:int , sem:int , marks:int)
BOOK_ADOPTION(courseno:int , sem:int , book_isbn:int)
TEXT(book_isbn:int , book_title:string , publisher:string , author:string)
1)Create the above tables by properly specifying the primary keys and foreign keys.
2)Enter atleast five tuples for each relation.
3)Demonstrate how you add a new text book to the database and make this book to be adopted by some department.
4)Produce a list of text books (includes courseno , book_isbn , book_title) in the alphabetical order for courses offered by the 'CS' department that use more than two books.

5)List any department that has all its books published by a specific publisher.

4. The following are maintained by abook dealer.
AUTHOR(author_id:int , name:string , city:string , country:string)
PUBLISHER(publisher_id:int , name:string , city:string , country:string)
CATALOG(book_id:int , title:string , author_id:int , publisher_id:int , category_id:int , year:int , price:int)
CATEGORY(category_id:int , description:string)
ORDER_DETAILS(order_no:int , book_id:int , quantity:int)
1)Create the above tables by properly specifying the primary keys and foreign keys.
2)Enter at least five tuples for each relation.
3)Give the details of the authors who have 2 or more books in the catalog and the price of the books is greater than the average price of the books in the catalog and the year of publication is after 2000.
4)Find the author of the book that has maximum sales.
5)Demonstrate how you increase the price of books published by a specific publisher by 10%.

5.Consider the following database for a banking enterprise.
BRANCH(branch_name:string , branch_city:string , assets:real)
ACCOUNT(accno:int , branch_name:string , balance:real)
DEPOSITOR(customer_name:string , accno:int)
CUSTOMER(customer_name:string , customer_street:string , customer_city:string)
LOAN(loan_number:int , branch_name:string , amount:real)
BORROWER(customer_name:string , loan_number:int)
1)Create the above tables by properly specifying the primary keys and foreign keys.

2)Enter at least five tuples for each relation.
3)Find all the customers who have at least two accounts at the main branch.
4)Find all the customers who have an account at all the branches located in a specific city.
5)Demonstrate how you delete all account tuples at every branch located in a specific city.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS6T01	Algorithm Analysis and Design	3	2	1	-

UNIT-I: Preliminaries: Review of growth of functions, Recurrences: The substitution method, the iteration method, The master method , Data Structures for Disjoint Sets.

UNIT-II: Divide and Conquer Approach: Merge Sort, Quick, Medians and order statistics, Strassen's algorithm for Matrix Multiplications.

UNIT-III: Dynamic Programming: Elements of Dynamic Programming, Matrix Chain Multiplication, Longest common subsequence and optimal binary search trees problems.

UNIT-IV: Greedy Algorithms: Elements of greedy Strategy, An activity selection problem, Huffman Codes, A task scheduling problem.

UNIT-V: Graph Algorithms: Representation of graphs, Breadth First Search, Depth First Search, Topological Sort, Strongly Connected Components, Algorithm for Kruskal's and Prim's for finding Minimum cost Spanning Trees, Dijkstra's and Bellman Fort Algorithm for finding Single source shortest paths. All pair shortest paths and matrix multiplication, Floyd-Warshall algorithm for all pair shortest paths.

UNIT-VI: String matching: The naïve string Matching algorithm, the Rabin-Karp Algorithm, String Matching with finite automata, The Knuth-Morris Pratt Algorithm.

Np-Complete Problem : Polynomial-Time verification, NP-Completeness and reducibility, NP-Completeness proof, NP-complete problems.

Text books:

1. T . H. Cormen, C. E. Leiserson, R.L. Rivest, Clifford Stein, " Introduction to Algorithm", 2nd Ed., PHI,2004.

REFERENCES BOOKS:

1. A.V. Aho,J.E. Hopcroft, J.D. Ullman, "The Design and Analysis of Computer Algorithms", Addition Wesley, 1998.
2. Ellis Horowitz and Sartaz Sahani, " Computer Algorithms", Galgotia publications,1999.
3. D. E. Knuth, " The Art of Computer Programming", 2nd Ed., Addison Welsey, 1998.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS6T02	Software engineering	3	2	1	-

UNIT-1: Introduction : Software crisis, software processes & characteristics, software life cycle models, waterfall, prototype, evolutionary and spiral models.
Software project planning : size estimation like lines of code & function count, cost estimation models, COCOMO, COCOMO-II, Putnam resource allocation model, risk management.

UNIT-II: Requirements Engineering: Requirements Engineering, Initiating the process, Eliciting Requirements, Building the Requirements Model, Negotiating, Validating requirements, Requirements Analysis, Scenario-Based Analysis, Requirements Modeling strategies, Flow-Oriented Modeling, Class based modeling, requirement analysis using DFD, Data dictionaries & ER diagrams, requirements documentation SRS, , nature of SRS, characteristics & organization of SRS.

UNIT-III: Design Process, Design Concepts, The Design Model: Data Design, Architectural, interface Design Elements.
Architectural Design: Software Architecture, Architectural Styles, Architectural Design, User Interface Design: Rules, User Interface Analysis and Design, Applying Interface Design Steps, Issues, Web App Interface Design Principles

UNIT-IV: Software testing : Testing process, design of test cases, functional testing: Boundary value analysis, equivalence class testing, decision table testing, cause effect graphing, structural testing, path testing, data flow and mutation testing, unit testing, integration and system testing, debugging, alpha & beta testing, testing tools & standards.

UNIT-V: Software metrics : software measurements : What & Why , token count , halstead software science measures, design metrics, data structure metrics, information flow metrics.

Software reliability : importance, hardware reliability & software reliability, failure and faults, reliability models, basic model, logarithmic poisson model, software quality models, CMM & ISO 9001.

UNIT-VI: Software maintenance : Management of maintenance, maintenance process, maintenance models, regression testing, reverse engineering, software re-engineering, configuration management, documentation.

TEXT BOOKS :

1. K.K.Aggarwal & Yogesh Singh, " Software engineering ", 2nd Ed. , New age international,2005.
2. R.S. Pressman, " Software engineering- A practioner's approach ", 5th Ed., Mcgraw Hill Int. Ed., 2001.

3.Pressman R., "Software Engineering, A Practitioners Approach", 7th Edition, Tata MCGraw Hill Publication,2010, ISBN 978-007-126782-3

REFERENCE BOOKS :

1. Stephen R. Schach, " classical & object oriented software engineering ", IRWIN,TMH,1996.
2. James peter, W. Pedrycz, " Software engineering : An engineering approach ", John Wiley & Sons, 2004.
3. I. Sommerville, " Software engineering ", Addision Wesley, 2004.
4. K. Chandrasehakhar, " Software engineering & quality assurance ",BPB,2005.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS56T03	Compiler Design	3	2	1	-

UNIT-I: Classification of grammars, Context free grammars, Deterministic finite state automata (DFA) Non –DFA.

UNIT-II: Scanners Top down parsing, LL grammars, Bottom up parsing, Polish expression, Operator Precedence grammar, IR grammars, Comparison of parsing methods, Error handling.

UNIT-III: Symbol table handling techniques, Organization for non-block and block structured languages.

UNIT-IV: Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N- tuple and syntax trees, Semantic analysis and code generation.

UNIT-V: Code optimization, Folding, redundant sub-expression evaluation, Optimization within iterative loops.

TEXT BOOKS:

1. Tremblay, et al., "The Theory and practice of compiler Writing", McGraw Hill, New York,1985.
2. A. Holub, "Compiler Design in C",PHI, 2004.
3. Aho, Ullman & Ravi Sethi, " Principles of Compiler Design", Pearson Education, 2002.

REFERENCES BOOKS:

1. Andrew L. Appel, " Modern Compiler Implementation in C", Delhi, Foundation Books,2000.
2. Dick Grune et. Al., " Modern Compiler Design ", Wiley Dreamtech, 2000.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS6T04	Distributed Systems	3	2	1	-

Unit I: Characterization of Distributed System: Introduction, Examples of distributed system, Resource sharing and the web Challenges. Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamports & vectors logical clocks, Causal ordering of messages, global state, termination detection.
Distributed Mutual Exclusion : Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Unit II: Distributed Deadlock Detection : system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms , edge chasing algorithms.
Agreement Protocols : Introduction, System models, classification of Agreement Problem, Byzantine agreement PROBLEM, Consensus problem, Interactive consistency problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in distributed Database system.

Unit III: Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Security: Overview of Security techniques, Cryptographic algorithm, Digital signature Cryptography pragmatics,
Case studies: Needhamschroeder, Kerberos, SSL & Millicent. Distributed File Systems: File service Architecture, Sun network File System , Recent advances.

Unit IV: Transaction and Concurrency Control: Transactions, Nested Transaction, Locks , Optimistic Concurrency Control, Timestamp ordering, Comparison of methods for concurrency control.
Distributed Transaction: Flat and nested distributed transactions, Atomic Commit protocols, Replication: System

model and group communication, Fault-tolerant services, highly available services, Transaction with replicated data.

Unit V: Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithm, Destination based routing, APP problem, Deadlock free packet switching, Introduction to Wave & traversal algorithms, Election algorithm.
Corba Case Study: CORBA RMI, CORBA services.

TEXT BOOKS :

Coulouris, Dollimore, Kind berg, "Distributed Systems: Concepts and Design", Pearson Education.
Singhal & Shivrati, " Advanced concepts in Operating System", McGraw – Hill.
Tel, Gerald, " Introduction to Distributed Algotithm", Oxford Universit Press.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS6T05	Advanced Computer Networks	4	3	1	-

UNIT I: Review of Physical & Data link layer, ISDN,OSI-ISO Reference model,TCP/IP protocol, Frame Relay, ATM

UNIT II: ARP and RARP, Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview).

UNIT III: UDP,U TCP (Flow Control, Error Control, Connection Establishment),

UNIT IV: Application layer : DNS, SNMP, RMON, Electronic Mail, WWW,HTML, SMTP.

Unit V: Internetworking Network Layer design issues, IPV4, IPV6, ICMP(V4&V6)

UNIT VI: Functions and responsibilities, Network planning and implementation, Sub-netting, Bandwidth management, security issues, Tools for BW and security management, Security Issues and tools for BW

TEXT BOOKS :

1. B.A. Forouzan, " TCP/IP Protocol Suite ", TMH, 2nd Ed., 2004.

REFERENCE BOOKS :

1. U. Black, " Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings,"Computer Communications Networks", PHI, 1999.
3. W. Stallings, "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addision Wesley,1999.
4. Michael A. Miller,"Data & Network Communications", Vikas Publication, 1996.
5. William A. Shay, " Understanding Data Communications & Networks", Vikas Publication, 1999.

6. A.S. Tananbaum,"Computer Networks", 3rd Ed., PHI, 1999.
7. Laura Chappell (ed), " Introduction to Cisco Router Configuration", Techmedia, 1999.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS6T06	Principle of Economic & Accountancy	3	2	1	-

Unit I: Introduction: Nature and Scope of Economics, Concept of micro and macro economics.
Law of demand and determinants of demand, category and types of elasticity of demand. Law of supply and elasticity of supply.

Unit II: Production & Cost theory and Market: Isoquant and iso cost lines, Law of return to scale and the law of variable proportions, Types of Costs: Total average and marginal cost, fixed cost and variable cost, opportunity cost etc
Market: Features of Perfect competition and monopoly, Price output determination under perfect competition.

Unit III: Basics of Accountancy: Various concepts like Journal, Ledger and preparation of trial balance. Concept of Depreciation

Unit IV: Preparation of Final Accounts: Preparation of Trading account, Profit & Loss account and balance sheet

Unit V: Budget and Budgetary control: Concepts of various types of Budgeting and Budgetary Control.

TEXT BOOKS:

1. Khan M & Jain P.K: *Management Accounting*, Tata McGraw Hill.
2. Pandey I.M: *Management Accounting*, Vikas Publishing House, N.Delhi
3. Bhattacharya S K and Dearden J: *Accounting for Management*: Text & Cases, Vikas Pub House.
4. Shashi K.Gupta & R.K.Sharma: Management Accounting, Kalyani.
5. Hingorari N.L & Ramanathan A.R*: Accounting for Management*, Sultan Chand, N.Delhi.
6. Pillai R.S.N & Bhavathi V: *Management Accounting*, Sultan Chand, N.Delhi.
7. Maheswari S.N & S.K: *Financial Accounting*, Vikas Publishing House, N.Delhi.
8. Petersen & Lewis: *Managerial Economics* (Prentice Hall of India)
9. Maheshwari: *Managerial Economics* (Prentice Hall of India)

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS6L01	Algorithm Analysis & Design Lab	1	-	-	2

1) Program for Merge sort using Divide and Conquer method.
2) Program for Strassen's Matrix multiplication using Divide and Conquer method.
3) Program for Binomial and Fibonacci heap.
4) Program for Matrix chain multiplication using Dynamic programming.
5) Program for Longest common subsequence (LCS) using Dynamic programming.
6) Program for 0/1 Knapsack problem using Dynamic programming.
7) Program for Activity-Selection problem using Greedy algorithm.
8) Program for Huffman coding using Greedy algorithm.
9) Program for Fractional Knapsack Problem using Greedy algorithm.
10) Program for BFS & DFS using graph.
11) Program for Topological sort.
12) Program for MST using Prim's and Kruskal's algorithm.
13) Program for Bellman-Ford Algorithm using graph
14) Program for Floyd-Warshall Algorithm using graph.
15) Program for Maximum flow using Ford-Fulkerson algorithm.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS6 L02	Compiler Design Lab	1	-	-	2

1) Write a lex Program to identify a simple and a compound statement.
2) Write a lex Program to count the number of keywords and identifiers in a sentence.
3) Write a lex program to convert an octal number to decimal number.
4) Write a YACC Program to check whether given string a^nb^n is accepted by the grammar
5) Write a YACC program to check the validity of an arithmetic expression.
6) Write a YACC Program to identify an input for the grammar a^nb (n>=10)
7) Write an ANTLr grammar to accept the pascal statement READ(Value) and print a parse tree for the same.
8) Write an ANTLr grammar to perform basic arithmetic operation in a calculator
9) Write an ANTLr grammar to accept a block of PASCAL statements between begin and end and print the parse tree for the same.
10) Write an ANTLr grammar to decide whether given sentence is simple or compound.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS7T01	Advanced Computer Architecture	4	3	1	-

UNIT-I: Parallel computer models: The state of computing, Multiprocessors and multi computers, Multi vector and SIMD computers, Architectural development tracks.
Vector processing principles: Vector instruction types, Vector-access memory schemes.
Parallel Processing: SIMD Architecture and Programming Principles, SIMD parallel Algorithms, SIMD Computers and performance Enhancement .

UNIT-II: Program and network properties: Conditions of parallelism, Data and resource dependences, Hardware and Software parallelism, Program partitioning and Scheduling, Grain size and latency, Program flow mechanisms, Control flow versus data flow, Data flow architecture, Demand driven mechanisms, Comparisons of flow mechanisms.

UNIT-III: Interconnect Architectures: Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory, Multistage and combining network.

UNIT-IV: Processors and Memory Hierarchy: Advanced processor technology, Instruction-set Architectures, CISC Scalar processors , RISC Scalar Processors, Superscalar Processors, VLIW Architectures, Vector and Symbolic processors.

UNIT-V: Memory Technology: Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology.
Backplane Bus Systems: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.

UNIT-VI: Pipelining: Principles and implementation of Pipelining, Classification of pipelining processors, Pipeline Architecture, Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines.

TEXT BOOKS:

(1)Kai Hwang, "Advanced computer architecture",TMH,2000.

REFERENCES BOOKS:

(1) J.P. Hayes, " Computer Architecture and organization", MGH,1998.
(2) M.J.Flynn, " Computer Architecture, Pipelined and parallel processor Design", Narosa publishing,1998.
(3) D.A. Patterson, J.L. Hennessy, " Computer Architecture: A quantitative approach", Morgan Kauffmann,2002.
(4) Hwang and Briggs, " Computer Architecture and Parallel Processing", MGH, 2000.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS7T02	Cryptography & Network Security	3	2	1	-

UNIT-I: Introduction to security attacks, services and mechanisms, Introduction to cryptography. Conventional Encryption: Conventional Encryption model, classical encryption techniques-substitution ciphers & transpositions ciphers, cryptanalysis, stereography, stream and block ciphers. Modern Block Ciphers: Block Ciphers

UNIT-II: Principles, Shannon's theory of confusion and diffusion, fiestal structure, Data Encryption Standards (DES), Strength of DES, Differential & Linear Cryptanalysis of DES, Block Cipher modes of operation, Triple DES, Confidentiality using Conventional Encryption, traffic confidentiality, key distribution, random number generation.

UNIT-III: Introduction to graph, ring and field, Prime and relative prime numbers, modular arithmetic, Fermat's & Euler's Theorem, primality testing, Euclid's Algorithm, Chinese remainder theorem, Discrete logarithms. Principles of public key cryptosystems, RSA algorithm, security of RSA, key management, Diffie- Heilman key exchange algorithm

UNIT-IV: Message Authentication & Hash functions : Authentication requirements, Authentication functions, Message Authentication codes, Hash functions, Birthday attacks, Security of Hash function & MACS, MD5 message digest algorithm, Secure Hash algorithm (SHA). Digital Signatures: Digital Signatures, Authentication protocol, Digital Signature Standards (DSS), proof of digital signature algorithm.

UNIT-V: Authentication Applications: directory authentication service, Electronic Mail security- Pretty Good Privacy (PGP), S/ MIME.IP
Security : Architecture, Authentication Header, Encapsulating security payloads, Combining security associations, Secure Electronic Transaction (SET) .
System Security : Intruders, Viruses and related threads, Firewall design principles, trusted systems.
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Text Books:

1. William Stallings," Cryptography and Network Security:
Principles and Practice" Prentice Hall,New Jersey.
2. Johannes A. Buchmann," Introduction to cryptography", Springer Verlag. Bruce Schiener, " Applird

Cryptography

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS7T03	Industrial Organization & Management	3	2	1	-

Unit I: Plant Location and Locational Economics, Methods of Locational Analysis; Plant Layout- Types, Scheduling, Routing and Dispatching

Unit II: Decision Tools, Decision Tree,
Productivity: Definition, Factor Productivity, Productivity Improvement Tools, SME- Entrepreneurship, Government Initiatives for Development of SMEs

Unit III: Quality Management: Concept of Quality, Control Charts, Latest Trend in Quality Management, TQM, ISO 9000 Series Maintenance Management: Différent types, Latest Trend in Maintenance
Management, TPM Project Management: Definition of Project, Network Analysis, PERT and CPM
Inventory Management: Concept, EOQ Model Safety in Workplace, Fire and Safety

Unit IV: Introduction to Management: Nature and Scope of Management; Functions of Management, Role and Skills of a Manager; Evolution of Management Thoughts; Scientific, Behavioral, Systems and Contingency Approaches.

Unit V: Motivation and Leadership: Concept of Motivation; Motivation Theories; Leaderships, its Qualities and Styles.
Groups and Group Behaviour in Organisation: Types of groups; Group Behaviour and Group role; Group Decision-Making; power and politics; Conflicts and types of conflicts; Sources of Conflict; Managing Conflict, Emotional Intelligence

Text Books:

1. Koontez, Odoneel: *Essentials of Management*, Tata McGraw Hill
2. Fred Luthans: *Organisational Behaviour*, Tata McGraw Hill.
3. Robbins S.P: *Organisational Behaviour*, Prentice Hall of India, N.Delhi.
4. L M Prasad : *Principles of Management*:, Sultan Chand
5. Basu, Sahu, Rajiv: *Industrial Organisation and Management*, PHI

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS7L01	.NET Programming Lab	1	-	-	2

C# programs

1. Program in C# to check whether a number is Palindrome or not.
2. Program in C# to demonstrate Command line arguments processing.
3. Program in C# to find the roots of Quadratic Equation.
4. Program in C# to demonstrate Boxing and unBoxing.
5. Program in C# to implement Stack operations.
6. Program to demonstrate Operator overloading.
7. Program in C# to find the second largest element in a single dimensional array.
8. Program to multiply to matrices using Rectangular arrays.
9. Program to Find the sum of all the elements present in a jagged array of 3 inner arrays.

References

1. Wrtie a VB.Net program to accept a string and convert the case of the characters.
2. Develop a menu based VB.Net application to implement a text editor with cut, copy, paste, save and close operations.
3. Write a program to implement a calculator with memory and recall operations.
4. Develop a Form in VB.NET to pick a date from Calendar control and display the day, month, year details in seperate text boxes.

5. Develop a VB.Net application to perform timer based quiz of 10 questions.
6. Develop a VB.Net application using the File, Direcory and Directory controls to implement a common dialog box.
7. Develop a database application to store the details of students using ADO.NET
8. Develop a database application using ADO.NET to insert,modify, update and delete operations.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS8T01	Artificial Intelligence	3	2	1	-

UNIT-I: Introduction: Introduction to Artificial intelligence, Simulation of sophisticated & Intelligent Behaviour in different area, problem solving in games, natural language, automated reasoning, visual perception, heuristic algorithm versus solution guaranteed algorithms.

UNIT-II: Understanding Natural Languages: Parsing techniques, context free and transformational grammars, transition nets, augmented transition nets, Fillmore's grammars, Shanks conceptual Dependency, grammar free analyzers, sentence generation, and translation.

UNIT-III: Knowledge Representation: First order predicate calculus, Horn Clauses, Introduction to PROLOG, Semantic Nets, Partitioned Nets, Minskey Net frames Case Grammar Theory, Production Rules Knowledge Base, The Interface System, Forward & Backward Deduction.

UNIT-IV: Expert System: Existing Systems (DENDRAL, MYCIN), domain exploration, Meta Knowledge, Expertise Transfer, Self Explaining System.

UNIT-V: Pattern Recognition: Introduction to pattern Recognition, Structured Description, Symbolic Description, Machine perception, Line Finding, Interception, Semantic & Model, Object Identification, Speech Recognition. Programming Language: Introduction to programming Language, LISP, PROLOG.

References:

- Char nick, " Introduction to Artificial Intellegence", Addision Welsey.
- Rich & Knight," Artificial Intellengence" Winston, " LISP", Addision Wesley Marcellous, "
- Expert System Programming", PHI.
- Elamie," Artificial Intellengence", Academic Press.
- Lioyed, " Foundation of logic Programming", Springer Verlag.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS8T02	Software Testing	3	2	1	-

UNIT I:Introduction: What is software testing and why it is so hard? Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitation of Testing, No absolute proof of correctness, Overview of Graph Theory.

UNIT II: Introduction, Need of black box testing, Black box testing Concept, Requirement Analysis, Test case design criteria, Testing Methods, requirement based testing, Positive & negative testing, Boundary value analysis, Equivalence Partitioning class, state based or graph based, cause effect graph based, error guessing, documentation testing & domain testing, design of test cases. Case studies of Black-Box testing.

UNIT III: Introduction, Need of white box testing, Testing types, Test adequacy criteria, static testing by humans, Structure - logic coverage criteria, Cyclomatic Complexity, Basis path testing, Graph metrics, Loop Testing, Data flow testing, Mutation Testing, Design of test cases. Testing of Object oriented systems, Challenges in White box testing, Case-study of White-Box testing

UNIT IV: Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

Reducing the number of test cases:

Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, slice based testing.

UNIT V: Software quality, Quality attribute, Quality Assurance, Quality control & assurance, Methods of quality management, Cost of quality, Quality management, Quality factor, Quality management & project management, Software quality metrics-TQM, Six Sigma, ISO, SQA Model.

UNIT VI: Test organization, Structure of testing, Measurement tools, Testing metrics: Type of metric – Project, Progress, Productivity, Metric plan, Goal Question metric model,
Measurement in small & large system. Other Software Testing: GUI testing, Validation testing, Regression testing, Scenario testing, Specification based testing, Adhoc testing, Sanity testing,

TEXT BOOKS:

1. William Perry, "Effective Methods for software Testing ", John Wiley & Sons, New

York, 1995.
2. Louise Tamres, " Software Testing", Pearson Education Asia, 2002.
3. Software Testing, Second Edition By: Ron Patton, Pearson Education ISBN-13: 978-0-672-32798-8
4. Software testing Principle and Practices By Ramesh Desikan, Pearson Education, ISBN 81-7758-121-X

REFERENCE BOOKS:

1. Effective methods for software testing by William Perry , Willey Publication, ISBN 81-265-0893-0Metric and Model in Software Quality Engineering , By Stephen H Kan, Pearson Education ISBN 81-297-0175-8
2. K.K Aggarwal & Yogesh Singh, " Software Engineering",2nd Ed., New Age International publishers, New Delhi, 2005.
3. Boris Beizer, " Software Testing Techniques", Second Volume, Second Edition, Van Nostrand Reinhold, New York , 1990.
4. Boris Beizer, " Black- Box Testing- Techniques for Functional Testing of Software and System", John wiley & Sons Inc., New York, 1995.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CS8L01	Software Testing Lab	1	-	-	2

1.Write programs in „C" Language to demonstrate the working of the following a. constructs: i) do...while ii) while….do iii) if…else iv) switch v) for
2. A program written in „C" language for Matrix Multiplication fails‖ Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application.
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CS8L02	Artifical Intelligence Lab	1	-	-	2

1) Write a C program to implementation of DFS.
2) Write a C program to implement BFS
3) Write a C program to implement Traveling Salesman problem.
4) Write a C program to implement Simulated Annealing algorithm.
5) Write a C program to implement 8 puzzle problem
6) Write a C program to implement Tower of Hanoi problem
7) Write aC program to implement A* Algorithm
8) Write a C program to implement Hill Climbing Algorithm
9) To Study JESS expert system
10) Study RVD expert system Prolog

1. Describe the following family tree as series of PROLOG facts.

M – Married to
C – Child of

Anthony – M – Mary
| |
C
Harry Hazel – M – Tom

Write queries to answer the following:
a) Who is the sister of Harry?
b) Who is the father of Hazel?

2. The following Diagram depicts name of employees and their supervisors.

Watson Johnson John Banker

Smita Evens

WAP which contain all the supervisor relationship in diagram and answer the given queries.
- who is supervisor of evens
- whom supervisor is Watson

3. Write a PROLOG program that answers about family members and relationships. Include predicates & clauses which define sister, brother, father, mother, Grandchild, grandfather and uncle. The program should be able to

answer question such as following.
Father (X, bob)
Grandson (X, Y)
Uncle (bill, Sue)
Mother (marry, X)

a) Write Query to display P_name and age, P_Name and hobby.
b) Find How many of them are child if age <=15 is child.
c) X will like Y if X & Y are Persons & they are not same in age but they are children & have a common interest then show who likes whom.

4. Write a Prolog code for Monkey Banana Problem.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CSE01	Mobile Computing	4	3	1	-

UNIT I: Issues in mobile Computing, IEEE 802.11 & Blue Tooth, Wireless Multiple access protocols, channel Allocation in cellular systems.,mobile IP, Security issues in mobile computing,

UNIT II: Applications, history of mobile communication, introduction to GSM system, GSM background, GSM operational and technical requirements. cell layout and frequency planning, mobile station, base station systems, switching sub systems, home locations, register, Visiting Location Register (VLR), equipment identity register, echo canceller. GSM network structure, Recent Advances and application Standards in Mobile OS

UNIT III: Time and Frequency Domains representations, structure of TDMA slot with frame; Time organization of signaling channels, frequency hopping. TDMA standards and Applications, Time Organization of signaling Channels

UNIT IV: Mobility Management, Signaling protocols, steps in formation of a call, location updates, MS-PSTN call, PSTNMS call, MS-MS call, call handover. Functioning and types of PSTN networks

UNIT V: Multiplexing issues in time and frequency domains, FDMA, TDMA, CDMA, Data Management Issues, data replication for mobile computers,

UNIT VI: Ad hoc network, Routing Protocol, Global State Routing (GSR), Dynamic State Routing (DSR), Fisheye State Routing (FSR), Ad hoc On-Demand Distance Vector (AODV), Destination, Sequenced Distance-Vector Routing DSDV.

Text Books

1. Asha Mehrotra, GSM System Engg. ,Artech House
2.William C.Y. Lee, Mobile Communication Design Fundamentals , Wily Series In Telecommunication

Reference Books :

1. Jerry D. Gibson, The Mobile Communication Handbook , IEEE Press
2. Jochen Schiller, Mobile Communication, Pearson Education Asia

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
ECE02	Digital Image Processing	4	3	1	-

UNIT-I: Image: Image formation, imaging geometry, perspective and other transformation, stereo imaging, elements of visual perception. Digital image: Sampling and quantization, Serial and parallel Image processing systems.

UNIT-II: Signal processing : Fourier, Walsh-Hadamard, discrete cosine and hotelling transforms and their properties, Fileters, correlators and convolbers. Image enhancement: Contrast modification, Histogram specification, smoothing , sharpening, frequency domain enhancement, pseudo-color image enhancement.

UNIT-III: Image Restoration: Unconstrained and constrained restoration, Wiener filter, motion blur removal, geometric and radiometric correction. Image data compression: Huffman and other codes transform compression, two- tone image compression, block coding, run-length coding, contour coding.

UNIT-IV: Segmentation techniques: Thresholding approaches, region growing , relaxation, lines and edge detection approaches, edge linking, supervised and unsupervised classification techniques, remotely sensed image analyzing and application.

UNIT-V: Shape analysis: Gestalt principles, shape number, moment fourier and other shape descriptors, skeleton detection, Hough transforms, topological and textural analysis, shape matching.

UNIT-VI: Practical Applications: Fingerprint Classification, signature verification, text recognition, map understanding, biological cell classification.

Text Books:

- Ganzalez and Wood: Digital Image Processing, Addision Wesley, 1993
- Rosenfeld and Kak: Digital Picture Processing Vol. I & Vol.II, Academic 1982.

- How: Digital Document Processing, Wiley Interscience, 1983.
- Ballard and Brown: Computer Vision, Prentice Hall, 1983.
- Pavlidis: Algorithm for graphics and Image Processing, Computr Sc. Press, 1982.
- Wayne Niblack: AN Introduction to Digital Image Processing, Prentice Hall, 1986
- Milan Sonka, Vaclav Hlavac, Roger Boyle, " Image Processing, Analysis and machine Vision", Vikas

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE03	Embedded Systems	4	3	1	-

UNIT-I: Introduction to an embedded systems design & RTOS: Introduction to Embedded system, processor in the system, Microcontroller, Memory Devices , Embedded System project Management, ESD and co-design issues in systems development process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In circuit emulator, Use of software tools for development of an ES.

UNIT-II:
Inter-Process Communication and Synchronization of Processes, Tasks and Threads, Problem of Sharing Data by Multiple Tasks, Real Time Operating Systems: OS Services, I/O Subsystems, Interrupt Routines in RTOS Environment, RTOS Task Scheduling model, Interrupt Latency and Response times of the tasks.

UNIT-III: Overview of Microcontroller: Microcontroller and Embedded Processors, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, The Program Counter and ROM Spaces in the 8051, Data types, 8051 Flag Bits ad PSW Register, 8051 Register Banks and Stack Instructions set, Loop and Jump Instructions, Call Instructions, Time delay generations and calculations, I/O port Programming Addressing Modes, accessing memory using various addressing modes, Arithmetic Instructions and programs, Logical instructions BCD and ASCII application programs, Single-bit instruction Programming, Reading input pins Vs. port Latch, Programming of 8051 Timers, Counter Programming.

UNIT-IV: Communication of 8051 : Basics of Communications, Overview of RS-232, I2C Bus, UART, USB, 8051 connections to RS -232, 8051 serial Communication Programming, 8051 interrupts, Programming of timer interrupts, Programming of External of hardware interrupts, Programming of the serial communication interrupts Interrupt Priority in the 8051.

UNIT-V: Interfacing with 8051 : Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the Keyboard, Interfacing a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory.

TEXT BOOKS :

1. Raj Kamal," Embedded Systems", TMH, 2004.
2. M.A. Mazidi and J.G. Mazidi, " The 8051 Microcontroller and Embedded Systems", PHI, 2004.

REFERENCES BOOKS :

1. David E . Simon, " An Embedded Software Primer", Pearson Education, 1999.
2. K. J. Ayala, " The 8051 Microcontroller", Penram International, 1991.
3. Dr. Rajiv Kapadia, " 8051 Microcontroller & Embedded Systems", Jaico Press.
4. Dr. Prasad, " Embedded Real Time System", Wiley Dreamtech, 2004.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE04	E-commerce & ERP	4	3	1	-

UNIT I: Introduction and Concepts: Network and commercial transactions- Internet and other novelties; networks and electronic transactions today, Model for commercial transactions; Internet environment- internet advantage, world wide web and other internet sales venues; Online commerce solutions.

UNIT II: Security Technologies: Insecurity Internet; A brief introduction to Cryptography; Public Key Solution; Key distribution and certification; prominent cryptographic applications, Protocols for Public Transport of Private Information: Security Protocols; secure protocols; secure hypertext transfer protocols; Secure sockets layers; Integrating security protocols into the web; Non technical provide. Electronic Commerce Providers: On –Line Commerce options: Company profiles. Electronic Payment Systems: Digital Payment Systems; First virtual internet payment system; cyber cash model.

UNIT III: Electronic Payment Methods: Updating traditional transactions; secure online transaction models; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks, Digital Currencies: Optional process of Digicash, Ecash Trail; Using Ecash; Smart cards, Electronic Data Interchange; Its basics; EDI versus Internet and EDI over Internet.

UNIT IV: On-line Commercial Environment: Servers and commercial environment; Netscape product line; Netscape commerce server; Microsoft internet explorer and servers; open market, Strategies, Techniques and Tools: Internet strategies: Internet Techniques, Shopping techniques and outline selling techniques; Internet tools, Electronic Commerce Online Resources and guide to the CD-ROM

UNIT V: ERP- An Enterprise Perspective; Production Finance, Personnel disciplines and their relationship, Transiting environment, MIS Integration for disciplines, Case Study, Information/Workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

UNIT VI: ERP- Resource Management Perspective; Functional and Process of Resource. Management, Basic Models of ERP system- HRD, Personnel Management , Training and Development, Skill Inventory, Material Planning and Control, Inventory, Forecasting, Manufacturing, Production Planning, Production Scheduling,

Production Control, Sales and Distribution, Finance, Resource Management in global scenario, dynamic data management in complex global scenario.

UNIT VII: ERP- Information system Perspective: Evolution of Application Software Technology Management, EDP, MIS, DBMS, DSS OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR, SCM, REP, CRM, Information Communication Technology, E- Business, E- Commerce, EDI, ERP-Key Managerial Issues: Concept Selling, IT Infrastructure , Implication of ERP Systems on Business Organization , Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, Public Service and Organizations (PSO) Project, ERP selection issues, Return of Investment, Pre and Post Implementation issues.

TEXT BOOKS:

1. Pete Loshin and P.A. Murphy,"Electronic Commerce" Jaico Publishing House, 1999.
2. Gary Schneider and James T. Perry,"Electronic Commerce" by Thomson learning,2001.
3. S.Sadagopan, " Enterprise Resource Planning", Tata McGraw Hill,1999.
4 Alexis Leon, " Enterprise Resource Planning", Tata McGraw Hill,2000.

REFERENCE BOOKS:

1. kalakota, "Frontiers of E- Commerce: Addition Wesley long man Publishers, 1999.
2. Kamlesh Bajaj & Debjani Nag, " E- Commerce: The cutting edge of Business" Tata Mcgraw Hill,2000.
3. Trepper, "E- Commerce stragies", Prentice Hall of India, 2001.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE05	Real Time System	4	3	1	-

UNIT-I: Introduction Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency.

UNIT-II: Real Time Scheduling Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems.

UNIT-III: Resources Access Control Effect of Resource Contention and Resource Access Control (RAC), Nonpreemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects.

UNIT-IV: Multiprocessor System Environment Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints.

UNIT-V: Real Time Communication Model of Real Time Communication, Priority-Based Service and Weighted Round-Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems.

TEXT BOOKS:

1. Real Time Systems by Jane W. S. Liu, Pearson Education Publication.

2. Real-Time Systems: Scheduling, Analysis, and Verification by Prof. Albert M. K. Cheng, John Wiley and Sons Publications

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CSE06	Linux Internal	4	3	1	-

UNIT I: Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT II: Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT III: Files: File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

UNIT IV: Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs. Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

UNIT V: Interprocess Communication : Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.

UNIT VI: Semaphores-Kernel support for semaphores, Unix system V APIs for semaphores. Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

UNIT VII: Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with semaphores and with Mutexes, Example programs.

UNIT VIII: Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.(UNIT III to UNIT VIII)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. Unix Network Programming ,W.R.Stevens,PHI.
4. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE07	Multimedia Technologies	4	3	1	-

UNIT I: Introductory Concepts: Multimedia-Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia- The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain & ODA etc.

UNIT II: Multimedia-Hardware and Software: Multimedia Hardware- Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software- Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

UNIT III: Multimedia- making it work- multimedia building blocks- Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different Compression algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, 3D Effects, Flash etc.

UNIT IV: Multimedia and Internet: History, Internet working, Connections, Internet Services, The world Wide Web, Tools for the WWW- web Servers, Web Browsers, Web Page makers and editors, Plug-Ins and Delivery Vehicles, HTML , VRLM, Designing for the WWW-Working on the web , Multimedia Applications- Media Communication, Media Consumption, Media Entertainment, Media games.

UNIT V: Multimedia-looking towards future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing,Assembling and delivering a project-planning and costing, Designing and Producing, content and talent, Delivering , CD-ROM technology.

TEXT BOOKS:

1. Steve Heath,"Multimedia & Communication Systems",Focal Press,UK,1999.
2. TAy Vaughan,"Multimedia Making it Work", TMH,1999.
3. K. Andleigh And K. Thakkar,"Multimedia System Design",PHI, PTR,2000.

REFERENCES BOOKS:

1. Keyes,"Multimedia Handbook",TMH,2000.
2. Ralf Steinmetz and Klara Naharstedt,"Multimedia: Computing, Communication & Applications",Pearson,2001.
3. Steve Rimmer,"Advanced Multimedia Programming",MHI,2000.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE08	Data Mining	4	3	1	-

Unit I: Introduction : Basic Data Mining Tasks, Data Mining Issues, Data Mining Metrics, Data Mining from a Database Perspective.

Unit II: Data Mining Techniques : A Statistical Perspective on Data Mining, Similarity Measures, Decision Trees, Neural Networks, Genetic Algorithms.

Unit III: Classification : Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms, Combining Techniques.

Unit IV: Clustering : Similarity and Distance Measures, Hierarchical Algorithms, Partitional Algorithms, Clustering Large Databases, Clustering with Categorical Attributes.

Unit V: Association Rules : Basic Algorithms, Parallel and Distributed Algorithms, Incremental Rules, Advanced Association Rule Techniques, Measuring the Quality of Rules.

Unit VI: Advanced Techniques : Web Mining, Spatial Mining, Temporal Mining.

Text Books

1. J. Han and M. Kamber. Data Mining: Concepts and Techniques, 2nd Ed. Morgan Kaufman. 2006.

References

1. M. H. Dunham. Data Mining: Introductory and Advanced Topics. Pearson Education. 2001.
2. I. H. Witten and E. Frank. Data Mining: Practical Machine Learning Tools and Techniques. Morgan Kaufmann. 2000.
3. D. Hand, H. Mannila and P. Smyth. Principles of Data Mining. Prentice-Hall. 2001.

Subject Code	***Course name***	***Credits***	***Lectures***	***Tutorials***	***Practical***
CSE09	.NET & C# Programming Language	4	3	1	

UNIT-I: The net framework design goals, different components of net framework, CLR, Assemblies and manifests, IL,CTS.

UNIT-II: Introduction to C# programming:- C# data types, Classes, methods, properties methods and indexers, attributes and interfaces, Exception Handling, operator overloading.

UNIT-III: Delegates and Event Handlers, Multithreaded programming, Querying metadata with reflection.

UNIT-IV: Introduction to ASP.Net programming, building forms with web controls, validating user input, debugging asp.net pages, ASP.net application Configuration and ASP.net Security.

UNIT-V: ADO.Net, Ado.net object Model, understanding databinding, using datagrids, using sqlServer with ASP.Net.

Text Books -

- .Net Framework Essentials/thuan thai and Hoang Q.lam/O' reilly publications.
- Inside c#/Tom Archer/Microsoft press.
- Asp.net bible/Mridula parihar/Wiley dreamtech India pvt. Limited.

- Beginning c#, Wrox publications.
- Beginning asp.net, Wrox publications.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE10	Distributed Database	4	3	1	

UNIT – I: Features of Distributed versus Centralized Databases, Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Distributed Databases, Study of DDBMS architectures, Comparison of Homogeneous and Heterogeneous Databases, Analysis of Concurrency control in distributed databases

UNIT – II: Implementation of Distributed query processing. Distributed data storage, Distributed transactions, Commit protocols, Availability, Distributed query processing, Directory systems-ldap, Distributed data storage and transactions. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT – III: Introduction to Decision Support, Data Warehousing, Creating and maintaining a warehouse. Introduction to Data warehouse and OLAP, Multidimensional data model, Data Warehouse architecture, OLAP and data cubes, Operations on cubes, Data preprocessing need for preprocessing, Multidimensional data model, OLAP and data cubes, Data warehousing Concepts, Study of Data preprocessing need for preprocessing, Simulating and maintaining a Warehouse, Analysis of Data preprocessing.

UNIT – IV: Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries. The Management of Distributed Transactions, A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT - V: Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT – VI: Introduction to data mining , Data mining functionalities, clustering - k means algorithm, classification - decision tree, Baysian classifiers, Outlier analysis, association rules - apriori algorithm, Introduction to text mining, Implementing Clustering - k means algorithm, Analysis of Decision tree.

UNIT - VII: Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management,

Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

REFERENCES:
1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill
2. Jiawei han, Micheline Kamber, "Data Mining: Concepts and systems", Morgan Kaufmann Publishers
3. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database system concepts", 5 th Edition, McGraw Hill International Edition
REFERENCES:
1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez – Pearson Education.
2. Raghu Ramkrishnan, Johannes Gehrke, "Database Management Systems", Second Edition, McGraw Hill International Edition
3. Thomas Connolly,Carolyn Beg ―Database Systems :Practical approach to design implementation and management ― third edition, Pearson education

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE11	Wireless Network	4	3	1	-

UNIT I: SERVICES AND TECHNICAL CHALLENGES 9
Types of Services, Requirements for the services, Multipath propagation, Spectrum Limitations, Noise and Interference limited systems, Principles of Cellular networks, Multiple Access Schemes.

UNIT II: WIRELESS PROPAGATION CHANNELS 9
Propagation Mechanisms (Qualitative treatment), Propagation effects with mobile radio, Channel Classification, Link calculations, Narrowband and Wideband models.

UNIT III : WIRELESS TRANSCEIVERS 9
Structure of a wireless communication link, Modulation and demodulation – Quadrature Phase Shift Keying, □/4-Differential Quadrature Phase Shift Keying, Offset-Quadrature Phase Shift Keying, Binary Frequency Shift Keying, Minimum Shift Keying, Gaussian Minimum Shift Keying, Power spectrum and Error performance in fading channels.

UNIT IV: SIGNAL PROCESSING IN WIRELESS SYSTEMS 9
Principle of Diversity, Macrodiversity, Microdiversity, Signal Combining Techniques, Transmit diversity, Equalisers-Linear and Decision Feedback equalisers, Review of Channel coding and Speech coding techniques.

UNIT V: ADVANCED TRANSCEIVER SCHEMES 9
Spread Spectrum Systems- Cellular Code Division Multiple Access Systems- Principle, Power control, Effects of multipath propagation on Code Division Multiple Access, Orthogonal Frequency Division Multiplexing – Principle, Cyclic Prefix, Transceiver implementation, Second Generation(GSM, IS–95) and Third Generation Wireless Networks and Standards

TEXT BOOKS:
1. Andreas.F. Molisch, “Wireless Communications”, John Wiley – India, 2006.
2. Simon Haykin & Michael Moher, “Modern Wireless Communications”, Pearson Education, 2007.
REFERENCES:
1. Rappaport. T.S., “Wireless communications”, Pearson Education, 2003.
2. Gordon L. Stuber, “Principles of Mobile Communication”, Springer International Ltd., 2001.

3. Andrea Goldsmith, Wireless Communications, Cambridge University Press, 2007.

Subject Code	*Course name*	*Credits*	*Lectures*	*Tutorials*	*Practical*
CSE12	Fuzzy Logic and Neural Network	4	3	1	-

Unit I: Neural Networks Characteristics: History of Development in neural networks, Artificial neural net terminology, model of a neuron, Topology, Types of learning. Supervised, Unsupervised learning.

Unit II: Basic Learning laws, Hebb's rule, Delta rule, widrow and Hoff LMS learning rule, correlation learning rule instar and ouster learning rules.

Unit III: Unsupervised Learning: Competitive learning, K-means clustering algorithm, Kohonen's feature maps. Radial Basis function neural networks- recurrent networks, Real time recurrent and learning algorithm. Introduction to Counter propagation Networks- CMAC Network, ART networks, Application of NN in pattern recognition, optimization, Control, Speech and decision making.

Unit IV: Fuzzy Logic: Basic concepts of Fuzzy logic, Fuzzy vs Crisp set, Linguistic variables, membership functions, operations of Fuzzy sets, Fuzzy if-then rules, Variables inference techniques, defuzzification techniques, basic Fuzzy interference algorithm, application of fuzzy logic , Fuzzy system design implementation , useful tools supporting design.

Text Books -

1. Berkin Riza C and Trubatch, " Fuzzy System design principles- Building Fuzzy IF-THEN rule bases", IEEE Press.
2. Yegna Narayanan, "Artificial Neural Networks". 8th Printing. PHI(2003)
3. Patterson Dan W, "Introduction to artificial Intelligence and Expert systems", 3rd Ed., PHI
4. Simon Haykin, "Neural Networks" Pearson Education.
5. Yen and Langari, "Fuzzy Logic: Intelligence, Control and Information", Pearson Education.
6. Jacek M Zaurada, "Introduction to artificial neural Networks Jaico Publishing Home, Fouth Impression.