4-Years B.TECH
COMPUTER SCIENCE ENGINEERING

WITH EFFECT FROM 2010-11 ADMITTED BATCH

SYLLABI
(Tentative)

CHAIRMAN
BOARD OF STUDIES

DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING
COLLEGE OF ENGINEERING
ANDHRA UNIVERSITY
VISAKHAPATNAM-3

ANDHRA UNIVERSITY
COLEGE OF ENGINEERING - AUTONOMOUS
VISAKHAPATNAM

COMMON SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH

I/IV B.E./B.TECH. (FOUR YEAR COURSE) – SEMESTER SYSTEM
I & II SEMESTERS

CODE NO.	COURSE	CREDITS	PERIODS L/T/Lab.	Exam. Hours	Sessional Marks	Exam Marks	Total Marks
ENG 1001	ENGLISH	2	2 + 1	3	30	70	100
ENG 1002	MATHEMATICS-I	4	3	3	30	70	100
ENG 1003	MATHEMATICS-II	4	3	3	30	70	100
ENG 1004	PHYSICS THEORY	4	3	3	30	70	100
ENG 1005	CHEMISTRY THEORY	4	3	3	30	70	100
ENG 1006	HISTORY OF SCIENCE AND TECHNOLOGY	2	3	3	30	70	100
ENG 1007	COMP. PROG. & NUM. METHODS	4	3	3	30	70	100
ENG 1008	ENGINEERING GRAPHICS	5	2 + 4	3	30	70	100
ENG 1009	PHYSICS LABORATORY	2	--	3	50	50	100
ENG 1010	CHEMISTRY LABORATORY	2	--	3	50	50	100
ENG 1011	WORKSHOP	2	--	3	50	50	100
ENG 1012	PROGRAMMING LABORATORY	2	--	3	50	50	100
	TOTAL	37	39		440	760	1200

II/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 2nd YEAR I -SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH

Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 2.1.1	**ELECTRONICS**	3	1		70	30	100	4
CSE 2.1.2	ELEMENTS OF ELECTRICAL ENGINEERING	3	1		70	30	100	4
CSE 2.1.3	DATA STRUCTURES	3	1		70	30	100	4
CSE 2.1.4	DESCRETE MATHEMATICAL STRUCTURES-I	3	1		70	30	100	4
CSE 2.1.5	PROBABILITY, STATISTICS & QUEUING THEORY	3	1		70	30	100	4
CSE 2.1.6	DIGITAL LOGIC DESIGN	3	1		70	30	100	4
CSE 2.1.7	**ELECTRONICS LAB.**			3	50	50	100	2
CSE 2.1.8	DATA STRUCTURES LAB.			3	50	50	100	2
						TOTAL CREDITS		28

II/IV B.TECH.(CSE) II - SEMESTER

B.TECH. (CSE) 2nd YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH

Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 2.2.1	**OPERATIONS RESEARCH**	3	1		70	30	100	4
CSE 2.2.2	DISCRETE MATHEMATICAL STRUCTURES-II	3	1		70	30	100	4
CSE 2.2.3	MICROPROCESSORS-I	3	1		70	30	100	4
CSE 2.2.4	COMPUTER ORGANIZATION	3	1		70	30	100	4
CSE 2.2.5	OBJECT ORIENTED PROGRAMMING	3	1		70	30	100	4
CSE 2.2.6	ENVIRONMENTAL STUDIES	3	1		70	30	100	2
CSE 2.2.7	MICROPROCESSORS-I LAB.	--	--	3	50	50	100	2
CSE 2.2.8	**OBJECT ORIENTED PROGRAMMING LAB**.	--	--	3	50	50	100	2
						TOTAL CREDITS		26

III/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 3rd YEAR I-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 3.1.1	MICROPROCESSOR-II	3	1	--	70	30	100	4
CSE 3.1.2	**SYSTEM PROGRAMMING**	3	1	--	70	30	100	4
CSE 3.1.3	ELECTIVE – I	3	1	--	70	30	100	4
CSE 3.1.4	FORMAL LANGUAGES & AUTOMATA THEORY	3	1	--	70	30	100	4
CSE 3.1.5	FILE STRUCTURES	3	1	--	70	30	100	4
CSE 3.1.6	OPERATING SYSTEMS	3	1	--	70	30	100	4
FE01	**FREE ELECTIVE-I**	**3**	**1**	**--**	**70**	**30**	**100**	**4**
CSE 3.1.7	OPERATING SYSTEMS LAB.	--	--	3	50	50	100	2
CSE 3.1.8	**MICROPROCESSOR-II LAB**	--	--	3	50	50	100	2
CSE 3.1.9	SOFT SKILLS LAB.	--	--	3		100	100	1
							TOTAL CREDITS	33

ELECTIVE-I :

[1]. COMPUTER GRAPHICS, [2]. DIGITAL SIGNAL PROCESSING , [3]. FAULT TOLERANT COMPUPTING, [4]. COMBINATORICS & GRAPHIC THEORY.

III/IV B.TECH.(CSE) II - SEMESTER

B.TECH. (CSE) 3rd YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 3.2.1	COMPILER DESIGN	3	1	--	70	30	100	4
CSE 3.2.2	DESIGN & ANALYSIS OF ALGORITHMS	3	1	--	70	30	100	4
CSE 3.2.3	DATA BASE MANAGEMENT SYSTEMS	3	1	--	70	30	100	4
CSE 3.2.4	DATA COMMUNICATIONS	3	1	--	70	30	100	4
CSE 3.2.5	ELECTIVE – II	3	1	--	70	30	100	4
CSE 3.2.6	COMPUTER ARCHITECTURE	3	1	--	70	30	100	4
CSE 3.2.7	**FILE STRUCTURES LAB.**	--	--	3	50	50	100	2
CSE 3.2.8	DBMS LAB.	--	--	3	50	50	100	2
							TOTAL CREDITS	28

ELECTIVE - II

[1]. PRINCIPLES OF PROGRAMMING LANGUAGE [2]. BIO-INFORMATICS [3]. IMAGE PROCESSING. [4]. VHDL

* The industrial training will be for three weeks during the summer after third year second semester.

IV/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 4th YEAR I-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 4.1.1	OBJECT ORIENTED SOFTWARE ENGG.	3	1	--	70	30	100	4
CSE 4.1.2	COMPUTER NETWORKS	3	1	--	70	30	100	4
CSE 4.1.3	ARTIFICIAL INTELLIGENCE	3	1	--	70	30	100	4
CSE 4.1.4	MANAGEMENT PRINCIPLES	3	1	--	70	30	100	4
CSE 4.1.5	ELECTIVE-III	3	1	--	70	30	100	4
CSE 4.1.6	**WEB TECHNOLOGIES**	3	1	--	70	30	100	4
CSE 4.1.7	GRAPHICS & MULTIMEDIA LAB.	--	--	3	50	50	100	2
CSE 4.1.8	OBJECT ORIENTED SOFTWARE ENGG. LAB.	--	--	3	50	50	100	2
CSE 4.1.9	INDUSTRIAL TRAINING & SEMINAR*	-	-	-		100	100	2
							TOTAL CREDITS	30

ELECTIVE-III :

[1]. EMBEDDED SYSTEMS, [2]. NEURAL NETWORKS & FUZZY LOGIC [3]. RANDOM PROCESSES IN ENGINEERING.

* The industrial training will be for three weeks during the summer after third year second semester and assessment will be done in the 4th year first semester with a seminar on the training he/she got.

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IV/IV B.TECH.(CSE) II – SEMESTER

B.TECH. (CSE) 4th YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 4.2.1	DISTRIBUTED OPERATING SYSTEMS	3	1	--	70	30	100	4
CSE 4.2.2	CRYPTOGRAPHY AND NETWORK SECURITY	3	1	--	70	30	100	4
CSE 4.2.3	ELECTIVE-IV	3	1	--	70	30	100	4
FE02	**FREE ELECTIVE-II**	**3**	**1**	**--**	**70**	**30**	**100**	**4**
CSE 4.2.4	DATA COMMUNICATIONS & NETWORK PROGRAMMING LAB	--	--	3	50	50	100	2
CSE 4.2.5	PROJECT	--	--	3	50	50	100	8
							TOTAL CREDITS	26

ELECTIVE-IV:
[1]DATA WARE HOUSING & DATA MINING ,[2] SERVICE ORIENTED ARCHITECTURE

II/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 2nd YEAR I -SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 2.1.1	**ELECTRONICS**	3	1		70	30	100	4
CSE 2.1.2	ELEMENTS OF ELECTRICAL ENGINEERING	3	1		70	30	100	4
CSE 2.1.3	DATA STRUCTURES	3	1		70	30	100	4
CSE 2.1.4	DISCRETE MATHEMATICAL STRUCTURES-I	3	1		70	30	100	4
CSE 2.1.5	PROBABILITY, STATISTICS & QUEUING THEORY	3	1		70	30	100	4
CSE 2.1.6	DIGITAL LOGIC DESIGN	3	1		70	30	100	4
CSE 2.1.7	**ELECTRONICS LAB.**			3	50	50	100	2
CSE 2.1.8	DATA STRUCTURES LAB.			3	50	50	100	2
							TOTAL CREDITS	28

CSE 2.1.1 ELECTRONICS Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

I. Semiconductors :
Electronic Emission from metal carrier concentration in an intrinsic Semiconductors open circuited PN junction – diffusion.

II. PN Junction Diode :
PN Junction Diode, VI Characteristics of PN Junction Diode, capacitate effects in PN Junction Diode, Quantitative theory of PN Junction Diode.

III. Special Devices:
Principles, Working of zero diode, Tunnel diode, Varactor diode, Schottky diode, SCR and UJT.

IV. Transistors:
The bipolar junction Transistor – Operation of PNP and NPN Transistors – Transistor Circuit configurations- characteristics of a CE configurations – h parameter, low frequency small signal equivalent circuit of a Transistor.

V. Transistor Biasing and thermal stabilization:
Transistor Biasing, stabilization, Different methods of transistor biasing – Fixed bias, Collector feedback bias – self bias – Bias compensation.

VI. Field Effect Transistors:
Junction Field Effect Transistors (JFET) – JFET characteristics, JFET Parameters, Small equivalent circuit – MOSFETS – Depletion and Enhancement MOSFETS.

VII. Rectifying circuits:
Half wave and full wave rectifiers – Bridge rectifiers – rectifier efficiency, Ripple and regulation – Shunt capacitor filter – Zener regulation.

VIII. Transistor Amplifiers:
CE, CB, CC amplifier configurations – Analysis using h- parameters – Multistage amplifier – RC coupled amplifier – frequency response curve and bandwidth.

TEXT BOOK:
Electronic Device and Circuits by Sanjeev Gupth.

REFERENCE:
Integrated Electronics by Millman & Halkias.

CSE 2.1.2 ELEMENTS OF ELECTRICAL ENGINEERING Credits:4

Instruction: 3 Periods & 1 Tut / week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Magnetic circuits: Definitions of magnetic circuit, Reluctance, Magneto-motive force), magnetic flux, Simple problems on magnetic circuits, Hysterisis loss.

Electromagnetic Induction: Faraday's laws of Electromagnetic Induction, Induced E.M.F., Dynamically induced E.M.F., Statistically induced EMF, Self Inductance, Mutual Inductance.

D.C. Generators: D.C.Generator principle, construction of D.C. generator, E.M.F equation of D.C. generator, Types of D.C. generator, Efficiency, Characteristics of D.C. generator, Efficiency, Applications of D.C. generator

D.C. Motors: D.C. Motor principle, working of D.C.Motors. significance of back E.M.F., Torque equation of D.C. Motors, Types of D.C. Motors, Characteristics of D.C. Motors, Speed control methods of D.C. Motors, Applications of D.C. Motor. Testing of D.C. Machines : Losses and Efficiency, Direct load test and Swinburne's test.

A.C. Circuits: Introduction to Steady State Analysis of A.C. Circuits, Single and Balanced 3 Phase Circuits.

Transformers: Transformer principle, EMF equation of transformer, Transformer on load, Equivalent circuit of Transformer, Voltage regulation of Transformer, Losses in a Transformer, Calculation of Efficiency and Regulation by Open circuit and Short circuit Tests.

Three phase Inductance Motor: Induction Motor working principle. Construction of 3 Phase induction Motor, Principle of operation. Types of 3 phase induction Motor., Torque Equation of Induction Motor., slip – Torque characteristics., Starting Torque, Torque under running condition., Maximum Torque Equation., Power stages of Induction Motor., Efficiency Calculation of Induction Motor by direct loading.

Alternator: Alternator working principle, EMF equation of Alternator, Voltage Regulation by Sync. Impedance method.

Synchronous Motor: Synchronous Motor principle of Operation, Construction., Methods of starting of synchronous motor

Text Book:
"Elements of Electrical Engineering and Electronics" by V.K.Mehta, S. Chand & Co

Reference Book:
"A First Course in Electrical Engineering" by Kothari.

CSE 2.1.3 DATA STRUCTURES Credits:4

Instruction: 3 Periods & 1 Tut/week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Introduction to Data Structures: Information and Meaning – Representation of Multi- Dimensional Arrays _ Review of C Programming.

The Stack: Primitive operations – As an Abstract Data Type – Implementing the Stack operations in C.

Infix, Postfix and Prefix: Definitions, Evaluation and Conversions using C.

Recursion: Recursive Definition and Processes, Recursion in C and Recursive Implementation of Applications. Simulation of Recursion – Efficiency of Recursion.

Queues and Lists: The Queue as Abstract Data Type – Sequential Representation _Types of Queues – Operations – Implementation in C.

Linked List: Operations – Implementation of Stacks, Queues and priority Queues in C. **Circular Lists**: Insertion, Deletion and Concatenation Operations _ Stacks and Queues as Circular Lists _ Doubly Linked Lists _Applications.

Trees: Binary Trees Operations and Applications.

Binary Tree Representation: Node Representation – Implicit array Representation – Choice of Representation – Binary Tree Traversal – Threaded Binary Trees and their Traversal – Trees and their Applications

Sorting: General Background: Efficiency – The big 0 Notation – Efficiency of Sorting. Bubble Sort and Quick Sort and their Efficiency – Selection Sorting – Binary Tree Sort – Heap Sort – Insertion Sorts – Shell Sort – Address calculation Sort – Merge and Radix Sorts.

Searching: Basic Searching Techniques: Dictionary as an Abstract Data Type – Algorithmic Notation – Sequential Searching and its Efficiency – Binary Search – Interpolation Search.

Tree Searching: Insertion into a Binary Search Tree – Deleting from a Binary Search Tree – Efficiency of Binary Search Tree operation

Graphs and Their Application: Graphs: Application of Graphs – Representation of Graphs in C – Transitive closure – Warshall's Algorithm – Shortest Path Algorithm.

Linked Representation of Graphs: Dijikstra's Algorithm – Organizing the set of Graph Nodes – Application to Scheduling and its implication.

Graph Traversal and Spanning Forests – Undirected Graph and their Traversals, Applications and Efficiency – Minimal Spanning Trees –Prim's and Kruskal's Algorithms.

Textbooks:

1. Data Structures Using C and C++ Yddish Langsam, Moshe J. Augenstein and Aaron M. Tanenbaum, Prentice Hall Of India (2nd Edition) (Chapters 1 to 8)

2. Data Structures, Algorithms and Applications with C++, Sahani Mc-Graw Hill.

Note: All Implementation are Using C Language only.

CSE 2.1.4 DISCRETE MATHEMATICAL STRUCTURES - I Credits:4

Instruction: 3 Periods & 1 Tut/week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Introduction: Sets-Operations on sets-relations-functions-Proof methods and problem solving strategies-Fundamentals of Logic- Logical inferences-Methods of proof of an implication-First Order logic and Other Proof methods-Rules of inference for quantified Propositions-Mathematical Induction

Elementary Combinatorics: Basics of Counting- Combinations and Permutations-Their Enumeration with and without repetition-Binomial coefficients-Binomial and Multinomial Theorems-The Principle of Inclusion-Exclusion.

Recurrence Relations: Generating Functions of Sequences-Calculating their Coefficients-Recurrence relations-Solving recurrence relations-Method of characteristic Roots- Non-homogeneous Recurrence relations and their solutions

Relations and Digraphs: Relations and Directed Graphs-Special Properties of Binary relations- Equivalence Relations-Ordering Relations-Lattices and Enumeration- Operations on relations-Paths and Closures-Directed Graphs and Adjacency matrices- Applications of sorting, searching and topological sorting.

Graphs: Basic concepts-Isomorphism-subgraphs-Planar Graphs-Euler's formula- Multigraphs and Euler circuits-Hamiltonian graphs-Chromatic numbers-Four color theorem.

Trees: Trees and their properties-Trees as graphs-spanning trees-Directed trees-Binary trees-Their traversals-Arithmetic and Boolean expressions as trees- height balanced trees.

Text Book:

"Discrete Mathematics for computer scientists & Mathematicians" by Joe L. Mott, Abraham Kandel & T. P. Baker, Prentice Hall of India Ltd, New Delhi

Reference Books:

1) "Discrete mathematics and its applications" by Keneth. H. Rosen, , Tata McGraw- Hill Publishing Company, New Delhi
2) " Discrete mathematics" by Richard Johnsonbaug, Pearson Education, New Delhi

CSE 2.1.5 PROBABILITY, STATISTICS & QUEUING THEORY Credits:4

Instruction: 3 Periods & 1 Tut/week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Probability: Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Bayes theorem of probability and Geometric probability.

Random variables and their properties, Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties, Transformation variables, Mathematical expectations, probability generating functions.

Probability Distributions / Discrete distributions: Binomial, Poisson Negative binominal distributions and their properties. (Definition, mean, variance, moment generating function., Additive properties, fitting of the distribution.)

Continuous distributions: Uniform, Normal, exponential distributions and their roperties.

Curve fitting using Principle of Least Squares.

Multivariate Analysis: Correlation, correlation coefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association, χ^2 – test for goodness of fit, test for independence.

Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation.

Testing of Hypothesis: Formulation of Null hypothesis, critical region, level of significance, power of the test.

Small Sample Tests: Testing equality of .means, testing equality of variances, test of correlation coefficient, test for Regression Coefficient.

Large Sample tests: Tests based on normal distribution

Queuing theory: Queue description, characteristics of a queuing model, study state solutions of M/M/1: α Model, M/M/1 ; N Model.

Text Book: Probability, Statistics and Random Processes by T.Veerarajan, Tata McGraw Hill Reference Book: Probability & Statistics with Reliability, Queuing and Computer Applications by Kishor S. Trivedi , Prentice Hall of India ,1999

CSE 2.1.6 DIGITAL LOGIC DESIGN Credits:4

Instruction: 3 Periods & 1 Tut. /week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Binary Systems, Boolean Algebra and Logic Gates.

Digital Systems. Binary Numbers. Number Base Conversions. Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers. Binary Codes. Binary Storage and Registers. Binary Logic

Basic Definitions. Axiomatic Definition of Boolean Algebra. Basic Theorems and Properties of Boolean Algebra. Boolean Functions. Canonical and Standard Forms. Other Logic Operations. Digital Logic Gates. Integrated Circuits.

2. Combinational Logic Design, Gate-Level Minimization.

The Map Method. Four-Variable Map. Five-Variable Map. Product of Sums Simplification. Don't-Care Conditions. NAND and NOR Implementation. Other Two- Level Implementations. Exclusive-OR Function. Hardware Description Language

(HDL).

Combinational Logic

Combinational Circuits. Analysis Procedure. Design Procedure. Binary Adder- Subtractor. Decimal Adder. Binary Multiplier. Magnitude Comparator. Decoders. Encoders. Multiplexers. HDL For Combinational Circuits.

3. Sequential Logic Design, Synchronous Sequential Logic

Sequential Circuits. Latches. Flip-Flops. Analysis of Clocked Sequential Circuits. HDL For Sequential Circuits. State Reduction and Assignment. Design Procedure.

Registers ad Counters.

Registers. Shift Registers. Ripple Counters. Synchronous Counters. Other Counters. HDL for Registers and Counters.

Fundamentals of Asynchronous Sequential Logic

Introduction. Analysis Procedure. Circuits With Latches. Design Procedure. Hazards

4. Memory and Programmable Logic

Introduction. Random-Access Memory. Memory Decoding. Error Detection and Correction. Read-Only Memory. Programmable Logic Array. Programmable Array Logic. Sequential Programmable Devices.

TEXT BOOK : Digital Design, 3rd Edition, M. Morris Mano, Pearson Education, Inc., 2002

REFERENCE BOOKS:

1. Digital Logic Design Principles, Norman Balabanian and Bradley Carlson, John Wiley & Sons(Asia) Pte. Ltd., 2002
2. Fundamentals of Digital Circuits, A. Ananda Kumar, PHI, 2002
3. Digital Circuits and Design, 2nd Edition,S Salivahanan and S Arivazhagan, Vikas Publishing House Pvt. Ltd., 2003
4. Fundamentals of Digital Logic with VHDL Design, Stephen Brown and Zvonko Vranesic, Tata McGraw-Hill Edition, 2002

CSE2.1.7 ELECTRONICS LAB Credits:2

Lab: 3 Periods /week Sessional Marks: 50
Univ.-Exam : 3 Hours Univ-Exam-Marks:50

1. Familiarization of electronics component and equipments like C.R.O, Function generator and power supplies etc.

2. To study the V-I characteristics of pn junction diode and determine static resistance and dynamic resistance.

3.To study the characteristics of zener diode and hence determine the dynamic resistance from the characteristics.

4. Determine the voltage regulation of zener diode stabilizer.

5. To study and plot the wave form of half wave and full wave rectifier with and without capacitor filter.

6.. To study and plot the input and output characteristics of common emitter transistor and calculate its input and output resistance.

7. To study and plot the input and output characteristics of common base transistor and calculate its input and output resistance.

8. To study the characteristics of FET(Field effect transistor) and hence calculate dynamic (rd) , mutual conductance (gm) and amplification factor(μ).

9. To study the frequency response of single stage CE amplifier and hence calculate the band width (3dbBW).

10. To demonstrate the operation, characteristics and design of a saturated bipolar transistor switch.

CSE.2.1.8 DATA STRUCTURES LAB Credits:2

Lab: 3 Periods /week Sessional Marks: 50
Univ.-Exam : 3 Hours Univ-Exam-Marks:50

1. Write a program to implement the operations on stacks.
2. Write a program to implement the operations on circular queues
3. Write a program for sorting a list using Bubble sort and then apply binary search.
4. Write a program to create a binary search tree and for implementing the in order, preorder, post order traversal using recursion
5. Write a program for finding the Depth First Search of a graph, and Breadth First Search of a graph
6. Write a program for converting a given infix expression to postfix form
7. Write a program for evaluating a given postfix expression
8. Write a program for implementing the operations of a dequeue
9. Write a program for the representation of polynomials using circular linked list and for the addition of two such polynomials
10. Write a program for quick sort
11. Write a program for Heap sort
12. Write a program for Merge sort.
13. a) Write a program for finding the transitive closure of a digraph
    b) Write a program for finding the shortest path from a given source to any vertex in a digraph using Dijkstra's algorithm

II/IV B.TECH.(CSE) II - SEMESTER

B.TECH. (CSE) 2nd YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 2.2.1	**OPERATIONS RESEARCH**	3	1		70	30	100	4
CSE 2.2.2	DISCRETE MATHEMATICAL STRUCTURES-II	3	1		70	30	100	4
CSE 2.2.3	MICROPROCESSORS-I	3	1		70	30	100	4
CSE 2.2.4	COMPUTER ORGANIZATION	3	1		70	30	100	4
CSE 2.2.5	OBJECT ORIENTED PROGRAMMING	3	1		70	30	100	4
CSE 2.2.6	ENVIRONMENTAL STUDIES	3	1		70	30	100	2
CSE 2.2.7	MICROPROCESSORS-I LAB.	--	--	3	50	50	100	2
CSE 2.2.8	**OBJECT ORIENTED PROGRAMMING LAB**.	--	--	3	50	50	100	2
						TOTAL CREDITS		26

CSE 2.2.1 OPERATIONS RESEARCH Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Overview of operations Research: OR models – OR Techniques

Linear Programming: Introduction – Graphical solution; Graphical sensitivity analysis – The standard form of linear programming problems – Basic feasible solutions - unrestricted variables – simplex algorithm – artificial variables – Big M and two phase method – Degeneracy - alternative optima – unbounded solutions – infeasible solutions.

Dual problems- Relation between primal and dual problems – Dual simplex method Transportation model – starting solutions. North West corner Rule - lowest cost method –Vogels approximation method – Transportation algorithms –Assignment problem – Hungarian Method.

Network Models : Definitions – CPM and PERT – Their Algorithms
Integer Programming : Branch and Bound Algorithms cutting plan algorithm.

Dynamic Programming: Recursive nature of dynamic programming – Forward and Backward Recursion

Deterministic Inventory Models : Static EOQ Models – Dynamic EOQ models.

Game theory: Two person Zero Sum Games – Mixed strategy games and their Algorithms.

Books:

1. Introduction to Operations Research by HILLIER/LIEBERMAN, Tata McGraw Hill
2. Operations Research by R Panneerselvan, Prentice Hall of India.

CSE 2.2.2 DISCRETE MATHEMATICAL STRUCTURES - II Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ-Exam : 3 Hours Univ-Exam Marks:70

Introduction: Relations-Types of relations-Matrix representation of relations- Representation of relations as graphs-Ordering-Partial Ordering-Functions-Composition of Functions-Binary and n-ary Operations-Characteristic Functions of a set-Hashing functions-Recursion-Primitive recursive functions-Recursive functions.

Algebraic Structures: Algebraic Systems-Semi groups and Monoids-Grammars and Languages-Polish expression and their compilation-Groups-The application of residue arithmetic to Computers- Group Codes

Lattices: Lattices as Partially Ordered Sets-Properties of Lattices- Sublattices-Direct Product and Homomorphisms-Isomorphisms-Modular Lattices-Distributive lattices- Complimented lattices –Their Properties

Boolean Algebra: Definition- Subalgebra-Direct Product-Homomorphisms- Isomorphisms-Boolean Functions-Representation of Boolean Functions-Minimization of Boolean Functions-Design examples of Boolean Algebra

Computability: Introduction-Finite State Machines-Introductory Sequential Circuits- Equivalence of Finite State Machines-Finite State Acceptors and Regular Grammars- Turing Machines and Partial Recursive Functions.

Text Book:

Discrete Mathematical Structures with applications to computer science by J. P. Trembley & R. Manohar Tata McGraw-Hill Publishing Company, New Delhi.

Reference Books:

1) Discrete and combinatorial mathematics by Ralph. G. Grimaldi Pearson Education, New Delhi
2) Elements of discrete mathematics by C. L. Liu, Tata McGraw-Hill Publishing Company, New Delhi.

CSE 2.2.3 Microprocessors - I Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ-Exam : 3 Hours Univ-Exam Marks:70

The 8085A µP. Architecture and Instruction Set:
Introduction to Microprocessors and Microcomputers, Internal Architecture and Functional/Signal Description of typical 8-bit µP.- 8085, Instruction Set and Timing Diagrams of 8085 µP.

Programming the 8085 µP.:
Assembly Language Programming Requirements, Programming Techniques: Looping, Counting, and Indexing, Counter and timing Delays, Stack and Subroutines, Code Conversion, BCD Arithmetic, 16-bit data Operations, Interrupts and Interrupt Service Routines

The 8086 µP. Architecture and Instruction Set:
Internal Architecture and Functional/Signal Description of 8086/8088
Segmented Memory, Maximum-Mode and Minimum-Mode Operation, Addressing Modes, Instruction Set and Timing Diagrams

Programming the 8086 µP.:
Assembly Language Requirements, Data Definition, COM and EXE program Files
Programming techniques: Logical Processing, Arithmetic processing, Time Delay Loops Procedures, Data tables, Modular programming, and Macros

TEXT BOOKS:
1.Microprocessor Architecture, Programming, and Applications with the 8085 Ramesh S. Gaonkar, 4th Edition, Penram International, 1999
2. The 80x86 Family, Design, Programming and Interfacing, John E.Uffenbeck, 3rd Edition, Pearson Education Inc., 2002

REFERENCE BOOK:
1. IBM PC Assembler Language and Programming, Peter Abel, 5th Edition, Pearson Education Inc., 2001
2. The 8088 and 8086 Microprocessors, Programming, Interfacing, Software, Hardware and Applications, Water A. Triebel and Avtar Singh, 4th Edition, Pearson Education Inc., 2003
3. Microprocessors and Interfacing, Programming and Hardware, 2nd Edition, Douglass V. Hall, TMH Edition, 1999

CSE 2.2.4 COMPUTER ORGANIZATION Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ-Exam : 3 Hours Univ-Exam Marks:70

Register Transfer and Micro operations :
Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

Basic Computer Organization and Design:
Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description.

Microprogrammed Control:
Control Memory, Address Sequencing, Micro program Example.

Central Processing Unit:
Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.

Computer Arithmetic :
Introduction, Addition and Subtraction, Decimal Arithmetic Unit.

Input-Output Organization:
Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access.

Memory Organization:
Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Text Book:
Computer System Architecture, M.Morris Mano ,Third Edition, Pearson Education Inc., 2003

Reference Book:
Computer Systems Organization and Architecture, John D. Carpinelli ,Pearson Education Inc., 2003

CSE 2.2.5 OBJECT ORIENTED PROGRAMMING LAB Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ-Exam : 3 Hours Univ-Exam Marks:70

1. Procedural Paradigms, Object Oriented Paradigm, Concept of Data Abstraction Encapsulation, Inheritance and Polymorphism
2. Introduction to U.M.L : Description of various U.M.L. Diagrams with examples.

C++

3. **Basics of Object Oriented Programming** : benefits of OOP, data types, declarations, expressions and operator precedence, functions, scope of variables
4. **Introduction to OOP** : Classes and objects, Constructors & Destructors, Operator Overloading & type conversions.
5. **Inheritance** : Derived classes, syntax of derived classes, making private members inheritable, single, multilevel, multiple, hierarchical, hybrid inheritance
6. **Polymorphism**: Pointers, virtual functions and polymorphism- pointers to objects, this pointer, pointers to derived classes, virtual and pure virtual functions.
7. **Templates, Exception handling, console I/O and File I/O**: class templates, Function templates, member function templates, exception handling, managing console I/O operations, working with files.

JAVA

8. **Intoduction to JAVA**: Introduction, Classes and Objects, Arrays, strings and Vectors, Exception Handling, Managing I/O files in Java.
9. **Packages and Interface, and Multi threading:** Packages, Interfaces, creating, extending, stopping, blocking threads, thread states, thread methods, exceptions, priority in threads, synchronization, Runnable interface.

Text Books:

1. JAVA 2.0- Complete Reference : Herbert Schildt & F. Naughton.
2. Introduction to JAVA PROGRAMMING by Y.Daniel Liang (PHI)
3. Object oriented Programming using C++: E. Balagurusamy, PHI.
4. Programming with JAVA- A primer: E. Balagurusamy, PHI
5. The Unified Modeling Languages user Guide by Grady Booch Etal.(Pearson Education)

References:

6. Object Oriented Programming in C++: N. Barkakati, PHI
7. Object Oriented Programming through C++ by Robat Laphore.
8. Object Oriented Analysis and Design by Andrew Haigh – (Tata Mcgrah Hjill.)

CSE 2.2.6 ENVIRONMENTAL STUDIES Credits:2

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ-Exam : 3 Hours Univ-Exam Marks:70

Module 1: Introduction
(a)Definition, Scope and importance
(b)Measuring and defining environmental development: indicators (1 lecture)
Module 2: Ecosystem
(a) Introduction, types, characteristic features, structure and functions of Ecosystems
-Forest –Grass land -Desert -Aquatic (lakes, rivers and estuaries) (2 lectures)
Module 3: Environmental and Natural Resources management
(a)Land resource
-Land as a resource -Common property resource -Land degradation -Soil erosion and desertification -Effects of modern agriculture, fertilizer – pesticide problems
(b) Forest resources
Use and over-exploitation-Mining and dams- their effects on forest and tribal people
©Water resources
-Use and over-utilization of surface and ground water-Floods and droughts-Water logging and salinity-Dams –benefits and costs-Conflicts over water
(d) Energy resources
Energy needs-Renewable and non-renewable energy source-Use of alternate energy sources - Impact of energy use on environment (8 lectures)
Module 4: Bio-diversity and its conservation
(a)Value of bio-diversity-consumptive and productive use, social, ethical, aesthetic and option values
(b)Bio-geographical classification of India- India as a mega diversity habitat
©Threats to biodiversity- Hot spots, habitat loss, poaching of wildlife, loss of species, seeds etc.
(d)Conservation of bio-diversity- In-situ and Ex-situ conservation (3 lectures)

Module 5: Environmental Pollution Local and Global Issues

(a)Cause, effects and control measures of
Air Pollution- Indoor air pollution-Water pollution- Soil pollution- Marine pollution-Noise pollution-Solid waste management, composting, vermiculture- Urban and industrial wastes, recycling and reuse
(b)Nature of thermal pollution and nuclear hazards
©Global Warming
(d)Acid rain
(e)Ozone depletion (8 lectures)
Module 6 : Environmental problems in India
(a)Drinking water, Sanitation and Public health
(b)Effects of activities on the quality of environment
Urbanization-Transportation- Industrialization- Green revolution
©Water scarcity and Ground Water depletion
(d)Controversies on major dams- resettlement and rehabilitation of people: problems and concerns
(e)Rain water harvesting, cloud seeding and watershed management (5 lectures)

Module 7: Economy and Environment
(a)The economy and environment interaction
(b)Economics of development, preservation and conservation
©Sustainability: theory and practice
(d)Limits to Growth
(e)Equitable use of resources for sustainable lifestyles

(f)Environmental Impact Assessment (4 lectures)

Module 8: Social Issues and the Environment

(a)Population growth and environment
(b)Environmental education
©Environmental movements
(d)Environment vs Development (2 lectures)

Module 9: Institutions and Governance

(a)Regulation by Government
(b)Monitoring and Enforcement of Environmental regulation
©Environmental Acts
Water (Prevention and Control of pollution) act-Air (Prevention and Control of pollution) act-Envt. Protection act-Wild life Protection act-Forest Conservation act-Coastal Zone Regulations
(d)Institutions and policies relating to India
(e)Environmental Governance (5 lectures)

Module 10: International Conventions

(a)Stockholm Conference 1972
(b)Earth Summit 1992
©World Commission for environmental Development (WCED) (2 lectures)

Module 11: case Studies

(a)Chipko movement
(b)Narmada Bachao Andolan
©Silent Valley Project
(d)Madhura Refinery and Taj Mahal
(e)Industrialization of Pattancheru
(f)Nuclear reactor in Nagarjuna Sagar
(g)Tehri dam
(h)Ralegaon Siddhi (Anna Hazzare)
(i)Kolleru lake-aquaculture
(j)Florosis in Andhra Pradesh (3 lectures)

Module 12: Field Work

(a) Visit to a local area to document and mapping environmental assests- river/ forest/ grassland/ Hill/ Mountain.
(b) Study of local environment- common plants, insects, birds
©Study of simple ecosystems- pond, river, hill, slopes etc.
(d) Visit to Industries, Water treatment plants, affluent treatment plants. (5 lectures)

CSE 2.2.7 MICROPROCESSORS - I LAB Credits: 2

Lab: 3 Periods/week Sessional Marks: 50
Univ-Exam : 3 Hours Univ-Exam Marks:50

Digital Logic Design Experiments :

1. TTL Characteristics and TTL IC Gates
2. Multiplexers & Decoders
3. Flip-Flops
4. Counters
5. Shift Registers
6. Binary Adders & Subtractors
7. A L U

Assembly Language Programming :

1. 8085 Assembly Language Programming according to theory course microprocessors-I using the following trainers :

   Keyboard Monitor of 8085µP Trainer.
   Serial Monitor of 8085µP Trainer with Terminal
   8085 Line Assembler of 8085µP Trainer with PC as Terminal
   8085 Cross Assembler using In-Circuit Emulator (ICE) with 8085µP Trainer and PC as Terminal

2. 8086 Assembly Language Programming according to theory course Microprocessor-I using the following : PC Assembler using TASM or MASM, TD or SYMDEB or CVD(Code View debugger)

Graded Problems are to be used according to the syllabus of MICROPROCESSORS-I

CSE 2.2.8 OBJECT ORIENTED PROGRAMMING LAB Credits:2

Lab: 3 periods/week Sessional Marks: 50
Univ_Exam: 3 hours. Univ_Exam marks: 50

C++

1.Program that implements stack operations using classes and objects.
2.Program performing complex number addition using friend functions.
3.Program for complex number addition using operator overloading.
4.Program to perform string operations by overloading operators.
5.Program on hierarchical inheritance showing public,private and protected inheritances.
6.Program for computation of students result using hybrid inheritance.
7.Program implementing bubble-sort using templates.
8.Program on virtual functions.
9.Program for handling PushOnFull and PopOnEmpty Exceptions for a Stack.
10.Program for copying one file to another file using streams.
11..Program for writing and reading a class object to a file.

JAVA

1.Program on packages.
2. Write a program to copy contents of a file into another file using File streams.
3.Program on hierarchical inheritance.
4.Program for handling ArrayIndexOutofBoundsException and Divide-by-zero Exception.
5.Program for custom exception creation.
6.Program on multi-threading showing how CPU time is shared among all the threads.
7.Program for Producer-Consumer problem using threads.
8. Program for BannerApplet.
9. Program for implementing a Calculator .
10. Program for implementing mouse events, (drawing lines, curves using mouse etc.,)
11.Program on JDBC connectivity where database is Oracle .
12. Program to send messages across two machines using simple sockets.

III/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 3rd YEAR I-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 3.1.1	MICROPROCESSOR-II	3	1	--	70	30	100	4
CSE 3.1.2	**SYSTEM PROGRAMMING**	3	1	--	70	30	100	4
CSE 3.1.3	ELECTIVE – I	3	1	--	70	30	100	4
CSE 3.1.4	FORMAL LANGUAGES & AUTOMATA THEORY	3	1	--	70	30	100	4
CSE 3.1.5	FILE STRUCTURES	3	1	--	70	30	100	4
CSE 3.1.6	OPERATING SYSTEMS	3	1	--	70	30	100	4
FE01	**FREE ELECTIVE-I**	**3**	**1**	**--**	**70**	**30**	**100**	**4**
CSE 3.1.7	OPERATING SYSTEMS LAB.	--	--	3	50	50	100	2
CSE 3.1.8	**MICROPROCESSOR-II LAB**	--	--	3	50	50	100	2
CSE 3.1.9	SOFT SKILLS LAB.	--	--	3		100	100	1
						TOTAL CREDITS		33

ELECTIVE-I :

[1]. COMPUTER GRAPHICS, [2]. DIGITAL SIGNAL PROCESSING , [3]. FAULT TOLERANT COMPUPTING, [4]. COMBINATORICS & GRAPHIC THEORY.

CSE 3.1.1 MICROPROCESSORS - II Credits:4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam:3 Hours Univ_ Exam Marks:70

Interfacing Semiconductor Memories:
Semiconductor Memories: Classification, Internal Organisation & Functional Description. Interfacing SRAMs, and EPROMs to 8085/8086

Interfacing I/O Devices:
Interfacing Characteristics of I/O Devices, I/O Device addressing methods, I/O Device Programming Methods.

Interfacing Peripheral ICs to Intel 8085/8086:
Parallel I/O Interface - 8255, Serial I/O Interface – 8251, Timer Interface - 8253, Keyboard/Display Interface - 8279, Interrupt Controller Interface - 8259

Interfacing Data Converters to 8085/8086:
D/A Conversion Methods, A/D Conversion methods, Interfacing DAC, Interfacing ADC.

Introduction to Micro controllers:
Intel 8051 Architecture and Programming

Introduction to Hardware and Software of PCs :
Hardware Organization, DOS Internals, ROM BIOS and BIOS Function Calls, DOS Function Calls, Introduction to Pentium Processors

TEXT BOOKS:

1.Microprocessor Architecture, Programming, and Applications with the 8085 Ramesh S. Gaonkar, 4th Edition, Penram International, 1999
2. The 80x86 Family, Design, Programming and Interfacing, John E.Uffenbeck, 3rd Edition, Pearson Education Inc., 2002
3. Kenneth J.Ayala, 8051 Microcontroller architecture, programming and applications, 2nd Edition, Penram International Publications, 1999

REFERENCE BOOKS:

1. BARRY B. BREY, The Intel Microprocessors 8086/8088, 80186/80188,80286,80386 and 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, Architecture, Programming and Interfacing, 6th Edition, Pearson Education Inc., 2003
2 Walter A. Tribel and Avtar Singh, The 8088 and 8086 Microprocessors, Programming, interfacing, Software, Hardware, and Applications, 4th Edition, Pearson Education Inc., 2003
3. Microprocessors and Interfacing, Programming and Hardware, 2nd Edition, Douglass V. Hall, TMH Edition, 1999
4. Sanjay K Bose, Hardware and Software of Personal Computers, New Age International (P) Ltd., 1991
5. Myke Predko, Programming and Customizing the 8051 Microcontroller, TMH, 1999

CSE 3.1.2 SYSTEMS PROGRAMMING Credits:4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam:3 Hours Univ_ Exam Marks:70

Introduction to Systems Programming, Introduction to Assembly Language Programming - Introduction to Instruction Formats, Data formats - Role of Base Register, Index Register.

Introduction to Assembler, databases used in assembler design, Design of Assembler - Single Pass & Double Pass.

Introduction to Macros, various types of Macros, Design of Macro Processor - Single Pass & Double Pass. Introduction to Loaders, functions of a loader, types of Loaders, databases used in Loaders, Design of Loaders - Absolute & DLL.

Introduction to Software Tools, Text editors, Interpreters, Program Generators, Debug Monitors.

TextBook: Systems Programming by Donovan
Tata Mc Graw Hill

Reference: System Programming by Dhamdhere
Tata Mc Graw Hill, IInd Revised Edition

CSE 3.1.3 ELECTIVE-I COMPUTER GRAPHICS Credits:4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam:3 Hours Univ_ Exam Marks:70

Introduction: Usage of Graphics and their applications, Presentation Graphics- Computer Aided Design- Computer Art- Entertainment- Education and Training- Visualization- Image Processing- Graphical User Interfaces
Over view of Graphics systems: Video Display Devices- Raster Scan systems-random scan systems-Graphics monitors and workstations-Input devices-hard copy devices- Graphics software
Output primitives: Points and Lines-Line Drawing Algorithms- Loading the Frame buffer- Line function- Circle-Generating Algorithms- Ellipse Generating Algorithms- Other Curves- Parallel Curve Algorithms-Curve Functions-Pixel Addressing- Filled Area Primitives-Filled Area Functions- Cell Array- Character Generation
Attributes of Output Primitives: Line and Curve Attributes-Color and Gray scale levels- Area Fill Attributes-Character Attributes-Bundled Attributes- Inquiry Functions- Antialiasing
Two Dimensional Geometric Transformations: Basic Transformations- Matrix Representations-Homogeneous Coordinates-Composite Transformations-Other Transformations-Transformations between Coordinate Systems-Affine Transformations- Transformation Functions- Raster methods for Transformations
Two Dimensional Viewing: The viewing Pipeline-Viewing Coordinate Reference Frame-Window-to-Viewport Coordinate Transformation-Two Dimensional Viewing Functions-Clipping Operations-Point Clipping-Line Clipping-Polygon Clipping-Curve Clipping- Text and Exterior Clipping
Structure And Hierarchical Modeling: Concepts of Structures and Basic models- Editing - Hierarchical Modeling with Structures-GUI and Interactive Input Methods- Windows and Icons- Virtual Reality Environments
Three Dimensional Concepts and Object representations: 3D display methods-3D Graphics-Polygon Surfaces-Curved Lines and Surfaces- Quadratic Surfaces-Super Quadrics-Blobby Objects-Spline Representations- Cubic Spline methods-Bézier Curves and Surfaces- B Spline Curves and Surfaces
Three Dimensional Geometric and Modeling Transformations: Translation- Rotation-scaling-Other Transformations-Composite Transformations-3D Transformation Functions-Modeling and Coordinate Transformations.
Three Dimensional Viewing: Viewing Pipeline- Viewing Coordinates- Projections- View Volumes-General Projection Transformations-Clipping-Hardware Implementations-Three Dimensional Viewing

Chapters 1 to 12 except 10-9 to 10-22 of the Text book

Text Book: Computer Graphics C Version by Donald Hearn & M. Pauline Baker Pearson Education, New Delhi, 2004

Reference Books:

1) Procedural Elements for Computer Graphics by David F. Rogers, Tata McGraw Hill Book Company, New Delhi, 2003
2) Computer Graphics: Principles & Practice in C by J. D. Foley, S. K Feiner, A Van Dam F. H John, Pearson Education, 2004
3) Computer Graphics using Open GL by Franscis S Hill Jr Pearson Education, 2004.

CSE 3.1.3 ELECTIVE-I DIGITAL SIGNAL PROCESSING Credits:4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam:3 Hours Univ_ Exam Marks:70

An Overview of Digital Signal Processing and its Applications

Introduction to Programmable DSPs

Architecture of TMS320C3X

Addressing Modes and Assembly language Instructions of 'C3X

Application Programs in C3X

An Overview of TMS320C54X

TMS320C54X Assembly language Instructions

Application Programs in C54X FPGA – based DSP

System Design **Text Book:**

Digital Signal Processors, Architecture, Programming and Applications, B.Venkataramani ,M.Bhaskar, TMH, 2002

Reference Books:

1. Digital Signal Processing, A Practical Approach, Emmanuel C. Ifeachor , Barrie W. Jervis, 2nd Edition, Pearson Education, Inc., 2002
2. Digital Signal Processing, Steve White, Thomson Delmar Publications, 2000
3. Digital Signal Processing, A computer Based Approach, Snajit K. Mitra, 2nd Edition, TMH, 2001

CSE 3.1.3 ELECTIVE-I FAULT TOLERANT COMPUTING Credits:4

Instruction: 3 Periods & 1 Tut./week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Basic Concepts of Reliability
Faults in Digital Circuits
Test Generation

Introduction to Fault Tolerant Design of Digital Systems: Fault Tolerance, Static redundancy, Dynamic redundancy, Fault tolerant design of Memory systems, Practical Fault Tolerant Systems: FTMP, ESS, COMTRAC

Introduction to Self-Checking Logic: The two rail Checker,
Design for Testability: Testability, Controllability and Observability, Design of testable Combinational Logic Circuits, Testable design of Sequential Circuits, The scan path technique, Designing testability into logic boards

Text Books:
Fault Tolerant and Fault Testable Hardware Design, Parag K. Lala, PHI, 1985
Reference:
1. Fault Tolerant Computing Theory and Techniques-Volume I, D.K. Pradhan, PHI, 1986
2.. Testing of Digital Systems, Niraj jha and Sandeep Gupta, Cambridge University Press, 2003

CSE 3.1.3 ELECTIVE-I COMBINATORICS & GRAPH THEORY Credits:4

Instruction: 3 Periods & 1 Tut./week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

PART I: COMBINATORICS

1. FOUNDATION: Basics- Sets- Relations- Proof methods- Problem-solving strategies- Mathematical Induction.
2. COMINATORICS: Basics of counting-Combinations and Permutations- Enumeration of Combinations & Permutations without repetitions and without repetitions- with constrained repetitions-Binomial Coefficients-Binomial and Multinomial theorems- Principle of Inclusion- Exclusion
3. RECURRENCE RELATIONS: Generating Functions of Sequences- Calculating Coefficients of Generating Functions- Recurrence Relations- Solving Recurrence Relations using Substitution and Generating Functions- Method of Characteristic Roots-Solutions of homogeneous and inhomogeneous recurrence relations.

PART II GRAPH THEORY

4. FUNDAMENTAL CONCEPTS: what is a Graph-Paths-Cycles-Trails-Vertex Degrees and Counting-Directed Graphs-Trees and Distance-Spanning Trees-Enumeration-Optimization and Trees.
5. MATCHINGS AND CONNECTIVITY : Matchings and Covers-Algorithms and applications of matching-Matchings in General graphs-Cuts and Connectivity-k-connected graphs-Network flow problems.
6. COLORING AND PLANAR GRAPHS: Vertex coloring and upper bounds-Structure of k- chromatic Graphs-Enumerative Aspects-Embeddings and Euler's formula-Characterization of Planar graphs-Parameters of Planarity-Edges and Cycles-Line Graphs and edge-coloring- Hamiltonian Cycles-Planarity-coloring and cycles.

TEXT BOOKS:

1. J.L. Mott, Abraham Kandel & Theodore P. Baker, " Discrete mathematics for Computer Scientists & Mathematics", Prentice-Hall of India Ltd. New Delhi. (Chapters 1,2,3)
2. Douglas B. West, "Introduction to Graph Theory", Pearson Education Asia, New Delhi. (Chapters 1,2,3,4,5,6,7)

REFFERENCE BOOKS:

1. Michel Townsend, "Discrete Mathematics: Applied Combinatorics and graph theory", The Benjamin/Cummings Publishing Company", California.
2. Kenneth H Rosen. "Discrete Mathematics and Its Applications, Tata McGrahHill Publishing Company, New Delhi.
3. Robin J. Wilson, "Introduction to Graph Theory" Pearson Education Asia, New Delhi.

CSE 3.1.4 FORMAL LANGUAGES AND AUTOMATA THEORY Credits: 4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam: 3 Hours Univ_ Exam Marks:70

1. Finite Automata and Regular Expressions:
Basic Concepts of Finite State Systems, Deterministic and Non-Deterministic Finite Automata, Finite Automata with e-moves, Regular Expressions, Minimization of Finite Automata, Mealy and Moore Machines, Two-Way Finite Automate.

2. Regular sets & Regular Grammars:
Basic Definitions of Formal Languages and Grammars, Regular Sets and Regular Grammars, Closure Properties of Regular Sets, Pumping Lemma for Regular Sets, Decision Algorithm for Regular Sets, Myhill-Nerode Theorem, Minimization of Finite Automata.

3. Context Free Grammars and Languages:
Context Free Grammars and Languages, Derivation Trees, Simplification of Context Free Grammars, Normal Forms, Pumping Lemma for CFL, closure properlties of CFL's, Decision Algorithm for CFL.

4. Push down Automata and Deterministic CFL:
Informal Description, Definitions, Push-Down Automata and Context free Languages, Parsing and Push-Down Automata.

5. Universal Turing Machines and Undecidability:
Design and Techniques for Construction of Turing Machines, Undecidability of PCP. Chomsky Hierarchy, Regular Grammars, Unrestricted Grammars, Context Sensitive languages,Relationship between classes of languages.

TEXT BOOKS: Introduction to Automata Theory, Languages & Computation By J.E.Hopcraft & Jeffery D.Ulman – Narosa Publishing Company.

REFERENCE BOOKS:
Theory of Computer Science By Mishra & Chandra Sekharan, PHI.
An Introduction To Formal Languages and Automata,3e By Peter Linz – Narosa Publishing House.

CSE 3.1.5 FILE STRUCTURES Credits:4

Instruction: 3 Periods & 1 Tut /Week Sessional Marks : 30
Univ. Exam : 3 Hours Univ. Exam Marks:70

File Processing Operations
Physical and logical files, opening, reading & writing and closing files in C, seeking and special characters in files, physical devices and logical files, file-related header files in C

Secondary Storage
Disks – organization, tracks, sectors, blocks, capacity, non-data overhead, cost of a disk access,Magnetic Tape – types, performance, organization estimation of tape length and data transmission times, disk vs tape,CD-ROM – CD-ROM as a file structure, physical organization, strengths and weakness of cd-roms, storage hierarchy

Byte Journey and buffer Management
File manager, I/O buffer, I/O processing, buffer strategies and bottlenecks

File Structure Concepts
A stream file, field structures, reading a stream of fields, record structures and that uses a length indicator, Mixing numbers and characters – use of a hex dump, reading the variable length records from the files

Managing records in C files
Retrieving records by keys, sequential search, direct access, choosing a record structure and record length, header records, file access and file organization

Organizing files for performance
Data compression, reclaiming space – record deletion and storage compaction, deleting fixed-length records for reclaiming space dynamically, deleting variable-length records, space fragmentation, replacement strategies.

Indexing
Index, A simple index with an entry sequenced file, basic operations on an indexed, entry sequenced file, indexes that are too large to hold in memory, indexing to provide access by multiple keys, retrieval using combination of secondary keys, improving the secondary index structure – inverted lists

Indexed sequential file access and prefix B^+ Trees
Indexed sequential access, maintaining a sequence set, adding a simple index to the sequence set, the $^+$ tree, simple prefix B^+ content of the index: separators instead of keys, the simple prefix B tree maintenance, index set block size, internal set block size, internal structure of index set blocks: a variable B^+ treorder B-tree, loading a simple prefix

Special Note: **Implementation in C only**

Hashing
Collisions in hashing, a simple hashing algorithms, hashing functions and record distributions, memory requirements, collision resolution by progressive overflow, buckets, deletions

Extendable hashing
Working of extendable hashing, implementation, deletion, extendable hashing performance

Designing file structure for CD-ROM
Tree structure on CD-ROM, hashing files on CD-ROM, CD-ROM file structure

Text Book: File Structures – An Object Oriented Approach with C^{++} by Michael J. Folk, Bill Zoellick and Greg Riccardi,, Pearson

CSE 3.1.6 OPERATING SYSTEMS Credits:4

Instruction: 3 Periods & 1 Week./Week Sessional Marks : 30
Univ_ Exam : 3 Hours Univ_ Exam Marks:70

Introduction: What IS OS; History of Operating Systems, Operating System Concepts, Operating Systems Structure

Processes: Introduction to Processes, Inter Processor Communication, Classical IPC Problems, Process Scheduling

Memory Management : Memory Management without Swapping or Paging, Swapping, Virtual Memory, Page Replacement Algorithms, Modeling paging algorithms, Design issues for paging systems, Segmentation

File Systems And Input/Output : Files, Directories, File system implementation, Security, Protection mechanism, Principles of I/O Software, Disk Management

Deadlocks: Resources, Deadlocks, The O-----ptical Algorithm, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention, Other Issues

Case Study : Unix: Fundamental Concepts in Unix, MS – DOS: Fundamental Concepts in MS-DOS

Text Book: Modern Operating Systems by Andrew S. Tanenbaum

Reference: Applied Operating Systems Concepts by Avi Silberschatz, Peter Galvin, Grey Gagne

FE01 (FREE ELECTIVE) DATA STRUCTURES CREDITS: 4

Instruction: 3 Periods & 1 Tut/week **Sessional Marks: 30**
Univ. Exam: 3 Hours **Univ-Exam-Marks:70**

Introduction to Data Structures: Introduction, Data Information, Overview of Data Structures, Types of Data Structures, Primitive and Non-primitive Data Structures and operations, Binary and Decimal Integers, Logical Information, Storage Information, Hardware and Software, Concepts of Data Types, Data Types in c, Abstract Data Types, Pointers, Structures in C, Unions, Algorithms.
Recursion: Introduction to function, Types of Recursion, Rules for Recursive Function, Direct Recursion, Indirect Recursion, Recursion vs. Iterations, The Towers of Hanoi, Advantages and Disadvantages of Recursion, Tail Recursion, Recursion Efficiency .
Stack and Queues: Introduction, Stack-related terms, Stack Implementation, Operation on stacks, Pointers and stack, Introduction to Queues, various positions of Queues, Queue Implementation, Operation on Queues, Disadvantages of Simple Queues, Dynamic implementation (Pointers), Insertion and Deletion of Queues, Application of Queues.
Linked Lists: Introduction, Implementation of List, Traversal of List, Searching and Retrieving an Element, Predecessor and Successor, Insertion, Deletion. Sorting, Merging List, Linked List, Memory Allocation and De-allocation, Operations on Linked Lists, Single Linked List, Linked List with Header, Linked List without Header, Insertion in the Linked List, Insertion of Node at Start, Insertion of Node at End, Insertion of Node at Given Position, Reversing the Single Linked List, Concatenation of Two Lists, Splitting of Linked List, Circular Linked List, Method for Detecting and Double Linked List, Circular Double Linked List, Application of Linked List.
Trees: Introduction, Basic terms, Binary trees, Extended Binary tree, Binary trees Representation, Operation on Binary Tree, Traversal of Binary Tree, Binary Search tree.
Sorting: Introduction, Sorting and Insertion sort, Selection Sort, Bubble Sort, Quick Sort, Tree Sort, Merging List, Heap Sort, Radix Sort and Partition Exchange Sort.
Searching: Introduction, Searching, Linear (Sequential) Search, Binary Search, Hashing Method, Hashing Function, Division Method, Mid-Square Method, Folding Method, Length -Dependent Method, Multiplicative Hashing Function, Digit Analysis Method.
Graph: Introduction, Terminology, Graph Representation, Traversal in Graph (Breadth first and Depth searches), Spanning Trees, Prim' algorithm.

Textbooks:

Introduction to Data Structures in C by Ashok N. Kamthane, Pearson Education.

Reference Books:

1. Data Structures using C by Amiya Kumar Rath and Ashok Kumar Jagdev, SciTech Publications.
2. Data Structures Using C and C++ Yiddish Langsam, Moshe J. Augenstein and Aaron M. Tanenbaum, Prentice Hall Of India (2^{nd} Edition).

Note: All Implementation are Using C Language only.

CSE 3.1.7 OPERATING SYSTEMS LAB Credits:2

Lab: 3 periods/week Sessional Marks: 50
Univ_Exam: 3 hours. Univ_Exam marks: 50

1. Study of laboratory environment:
   Hardware specifications, software specifications
2. Simple Unix-C programs:
   Programs using system calls, library function calls to display and write strings on standard output device and files.
3. Programs using fork system calls.
2. Programs for error reporting using errno, perror( ) function.
3. Programs using pipes.
4. Shell programming.
5. Programs to simulate process scheduling like FCFS, Shortest Job First and Round Robin.
6. Programs to simulate page replacement algorithms like FIFO, Optimal and LRU.
7. Programs to simulate free space management.
8. Programs to simulate virtual memory.
10. Programs to simulate deadlock detection.

References:

Unix concepts and applications by Sumitabha Das, TMH Publications. Unix programming by Stevens, Pearson Education.
Shell programming by Yashwanth Kanetkar.
Operating System Concepts by Silberschatz, and Peter Galvin.

CSE 3.1.8 MICROPROCESSOR-II LAB Credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ-Exam : 3 Hours Univ-Exam-Marks: 50

INTERFACING WITH 8085 TRAINER

1.1 MEMORY INTERFACE (Interfacing SRAM and EPROM)
1.2 TOGGLE SWITCH KEYBOARD AND LED DISPLAY INTERFACE
1.3 HEX KEYBOARD AND DOT MATRIX HEX LED DISPLAY INTERFACE
1.4 ASCII KEYBOARD INTERFACE
1.5 PUSH BUTTON KEYBOARD MATRIX (8x3) INTERFACE WITH 8085 ICE
1.6 8279-PROGRAMMABLE KEYBOARD/DISPLAY INTERFACE
1.7 CRT TERMINAL INTERFACE

INTERFACING WITH PC

2.1 STEEPER MOTOR CONTROLLER
2.2 DAC/ADC INTERFACE
2.3 8253 TIMER INTERFACE
2.4 MULTIPLEXED DOT MATRIX HEX LEDs INTERFACE
2.5 40-COL./80COL. D.M. PRINTER INTERFACE
2.6 8051 PROGRAMMING EXERCISES
2.7 TRAFFIC LIGHT CONTROLLER INTERFACE

CSE 3.1.9 SOFTSKILLS LAB Credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ-Exam : 3 Hours Univ-Exam-Marks: 50

1) English Language Skills

2) Spoken English Skills

3) Presentation Skills

III/IV B.TECH.(CSE) II - SEMESTER

B.TECH. (CSE) 3rd YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 3.2.1	COMPILER DESIGN	3	1	--	70	30	100	4
CSE 3.2.2	DESIGN & ANALYSIS OF ALGORITHMS	3	1	--	70	30	100	4
CSE 3.2.3	DATA BASE MANAGEMENT SYSTEMS	3	1	--	70	30	100	4
CSE 3.2.4	DATA COMMUNICATIONS	3	1	--	70	30	100	4
CSE 3.2.5	ELECTIVE – II	3	1	--	70	30	100	4
CSE 3.2.6	COMPUTER ARCHITECTURE	3	1	--	70	30	100	4
CSE 3.2.7	**FILE STRUCTURES LAB.**	--	--	3	50	50	100	2
CSE 3.2.8	DBMS LAB.	--	--	3	50	50	100	2
							TOTAL CREDITS	28

ELECTIVE - II

[1]. PRINCIPLES OF PROGRAMMING LANGUAGE [2]. BIO-INFORMATICS [3]. IMAGE PROCESSING. [4]. VHDL

* The industrial training will be for three weeks during the summer after third year second semester.

CSE 3.2.1 COMPILER DESIGN Credits:4

Instruction: 3 Periods & 1 Week./Week Sessional Marks : 30
Univ_ Exam : 3 Hours Univ_ Exam Marks:70

The Theory of Automata: Definition and description, Transition systems, properties, Acceptability of string, NDFA, Equivalence in between DFA & NDFA. Grammars, Types of Grammars, Grammars and Automata, Regular expressions, Finite Automata and Regular expressions, Regular sets and Regular Grammars.

Overall view of Compilers: Brief discussion on various phases of Compilers.

Design of lexical analyzer.

Design of Parsers: Shift Reduce parser, Operator Precedence Parser, Predictive Parser, LR parser, SLR parser. LALR parser.

Syntax Directed Translation: Syntax directed translation and implementation, Intermediate code, Postfix notation, parsing tree, Three address Code, Quadruples, Triples.

Intermediate Code Optimization: The principle sources of optimization, Loop Optimization, DAG, Global data flow analysis.

Code Generation: Problems, Machine model, A simple code generator, Register allocation and assignment, Code generation from DAG, Peep hole optimization.

Brief discussion on symbol tables, Run-time storage administration.

chapters: 1,2,3,4,5,6,7,9,10,11,12,15 of the text book.

Text Book

Principles of Compiler Design by Aho, D. Ullman

Reference Books:

Compiler Construction by Kenneth. C. Louden, Vikas Pub. House.

CSE 3.2.2 DESIGN AND ANALYSIS OF ALGORITHMS Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:7**0**

Introduction – Fundamentals of algorithmic problem solving – important problem types – fundamental data structures.

Fundamentals of analysis of algorithms and efficiency – Analysis framework – Asymptotic Notations and Basic Efficiency classes – Mathematical Analysis of Non-recursive Algorithms – Mathematical Analysis of recursive Algorithms – Empirical Analysis of Algorithms – Algorithm Visualization
Brute Force – Selection Sort and Bubble sort – Sequential Search and Brute – Force String Matching – Closest Pair and Convex-Hull Problems by Brute Force – Exhaustive Search

Divide-and-Conquer – Mergesort – Quicksort – Binary Search – Binary Tree Traversals and Related Properties – Multiplication of large integers and Strassen's Matrix Multiplication – Closest- Pair Convex-Hull Problems by Divide- and – Conquer

Decrease – and – Conquer – Insertion Sort – Depth-First Search and Breadth-First Search- Topological Sorting – Algorithms for Generating Combinatorial Objects – Decrease-by-a- Constant-Factor Algorithms – Variable-Size-Decrease Algorithms

Transform-and-Conquer – Presorting – Gaussian Elimination – Balanced Search Trees – Heaps and Heapsort – Horner's Rule and Binary Exponentiation – Problem Reduction

Space and Time Tradeoffs – Sorting by Counting – Input Enhancement in string Matching – Hashing – B-Trees

Dynamic Programming – Computing a Binomial Coefficient – Warshall's and Floyd's Algorithm – Optimal Binary Search Trees - The Knapsack Problem and Memory Functions.

Greedy Technique – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman Trees Limitations of Algorithm Power – Lower-Bound Arguments – Decision Trees – P, NP and NP – complete problems – Challenges of Numerical Algorithms

Coping with the Limitations of Algorithms Power – Backtracking – Branch-and-Bound – Approximation Algorithms for NP-hard Problems – Algorithms for solving Nonlinear Equations.

Text Book:

Introduction to Design & Analysis of Algorithms by Anany Levitin, Pearson Education, New Delhi, 2003

Reference Books:

1. Introduction to Algorithms by Thomas H. Corman, Charles E. Leiserson, Ronald R. Rivest & Clifford Stein, Prentice Hall of India, New Delhi, New Delhi
2. The Design and Analysis of computer Algorithms, Aho, Hopcroft & Ullman, Pearson Education, New Delhi, 2003
3. Fundamentals of algorithmics, Gilles Brassard & Paul Bratley, Prentice Hall of India, New Delhi

CSE 3.2.3 DATABASE MANAGEMENT SYSTEMS Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Introduction to DBMS: Overview, File system vs DBMS, Advantages of DBMS, Storage data, queries, Transaction Management, DBMS structure

E-R model: Entities, Attributes and Entity sets, Relation ship and Relation ship sets, Features of ER model, Conceptual database design with ER model

Relational model: Integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views

Relational Languages: algebra and calculus

SQL: Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, ODBC and JDBC, Triggers and Active database, designing active databases

Schema refinement and normal forms : Schema refinement, fds, reasoning normal forms, normalization up to 3rd & BC normal forms, lossless join & dependency preserving decomposition

Transaction management: Transaction concept, transactions and schedules, concurrent execution of transactions, lock – based concurrency control, crash recovery

Concurrency control : Lock management, specialized locking techniques, concurrency control without locking

Crash Recovery: Aries, recovering from a system crash, media recovery

Text Book:
Database Management Systems by Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill

CSE 3.2.4 DATA COMMUNICATIONS Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

1. An Introduction to Data Communications:
A Communications Model, Data Communications and Data Communications Networking, Protocols and Protocol Architecture, Characteristics of Data Transmission: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments
2. Transmission Media:
Guided Transmission Media, Wireless Transmission Data Encoding, Digital Data, Digital Signals, Digital Data, Analog Signals, Analog Data, Digital Signals, Analog Data, Analog Signals
3. The Data Communication Interface
Asynchronous and Synchronous Transmission, Line Configurations, Interfacing.
Data Link Control Flow Control, Error Detection, Error Control, High-Level Data Link Control (HDLC),Other Data Link Control Protocols.
4. Data Communications Hardware: Terminals
Introduction, Basic Terminal Components, Enhanced Terminal Components, General-Purpose Terminals, Remote Job Entry Terminals, Transaction Terminals, Clustering of Terminal Devices. Communications Processing Hardware Introduction, Switching Processors, Multidrop Lines, Multiplexers, Concentrators, Front-End Processors.
5. Modems:
Network Attachment and Regulations, Line Conditioning and Leased Lines, Modems and Modem Circuits.
Multiplexing: Frequency-Division Multiplexing, Synchronous Time-Division Multiplexing: Characteristics, TDM Link Control, Digital Carrier Systems Statistical Time-Division Multiplexing: Characteristics.

TEXT BOOKS:

1. William Stallings, Data and Computer Communications, 7th Edition, Pearson Education Inc., 2004
2. Mary E.S. Loomis, Data Communications, PHI-N.J.,1983 (Capter 3, Chapter 5)
3. Paul Bates, Practical Digital and Data Communications, PHI-N.J, 1987(Chapter5)

REFERENCE BOOKS:

1.Behrouz A. Forouzan, Data Communications and Networking, 3rd EditionTMH, 2004
2.William A. Shay, Understanding Data Communications & Networks, 2nd Edition Thomson-Brooks/Cole - Vikas publishing House, 1999
3. Michale A. Miller, Data & Network Communications, Thomson/Delmar - Vikas Publishing House, 2000

CSE 3.2.5 ELECTIVE-II PRINCIPLES OF PROGRAMMING LANGUAGES Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

Language Design Issues: Why Study Programming Languages, A Short History of Programming Languages, Role of Programming Languages, Programming Environments
Impact of Machine Architectures: The Operation of a Computer, Virtual Computers and Binding Times
Language Translation Issues: Programming Language Syntax, Stages in Translation, Formal Translation Models, Recursive Descent Parsing.
Modeling Language Properties: Formal Properties of Languages, Language Semantics.
Elementary Data Types: Properties of Types and Objects, Scalar Data Types, Composite Data Types **Encapsulation**: Structured Data Types, Abstract Data Types, Encapsulation by Subprograms, Type Definitions.
Inheritance: Abstract Data Types Revisited, Inheritance, Polymorphism
Sequence Control: Implement and Explicit Sequence Control, Sequence with Arithmetic Expressions, Sequence Control Between Statements, Sequencing with Nonarithmatic Expressions.
Subprogram Control: Subprogram Sequence Control, Attributes of Data Control, Parameter Transmission, Explicit Common Environment.
Storage Management: Elements Requiring Storage, Programmer- and System - Controlled Storage, Static Storage Management, Heap Storage Management
Distributed Processing: Variations on Subprogram Control, Parallel Programming, Hardware Developments, Software Architecture.
Network Programming: Desktop Publishing, The World Wide Web

Text Book:

Programming languages – Design and Implementation by Terrence W. Pratt Marvin V. Zelkowitz. 3 rd Edition, Prentice Hall of India.

References:

1. Concepts of Programming Languages by Robert L. Sebesta, 4th Edition, Pearson Education.
2. Fundamentals of Programming Languages, Design & Implementation by Seyed H.Roosta. Vikas publications.
3. Programming Languages by Paradigm and Practice – Doris Appleby Julius J. Vendekopple Tata McGraw Hill Edition.

CSE 3.2.5 ELECTIVE-II BIOINFORMATICS Credits:4

Instruction: 3 Periods & 1 Tut /week Sessional Marks: 30
Univ. Exam : 3 Hours Univ-Exam-Marks:70

1. **Introduction:**
   Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition an prediction, Folding problem, Sequence Analysis, Homology and Analogy.
2. **Protein Information Resources**
   Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.
3. **Genome Information Resources**
   DNA sequence databases, specialized genomic resources
4. **DNA Sequence analysis**
   Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases
5. **Pair wise alignment techniques**
   Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.
6. **Multiple sequence alignment**
   Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching
7. **Secondary database searching**
   Importance and need of secondary database searches, secondary database structure and building a sequence search protocol
8. **Analysis packages**
   Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

Text Books:

1. Introduction to Bioinformatics, T K Attwood & D J Parry-Smith
Addison Wesley Longman
2. Bioinformatics- A Beginner's Guide, Jean-Michel Claveriw, Cerdric Notredame
WILEY dreamlech India Pvt. Ltd

Reference Books:

1. Introduction to Bioinformatics, Arthur M.Lesk, OXFORD publishers (Indian Edition)

CSE 3.2.5 ELCTIVE-II IMAGE PROCESSING Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Fundamentals of Image Processing
Image Acquisition, Image Model, Sampling, Quantization, Relationship between pixels, distance measures, connectivity , Image Geometry, Photographic film. Histogram: Definition, decision of contrast basing on histogram, operations basing on histograms like image stretching, image sliding, Image classification. Definition and Algorithm of Histogram equalization.
2. Image Transforms:-
A detail discussion on Fourier Transform, DFT,FFT, properties. A brief discussion on WALSH Transform , WFT, HADAMARD Transform, DCT.
3. Image Enhancement: (by SPATIAL Domain Methods)
a)Arithmetic and logical operations, pixel or point operations, size operations, b. Smoothing filters- Mean, Median, Mode filters – Comparative study, c.. Edge enhancement filters – Directorial filters, Sobel, Laplacian, Robert, KIRSCH, Homogeneity & DIFF Filters, prewitt filter, Contrast Based edge
enhancement techniques. Comparative study. d. Low Pass filters, High Pass filters, sharpening filters. – Comparative Study. e. Comparative study of all filters. f. Color image processing.
4. Image enhancement : (By FREQUENCY Domain Methods). Design of Low pass, High pass, EDGE Enhancement, smoothening filters in Frequency Domain. Butter worth filter, Homomorphic filters in Frequency Domain. Advantages of filters in frequency domain, comparative study of filters in frequency domain and spatial domain.
5. Image compression: Definition, A brief discussion on – Run length encoding, contour coding, Huffman code, compression due to change in domain, compression due to quantization, Compression at the time of image transmission. Brief discussion on:- Image Compression standards.
6. Image Segmentation: Definition, characteristics of segmentation. Detection of Discontinuities, Thresholding Pixel based segmentation method. Region based segmentation methods – segmentation by pixel aggregation, segmentation by sub region aggregation, histogram based segmentation, spilt and merge technique. Use of motion in segmentation (spatial domain technique only)
7. Morphology:-
Dilation, Erosion, Opening, closing, Hit-and-Miss transform, Boundary extraction,
Region filling, connected components, thinning, Thickening, skeletons , Pruning
Extensions to Gray – Scale Images Application of Morphology in I.P

Text Book:
Digital Image Processing , Rafael C. Gonzalez and Richard E. Woods, Addision Wesley
Reference books:
1. Fundamentals of Electronic Image Processing ,Arthur .R. Weeks, Jr. (PHI)
2. Image processing, Analysis, and Machine vision, Milan Sonka , Vaclav Hlavac, Roger Boyle, Vikas Publishing House.

CSE 3.2.5 ELECTIVE-II V H D L Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Overview of Digital Design with Vermilion HDL
2. Hierarchical Modeling Concepts
3. Basic Concepts
4. Modules and ports
5. Gate-Level Modeling
6. Dataflow Modeling
7. Behaviour Modeling
8. Tasks and Functions

Text Book:

1. Verilog HDL – A Guide to Digital Design and Synthesis, Samir Palnitkar, Pearson Education Pte. Ltd. (chapters: 1,2,3,4,5,6,7,8), 2001

Reference Books:

1. Fundamentals of Digital Logic with Verilog Design, Stephen Brown and Zvonko Vranesic, Tata - McgrawHill, 2002
2. A Verilog HDL Primer, J. Bhasker, Second Edition, Star galaxy Pub., 1999

CSE 3.2.6 COMPUTER ARCHITECTURE Credits:4

Instruction: 3 Periods & 1Tut/Week Sessional Marks: 30
Univ_Exam:3 Hours Univ_ Exam Marks:70

Computer Evolution, Computational Models The Concept of Computer Architecture Introduction to Parallel Processing Introduction to Instruction-Level Parallel Processors Pipelined Processors VLIW Architectures Superscalar Processors Processing of Control Transfer Instructions Code Scheduling of ILP-Processors Introduction to Data-Parallel Architectures Introduction to MIMD Architectures

Text Books:

1.Dezso Sima, Terence Fountain, Peter Kacsuk, Advanced Computer Architectures: A Design Space Approach, Pearson Education Inc., 1997.
2. J. L. Hennessy and D. A. Patterson, *Computer Architecture: A Quantitative Approach*, 3rd Edition, Morgan Kaufmann Publishing Co., 2002.

Reference Text

1. William Stalling, *Computer Organization & Architecture: Designing for Performance*, 6th Edition, PHI, 2003.
2. Kai Hwang, Advanced Computer Architecture: Parallelism, Scalability, Programmability, TMH, 2001

CSE 3.2.7 FILE STRUCTURES LAB Credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ-Exam : 3 Hours Univ-Exam-Marks: 50

1. File Operations:
Opening, reading, writing, closing and creating of files in C^{++}

2. Study of secondary storage devices:
Tracks, sectors, block capacity of disk, tape and CDROMs

3. File Structures in C^{++}
Reading a stream of fields, record structures and its length indicators, Mixing of numbers and characters, Use of a hex dump, Retrieving records by keys using sequential search, direct access

4. File performance
Data compression, storage compacting, reclaiming space dynamically

5. Indexing and indexed sequential files
Index file, inverted file operations, usage of B and B^{++} trees

6. Hashing files
Hashing functions, algorithms, record distribution and collision resolution by progressive over flow, Extendable hashing and hashing performance

CSE 3.2.8 DBMS LAB Credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ-Exam : 3 Hours Univ-Exam-Marks: 50

Study features of a commercial RDBMS package such as ORACLE/DB2, MS Access, MYSQL & Structured Query Language (SQL) used with the RDBMS.(Select two of RDMSs)

Laboratory exercises should include defining schemas for applications, creation of a database, writing SQL queries, to retrieve information from the database, use of host languages, interface with the embedded SQL, use of forms & report writing packages available with the chosen RDBMS product.

Some sample applications, which may be programmed, are given below: Accounting package for a shop,
Database manager for a Magazine agency or a newspaper agency, Ticket booking for performances,
Preparing greeting cards & birthday cards,
Personal accounts - Insurance, loans, mortgage payments, etc., Doctor's diary & billing system,
Personal bank account, Class marks management, Hostel accounting,
Video Tape library, History of cricket scores,
Cable TV transmission program manager, Personal library.

IV/IV B.TECH.(CSE) I - SEMESTER

B.TECH. (CSE) 4th YEAR I-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 4.1.1	OBJECT ORIENTED SOFTWARE ENGG.	3	1	--	70	30	100	4
CSE 4.1.2	COMPUTER NETWORKS	3	1	--	70	30	100	4
CSE 4.1.3	ARTIFICIAL INTELLIGENCE	3	1	--	70	30	100	4
CSE 4.1.4	MANAGEMENT PRINCIPLES	3	1	--	70	30	100	4
CSE 4.1.5	ELECTIVE-III	3	1	--	70	30	100	4
CSE 4.1.6	**WEB TECHNOLOGIES**	3	1	--	70	30	100	4
CSE 4.1.7	GRAPHICS & MULTIMEDIA LAB.	--	--	3	50	50	100	2
CSE 4.1.8	OBJECT ORIENTED SOFTWARE ENGG. LAB.	--	--	3	50	50	100	2
CSE 4.1.9	INDUSTRIAL TRAINING & SEMINAR*	-	-	-		100	100	2
						TOTAL CREDITS		30

ELECTIVE-III :

[1]. EMBEDDED SYSTEMS, [2]. NEURAL NETWORKS & FUZZY LOGIC [3]. RANDOM PROCESSES IN ENGINEERING.

* The industrial training will be for three weeks during the summer after third year second semester and assessment will be done in the 4th year first semester with a seminar on the training he/she got.

CSE 4.1.1 Object Oriented Software Engineering Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Software Engineering:
Software related problems, software engineering, concepts, development activities
2. Modeling: Modeling with UML
3. Project Communications:
Project communication, modes, mechanisms and activities
4. Requirements:
Requirements elicitation, concepts, activities & managing requirements elicitation
5. Analysis:
Analysis overview, concepts, activities and managing analysis
6. System Design:
Design overview, concepts, activities and managing system design
7. Object Design:
Object design overview, concepts, activities and managing object design
8. Rationale Management:
Rationale overview, concepts, activities and managing rationale
9. Testing;
Testing overview, concepts, activities and managing testing
10. Software Configuration Management:
Configuration Management overview, concepts, activities and managing configuration management
11. Project Management:
Project management overview, concepts, activities and managing project management models and activities.

Text Book:
Object-Oriented Software Engineering: Conquering Complex and Changing Systems
Bernd Bruegge and Allen H. Dutoit
Pearson Education Asia

Reference Book:
Object-Oriented Software Engineering: Practical software development using UML and Java
Timothy C. Lethbridge and Robert Laganiere
McGraw-Hill Higher education

CSE 4.1.2 COMPUTER NETWORKS Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Switched Networks, Circuit-Switching Networks, Circuit Switching Concepts, Soft switch Architecture, Packet Switching Principles, X.25, Frame Relay
Asynchronous Transfer Mode: Protocol Architecture, ATM Logical Connections, ATM Cells, ATM Service Categories, Routing in Switched Networks
Congestion Control in Switched Data Networks: Effects of Congestion, Congestion Control, Traffic management, Congestion Control in Packet Switched networks
Principles of Cellular Networks
Local Area Network Overview: Background, Topologies and transmission media, LAN Protocol Architecture, Bridges, Layer 2 and Layer 3 Switches
High Speed LANs: The Emergence of High Speed LANs, Ethernet
Wireless LANs: Overview, Wireless LAN Technology, IEEE802.11 Architecture and Services. **Internet Protocols**: Basic protocol Functions, Principles of Internetworking, Connectionless Internetworking, Internet Protocol
Internet Operation: Multicasting, Routing Protocols: Autonomous Systems & Approaches to Routing **Transport protocols**: Connection oriented Transport Protocol Mechanisms: Reliable Sequencing Network Service, TCP: TCP Services, TCP Header Format, TCP Mechanisms, UDP
Distributed Applications: Electronic Mail: SMTP, HTTP Overview, Network Management Systems, SNMPv1

Text Book: Data and Computer Communications, William Stallings 7th Edition, Pearson Education, 2004
Reference Books:

1. Data Communications and Networking, Behrouz A. Forouzan, 3rd Edition, TMH, 2004
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose and Keith W. Ross , 2nd Edition, Pearson Education, 2002
3. Computer Networks, Andrew S. Tanenbaum, 4th Edition, Pearson Education, 2003
4 An Engineering Approach to Computer Networking, S. Keshav, Pearson Education, 1997
5 Computer Networks and Internets with Internet Applications, Ddouglas e. Comer, 4th Edition, Pearson Education, 2003

CSE 4.1.3 ARTIFICIAL INTELLIGENCE Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Introduction to Artificial Intelligence, Artificial Intelligence Technique, Representation of a problem as State space search, production systems, Problem characteristics, Production System characteristics

Heuristic Search Technologies
Generate & Test Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means Endo Analysis

Predicate Logic
Proof with Backward Chaining, Resolution, question answering.

Representing Knowledge Using Rules:
Procedural Vs Declarative knowledge, Logic Programming, Forward Vs Backward Reasoning, Matching, Control Knowledge

Symbolic Reasoning with uncertainty
Non-monotonic Reasoning, Dependency – Directed Backtracking TMS.
Statistical Reasoning with Bayes Theorem, certainty Factors & Rule Based System, DS- Theory.

Weak & Strong Slot Filler Structures
Semantic nets, Frames, Conceptual dependencies, Scripts

Planning
Block world, Components of a Planning System, Goal State Planning, Non Linear Planning, Hierarchical Planning.

Natural Language Processing
Syntactic Analysis, Semantic Analysis, Discuses and Pragmatic Processing.

Expert Systems
Representing and Using Domain Knowledge, Expert Systems Shells, Explanation

Text Books:
1. Artificial Intelligence, Rich E & Knight K – Tata Mcgrahill (1991)
2. Introduction to Artificial Intelligence & Expert Systems, Paterson. PHI

CSE 4.1.4 MANAGEMENT PRINCIPLES Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:**70**

1. Nature and functions of management:
   Importance of management – definition of management – management process – Roles of manager – management _ a science or art – management _ a profession.
2. Planning:
   Nature of planning – Importance of planning – Types of planning – Steps on planning.
3. Decision – Making:
   Meaning of decision – Types of decisions.
4. Organization :
   Span of management – principles of organizing – departmentalization.
5. Authority Delegation and Decentralization :
   Source of formal authority – difference between authority and power – line and staff authority – delegation of authority – decentralization of authority.
6. Coordination:
   Need for coordination – Types of coordination – Techniques of coordination.
7. Direction:
   Requirements of effective direction – Motivation.
8. Importance of communication – Purposes of communication - Formal communication - Informal communication – Barriers to communication – Principles of effective Communication.
9. Leadership:
   Difference between a leader and a manager – Characteristics of leadership – Functions of a leader – Approaches to leadership – Effective leadership – Leadership style in Indian organizations.
10. Managerial control :
    Steps in a control process – Need for control – Types of control methods – Essentials of Effective control systems.
11. Social Responsibilities of Business :
    Meaning of social responsibility – social responsibilities of business towards different groups.

Text Book:

Principles of Management , PC Tripathi, PN Reddy, Second Edition, Tata McGraw-Hill.

CSE 4.1.5 ELECTIVE-III EMBEDDED SYSTEMS Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Introduction to embedded systems hardware needs; typical and advanced, timing diagrams, memories (RAM, ROM, EPROM). Tristate devices, Buses, DMA, UART and PLD's. Built-ins on the microprocessor.

Interrupts basics, ISR;Context saving, shared data problem. Atomic and critical section, Interrupt latency. Survey of software architectures, Round Robin , Function queue scheduling architecture, Use of real time operating system.

RTOS, Tasks , Scheduler, Shared data reentrancy, priority inversion, mutex binary semaphore and counting semaphore.

Inter task communication, message queue, mailboxes and pipes, timer functions, events. Interrupt routines in an RTOS environment.

Embedded system software design using an RTOS. Hard realtime and soft real time system principles, Task division, need of interrupt routines, shared data.

Embedded Software development tools. Host and target systems, cross compilers, linkers, locators for embedded systems. Getting embedded software in to the target system.

Debugging techniques. Testing on host machine, Instruction set emulators, logic analysers. In-circuit emulators and monitors.

Text Books:

1. David A. Simon, An Embedded Software Primer, Pearson Education, Inc., 1999
2. Sriram V Iyer and Pankaj Gupta, Embedded Real Time Systems programming, TMH, 2004

Reference Books:

1. Frank Vahid/ Tony Givargis, Embedded Systems Design – A Unified Hardware/Software Introduction, John Wiley & Sons, Inc., 2002
2. Raj Kamal, Embedded Systems, Architecture, Programming and Design, TMH, 2003

CSE 4.1.5 ELECTIVE-III NEUTRAL NETWORKS & FUZZY LOGIC Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Neural Networks and Fuzzy Systems
   Neural and Fuzzy Machine Intelligence, Fuzziness as Multivalence, The Dynamical-Systems Approach to Machine Intelligence, Intelligent Behavior as Adaptive Model- Free Estimation.
2. Neural Dynamics I: Activations and Signals
   Neurons as Functions, Signal Monotonicity, Biological Activations and Signals, Neuron Fields,Neuronal Dynamical Systems, Common Signal Functions, Pulse-Coded Signal Functions.
3. Neuronal Dynamics II: Activation Models
   Neuronal Dynamical Systems, Additive Neuronal Dynamics, Additive Neuronal Feedback, Additive Bivalent Models, BAM Connection Matrices, Additive Dynamic and the Noise-Saturation Dilemma, General Neuronal Activations: Cohen-Grossberg and Multiplicative Models.
4. Synaptic Dynamics I: Unsupervised Learning
   Learning as Encoding, Change, and Quantization, Four Unsupervised Learning Laws, Probability Spaces and Random Processes, Stochastic Unsupervised Learning and Stochastic Equilibrium, Signal Hebbian Learning, Competitive Learning, Differential Hebbian Learning, Differential Competitive Leering.
5. Synaptic Dynamics II: Supervised Learning
   Supervised Function Estimation, Supervised Learning as Operant Conditioning, Supervised Learning as Stochastic Pattern Learning with known Class Memberships, Supervised Learning as stochastic Approximation, The Back propagation Algorithm.
6. Fuzziness Versus Probability
   Fuzzy Sets and Systems, Fuzziness in a Probabilistic World, Randomness vs. Ambiguity: Whether vs. How much, The Universe as a Fuzzy Set, The Geometry of Fuzzy Set, The Geometry of Fuzzy Sets: Sets as Points. The Fuzzy Entropy Theorem, The Subsethood theorem. The Entropy-Subsethood Theorem.
7. Fuzzy Associative Memories
   Fuzzy Systems as Between-Cube Mappings, Fuzzy and Neural Function Estimators, Fuzzy Hebb FAMs, Adaptive FAMs: Product-Space Clustering in FAM Cells.

TEXT BOOK:
Neural Networks & Fuzzy Systems , Bark Kosko, PHI Published in 1994

REFERNCE BOOKS:
1. Fundamentals of Artificial Neural Networks, Mohamad H Hassoum. PHI
2. Neural network Design, Hagan, Demuth and Beale, Vikas Publishing House
3. Fuzzy Set Theory & its Application, .J. Zimmerman Allied Published Ltd.

CSE 4.1.5 ELECTIVE-III RANDOM PROCESSES IN ENGINEERING Credits:4

Instruction: 3 Periods & 1 Tut./week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1.STOCHASTIC PROCESSES:- Notion of Stochastic Process, Classification of Stochastic Process according to Time and State Space; Discrete time Morkovchains, n th step transition probabilities, stationery distribution of Morkovchains, Poisson process, Properties of Poisson; Birth and Death Process, Time dependent Birth and Death process, Renewal theory, Applications of elementary renewal theorem and key renewal theorem.

2. Stationary and Non Stationary processes:- AR Process; NA Process ; ARMA Process, ARIMA Process, Box and Jinkins Models, Correlogram analysis, Periodogram analysis, Spectrum of a Process.

3.QUEUEING THEORY:- Non Morkovchian queues, Phase type Technique, Embedded Markovchains Technique, GI/G/I Queues model, Polzak. Kintchins formula, queues with bulk arrivals queues with bulk services.

4. PRIORITY QUEUING MODELS:- Queues in Series, Queues in Parallel, Scheduling algorithms, Throughput analysis and waiting time distributions, Applications of Queuing theory in Communication Networks.

5.RELIABILITY ANALYSIS:- Concepts of Reliability, Failure Time distributions, Hazard rate functions, Reliability of a component, Bath- tub curve, System reliability, Series systems, parallel systems, Stand by redundancy, Availability , Maintainability, Fault tree constructions, Fault analysis.

REFERRENCES:

1. Probability, Statistics and Random Processes – By T.Veerarajan Tata McGraw – Hill

2. Probability and Statistics with Reliability , Queueing & Computer Science Applications – By Kishore S. Trivedi (Prentice Hall)

CSE 4.1.6 WEB TECHNOLOGIES Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

Java Script: - Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK, Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

Web Servers and Servlets: Tomcat web server, **Introduction** to Servelets: Lifecycle of a Serverlet, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

Database Access: Database Programming using JDBC, Studying Javax.sql.* package,Accessing a Database from Servlets & JSP Page , Application – Specific Database Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS:

1. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
2. Advanced Java™ 2 Platform How to Program, Deitel/Deitel/Santry
3. Java Server Pages –Hans Bergsten, SPD O'Reilly

REFERENCE:

1. HTML Black Book: The Programmer's Complete HTML Reference Book-by Steven Holzner
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 2: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson

CSE 4.1.7 Graphics & Multimedia Laboratory Credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ. Exam : 3 Hours Univ-Exam-Marks:50

Graphics: using any graphic package.

1. Drawing various types of lines and curves.
2. Creating various types text and fonts.
3. Creating two dimensional objects using the lines and curves
4. Animating the two dimensional pictures using transformations.
5. Coloring the pictures and Zooming.
6. Creating an object and applying animation of key framing.
7. Creating three dimensional objects using wire frame modeling.
8. Rotation, scaling and translating the 3 D objects.
9. Coloring the 3 D objects.
10. Shading the 3 D objects
11. Rendering the objects
12. Creating smooth surfaces.
13. Creating rugged surfaces based on fractal geometry.

Multimedia:

1 Preproduction & Presentation Graphics: Create a 7-10 slide presentation in your favorite presentation graphics application. (Power point is suggested; Corel Presentations 9 is free and is acceptable.)
2. Typefaces and Graphics: Create 1 vector and 1 bitmap graphic; they must be *your original work* created in any of the acceptable tools.
3. Desktop Publishing: Create a 2-page desktop-published "newsletter," possibly using your "What is Multimedia?" text. Include graphics.
4. Production Planning and Design: Create a proposal of project. Include summary, flowchart, element and resource lists.
5. User Interface Design & Graphics II: Create a user interface for your final project. Include 2 backgrounds and 1 button set. Aim for a cohesive look.
6. Multimedia Sound: Create 2 soundtracks and 2 EFX sounds for a previous project.
7. Digital Video: Use video capture to digitize your video shoot ro another video source to create short production (15-45 seconds)
8. Create three basic Web pages using Dreamweaver / flash or other authoring package or write bare HTML if you are able; pages must be linked and must include at least one graphic per page.

Books:

1) Prabhat K. Andleigh & Kiran Thakrar, " Mulitmedia Systems Design", Prentice Hall of India, New Delhi.
2) Calleen Coorough, "Multimedia and the Web Creating digital Excitement", Vikas Publishing House, New Delhi.
3) James E. Shuman, " Multimedia in Action", Vikas Publishing House, New Delhi.

CSE 4.1.8 OBJECT ORIENTED SOFTWARE ENGINEERING LAB credits:2

Lab: 3 Periods/week Sessional Marks: 50
Univ.-Exam : 3 Hours Univ-Exam-Marks:50

Computing Platform:
Each student group chooses its own platform, subject to approval by the instructor

Course Objectives:

1. They can design and implement complex software solutions using state of the art software engineering techniques.
2. The have working knowledge of UML, source control, and project management.
3. They have deep knowledge of the technologies they used for implementing their project.
4. They know how to test and document software.
5. They are capable of working as part of a software team and develop significant projects under a tight deadline.
6. They are able to present their work in a professional manner.

Topics to beCovered:

1. Software Engineering Process.
2. Unified Modeling Language (UML).
3. Data Structures and Specification.
4. Object-oriented design.
5. Debugging.

Syllabus Flexibility:
High. The students are free to chose a project based on the instructor's approval.

Assessment Methods:

1. Group meetings with faculty: initial proposal, code review, tracer-bullet implementation demo, final demo.
2. Design documents. Write-up.
3. Code documentation.
4. Presentations.

the students give their final presentations and demos.
Also, each project team meets individually with the instructor at least four times during the semester. The agenda for each of the four meeting is as follows:

1. Team presents project idea and has it approved by instructor. (first month)
2. design/code review. Instructor goes over design/code with the team to point out problems and formalize requirements. Instructor determines requirements for tracer-bullet implementation. (second month)
3. Tracer-bullet implementation demo. Team shows that it has achieved full vertical integration functionality. Instructor notices missed requirements and reminds students of requirements for final project.(beginning of third month).

Final meeting. Verify requirements, design, documentation, testing, write-up, division of labor, etc. (last month).

Sessional Marks Allotment: Monthly Meeting
Participation: 10% Monthly Progress Reports: 15%
Design/code Document: 15% Presentation: 10%
Prototype Demonstration: 10% Final Project
Demonstration: 30% Final Project Report: 10%

General Software Engineering Tips:
Be careful when making major modifications and keep backups! A good motto: There is no such thing as a safe software change.

One of the biggest mistakes that even professional software teams make is modifying code at the last minute.
Either resist the urge to make last minute changes, or keep them isolated and well-marked so that they can be backed out easily if necessary.
Test, test, test!!! You must test your system thoroughly after making any change, no matter how small. Else you will not know if a bug was introduced! You will get no sympathy if you break your system at the last minute.

Regression Testing:

A good habit to get into: frequently run your program on an extensive test set.

Once you have a prototype, create a set of examples that your program handles correctly. Generate files of the input and the correct output as a *test set*.

When you make significant changes, run your program on the test set. If the output is different, then you will know that you've introduced a bug. (Or if the output is improved, you should update the test set.)

Put together an extensive regression set! If it alerts you to one major bug (and it always does), then it is time well spent.

After verifying that a new change is "safe", save a version of your entire system! Never, EVER make changes to the saved version – it is a reliable version that you can recover in an emergency.

Documentation:

Get into the habit of documenting your code quickly as you go. If you think you'll remember why you did something, you are probably wrong.

Computer scientists typically hate to do documentation. One reason is that they leave it all for the end!

Get into the habit of writing small comments as you go. A few comments, explaining what's happening and why, can make a world of difference.

When you make a change, mark it with your initials, the date, a brief explanation, and an example. This will help enormously if the change needs to be removed or modified, and will prevent thrashing.

Working as a Team:

Be honest and realistic with your teammates when setting goals. If you fail to meet a promised deadline, it affects the whole team, not just you.

Communication is crucial! Don't make major decisions by yourself, and let people know when you are behind or ahead of schedule.

Try to exploit each other's strengths.

CSE 4.1.9 INDUSTRIAL TRAINING & SEMINAR credits:2

Univ-Exam : Internal Internal-Marks:100

The industrial training will be for three weeks during the summer after third year second semester and assessment will be done in the 4th year first semester with a seminar on the training he/she got

IV/IV B.TECH.(CSE) II – SEMESTER

B.TECH. (CSE) 4th YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH								
Sub. Ref. No.	Name of the Subject	Periods			Maximum Marks			Credits
		Theory	Tutorial	Lab.	Exam	Sessionals	Total	
CSE 4.2.1	DISTRIBUTED OPERATING SYSTEMS	3	1	--	70	30	100	4
CSE 4.2.2	CRYPTOGRAPHY AND NETWORK SECURITY	3	1	--	70	30	100	4
CSE 4.2.3	ELECTIVE-IV	3	1	--	70	30	100	4
FE02	**FREE ELECTIVE-II**	**3**	**1**	**--**	**70**	**30**	**100**	**4**
CSE 4.2.4	DATA COMMUNICATIONS & NETWORK PROGRAMMING LAB	--	--	3	50	50	100	2
CSE 4.2.5	PROJECT	--	--	3	50	50	100	8
							TOTAL CREDITS	26

ELECTIVE-IV:

[1]DATA WARE HOUSING & DATA MINING ,[2] SERVICE ORIENTED ARCHITECTURE

CSE 4.2.1 DISTRIBUTED OPERATING SYSTEMS Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Introduction to Distributed Systems, What is a Distributed System?, Hard ware concepts, Software concepts, Design issues.

Communication in Distributed Systems, Lay red Protocols, ATM networks, The Client – sever model, Remote Procedure call, Group communication.

Synchronization in Distributed System, Clock Synchronization, Mutual Exclusion, Election algorithms, Atomic transactions, Deadlocks in Distributed Systems.

Process and processors in Distributed System threads, System Models, Processors allocation, Scheduling in Distributed System, Fault tolerance, Real time Distributed System.

Distributed File Systems, Distributed File System Design, Distributed File System implementation, Trends in Distributed File System.

Distributed Shared Memory, Introduction, What is Shared memory?, Consistency models, Page based Distributed Shared memory, Shared – variable Distributed Shared memory, Object based Distributed Shared Memory.

TEXT BOOK**:**

Distributed Operating Systems, Andrew S. Tanenbanm

Reference Book**:**

Advanced Concepts in Operating Systems, Makes Singhal and Niranjan G.Shivaratna.

CSE 4.2.2 CRYPTOGRAPHY AND NETWORK SECURITY Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

INTRODUCTION: The need for security-security approaches-principles of security-Plain Text and Cipher Text-substitution and Transposition Techniques-Encryption and Decryption-Symmetric and Asymmetric Cryptography-Stenography-key range and key size-types of attacks
SYMMETRIC KEY CRYPTOGRAPHIC ALGORITHMS: Algorithm types and modes-overview of symmetric key cryptography-DES-IDEA-RC5-BLOWFISH-AES-Differential and Linear Cryptanalysis.

ASYMMETRIC KEY CRYPTOGRAPHIC ALGORITHMS: Overview of asymmetric key cryptography- RSA algorithm-symmetric and asymmetric key cryptography together-digital signatures-knapsack algorithm-some other algorithms.
PUBLIC KEY INFRASTRUCTURE: Introduction-Digital certificates- Private Key management-The PKIX model-Public Key Cryptography Standards- XML, PKI and Security

INTERNET SECURITY PROTOCOLS: Basic concepts-SSL-SHTTP-TSP-SET-SSL versus SET- 3D secure protocol-Electronic money-Email security-WAP security-security in GSM

USER AUTHENTICATION MECHANISMS: Introduction-Authentication basics-passwords- authentication tokens-certificate based authentication-biometrics authentication-kerberos-SSO approaches

PRACTICAL IMPLEMENTATIONS OF CRYPTOGRAPHY/SECURITY: Cryptographic solutions using Java-Cryptographic solutions using Microsoft-cryptographic toolkits-security and operating systems NETWORK SECURITY: Brief Introduction to TCP/IP- firewalls-IP security-Virtual Private Networks- case studies on cryptography and security.

TEXT BOOK:
Cryptography and Network security, Atul Kahate, Tata McGraw-Hill Pub company Ltd., New Delhi

REFERENCE BOOKS:

1) Network Security Private Communication in a public world, Charlie Kaufman, Radia Perlman & Mike Speciner, Prentice Hall of India Private Ltd., New Delhi
2) Network Security Essentials Applications and Standards, William Stallings, Pearson Education, New Delhi
3) Network Security: The Complete Reference by Roberta Bragg, Mark Phodes-Ousley, Keith Strassberg Tata Mcgraw-Hill

CSE 4.2.3 ELECTIVE-IV DATA WARE HOUSING AND DATA MINING Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. Introduction to Data Mining:
   Motivation and importance, What is Data Mining, Relational Databases, Data Warehouses, Transactional Databases, Advanced Database Systems and Advanced Database Applications, Data Mining Functionalities, Interestingness of a pattern Classification of Data Mining Systems, Major issues in Data Mining.
2. Data Warehouse and OLAP Technology for Data Mining
   What is a Data Warehouse? Multi-Dimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Development of Data Cube Technology, Data Warehousing to Data Mining
3 Data Preprocessing
   Why Pre-process the Data? Data Cleaning, Data Integration and Transformation
   Data Reduction, Discretization and Concept Hierarchy Generation
4 Data Mining Primitives, Languages and system Architectures,Data Mining Primitives: What defines a Data Mining Task?, A Data Mining query language, Designing Graphical Use Interfaces Based on a Data Mining Query language,Architectures of Data Mining Systems
5 Concept Description: Characterization and comparison ,What is Concept Description? Data Generalization and summarization-based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between different Classes, Mining Descriptive Statistical Measures in large Databases
6 Mining Association rule in large Databases, Association Rule Mining, Mining Single- Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining
7 Classification and prediction,Concepts and Issues regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back-propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods like k-Nearest Neighbor Classifiers, Case- Based Reasoning, Generic Algorithms, Rough Set Approach, Fuzzy Set Approaches, Prediction, Classifier Accuracy
8 Cluster Analysis
   What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods

Text Book:
Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufman Publications
Reference Books:
1. Introduction to Data Mining, Adriaan, Addison Wesley Publication
2. Data Mining Techniques, A.K.Pujari, University Press

CSE 4.2.3 (ELECTIVE-IV) SERVICE ORIENTED ARCHITECTURE Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

1. **INTRODUCTION TO SOA,EVOLUTION OF SOA**: Fundamental SOA; Common Characteristics of contemporary SOA; Benefits of SOA; A SOA timeline(from XML to Web Services to SOA); The continuing evolution of SOA (Standards organizations and Contributing vendors); The roots of SOA(comparing SOA to Past architectures).

2. **PRINCIPLES OF SERVICE – OREINTATION**: Services-orientation and the enterprise; Anatomy of a service-oriented architecture; Common Principles of Service-orientation; Service orientation and Object-orientation; Service layer abstraction; Business service layer; Orchestration service layer;

3. **WEB SERVICES AND SOA:** The Web services framework; Services (as Web Services); Service Registry; Service descriptions (with WSDL); Messaging (with SOAP), Transactions, Coordination, Business Activity, Orchestration, Choreography; Addressing, Reliable Messaging, Policies, Metadata, Security, Notification and Events; Semantic Web Services; RESTful Services;

4. **BUSINESS PROCESS DESIGN**: Business Process Management basics; WS-BPEL language basics; WS-Coordination overview; Service oriented business process design; WS-addressing language basics; WS-Reliable Messaging language basics; Service Component Architecture basics;

5. **ENTERPRISE PLATFORMS AND SOA**: SOA platform basics; Enterprise Service Bus basics (including basic and complex patterns); SOA support in J2EE; SOA support in .NET; SOA Reference Architecture;

Text Books:

1. **Service-Oriented Architecture Concepts and Technology and Design**-Thomas Erl, Pearson Education, 2005
2. **Understanding SOA with Web Services** – Eric Newcomer, Greg Lomow, Pearson Education, 2005
3. **Developing Enterprise Web Services** – An Architect's Guide – Sandeep Chatterjee, James Webber Pearson Education, ISBN 81-297-0491-9

References:

SUGGESTED READING: IT Architecture and Middleware, Strategies for Building Large Integrated Systems, Chris Britton, ISBN 0-201-70907-4

FE 02 (FREE ELECTIVE) INTERNET TECHNOLOGIES Credits:4

Instruction: 3 Periods & 1 Tut. /Week Sessional Marks: 30
Univ.-Exam : 3 Hours Univ-Exam-Marks:70

Introduction to internet - Internet history, IP address, DNS, e-mail.

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

Java Script: - Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK, Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

Web Servers and Servlets: Tomcat web server, **Introduction** to Servelets: Lifecycle of a Serverlet, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

Database Access: Database Programming using JDBC, Studying Javax.sql.* package,Accessing a Database from Servlets & JSP Page , Application – Specific Database Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS:

3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.

4. Advanced Java™ 2 Platform How to Program, Deitel/Deitel/Santry

3. Java Server Pages –Hans Bergsten, SPD O'Reilly

REFERENCE:

1. HTML Black Book: The Programmer's Complete HTML Reference Book-by Steven Holzner

2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 2: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson

CSE 4.2.4 DATA COMMUNICATIONS & NETWORK PROGRAMMING LAB Credits:2

Lab: 3 Periods /week Sessional Marks: 50

Univ.-Exam : 3 Hours Univ-Exam-Marks:50

FIRST CYCLE OF EXPERIMENTS

1.1 PC-to-PC COMMUNICATIONS UNDER **DOS** WITH **NULL MODEM**
a) Using Serial Ports and RS-232 C Cable Connection b) Using Paralell Ports and Parallel Cable Connection

1.2 PC-to-PC COMMUNICATIONS UNDER **DOS** WITH **MODEM** and **4-LINE EXCHANGE**
Using Communication Software: COMIT or XTALK

1.3 PC-to-PC COMMUNICATIONS UNDER **WIN 98's** DIRECT CABLE CONNECTION with NULL MODEM
a) Using Serial Ports and RS-232 C Cable Connection b) Using Paralell Ports and Parallel Cable Connection

1.4 PC-to-PC COMMUNICATIONS UNDER **WIN 98's DIAL-UP** NETWORKING WITH **MODEM** and **4-LINE EXCHANGE**

1.5 PC-to-PC COMMUNICATIONS UNDER **WIN 98's HYPER TERMINAL** WITH **MODEM** and **4-LINE EXCHANGE**

1.6 a) LAN WITH BUS TOPOLOGY with a minimum of two systems
i) Windows Peer-to-Peer Network ii) Windows NT Client-Server Network
b) LAN WITH STAR TOPOLOGY with a minimum of two systems

1.7 a) LAN WITH BUS TOPOLOGY with a minimum of two systems using NOVELL Netware
b) LAN WITH STAR TOPOLOGY with a minimum of two systems using NOVELL Netware

SECOND CYCLE OF EXPERIMENTS

2.1 **INERNET** CONNECTION SET-UP USING **DIAL-UP** NETWORKING

2.2 **TERMINAL NETWORK** WITH **UNIX/LINUX SERVER** and one or two Terminals

2.3 **TERMINAL NETWORK** WITH **UNIX/LINUX SERVER, Terminal Server,** and one or two terminals

2.4 NETWORK PROGRAMMING EXERCISE-I USING A SIMPLIFIED API
Echo software(Develop echo client and echo server programs and run the two programs on separate computers and verify that they can communicate Chat software (Develop chat client and chat server programs and test to ensure they can communicate). Build a simple file transfer service that consists of client and server

2.5 NETWORK PROGRAMMING EXERCISE -II USING THE SOCKET API

Write an echo client and server using sockets Build a web server using sockets

2.6 CONCURRENT NETWORK PROGRAMMING EXERCISE –III
Build a Concurrent server(threads) – Create a server capable of handling connections from multiple clients concurrently Build a Concurrent file transfer server(processes) – Create separate processes to allow a server to handle multiple clients concurrently

2.7 NETWORK PROGRAMMING EXERCISE –IV USING PROTOCOL DESIGN
Design a reliable data transfer protocol (Devise, implement and test a protocol that provides reliable data transfer across a network that drops, delays or corrupts packets
Design stop and wait flow control protocol Design a sliding window protocol

2.7.1 NETWORK PROGRAMMING EXERCISE –V WITH PROTOCOLS FROM TCP/IP SUITE Build a domain name system client program

CSE 4.2.5 PROJECT WORK Credits:8

Project: 6 Periods /week Sessional Marks: 50
Univ-Exam-Marks:50

GUIDELINES for preparing the report of the Project Work

FORMAT FOR PREPARATION OF PROJECT REPORT

FOR

B. TECH.(CSE)

1. ARRANGEMENT OF CONTENTS:

The sequence in which the project report material should be arranged and bound should be as follows:

1. Cover Page & Title Page
2. Bonafide Certificate
3. Abstract
4. Table of Contents
5. List of Tables
6. List of Figures
7. List of Symbols, Abbreviations and Nomenclature
8. Chapters
9. Appendices
10. References

The table and figures shall be introduced in the appropriate places.

2. PAGE DIMENSION AND BINDING SPECIFICATIONS:

The dimension of the project report should be in A4 size. The project report should be bound using flexible cover of the thick white art paper. The cover should be **printed in black letters** and the text for printing should be identical.

3. PREPARATION FORMAT:

3.1 Cover Page & Title Page – A specimen copy of the Cover page & Title page of the project report are given in **Appendix 1.**

3.2 Bonafide Certificate – The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 14, as per the format in **Appendix 2.**

The certificate shall carry the supervisor's signature and shall be followed by the supervisor's name, academic designation (not any other responsibilities of administrative nature), department and full address of the institution where the supervisor has guided the student. The term **'SUPERVISOR'** must be typed in capital letters between the supervisor's name and academic designation.

3.3 Abstract – Abstract should be one page synopsis of the project report typed double line spacing, Font Style Times New Roman and Font Size 14.

3.4 **Table of Contents –** The table of contents should list all material following it as well as any material which precedes it. The title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents but the page numbers of which are in lower case Roman letters. One and a half spacing should be adopted for typing the matter under this head. A specimen copy of the Table of Contents of the project report is given in **Appendix 3.**

3.5 **List of Tables –** The list should use exactly the same captions as they appear above the tables in the text. One and a half spacing should be adopted for typing the matter under this head.

3.6 **List of Figures –** The list should use exactly the same captions as they appear below the figures in the text. One and a half spacing should be adopted for typing the matter under this head.

3.7 **List of Symbols, Abbreviations and Nomenclature** – One and a half spacing should be adopted or typing the matter under this head. Standard symbols, abbreviations etc. should be used.

3.8 **Chapters** – The chapters may be broadly divided into 3 parts (i) Introductory chapter, (ii) Chapters developing the main theme of the project work (iii) and Conclusion.

The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

- Each chapter should be given an appropriate title.
- Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.
- Footnotes should be used sparingly. They should be typed single space and placed directly underneath in the very same page, which refers to the material they annotate.

3.9 **Appendices** – Appendices are provided to give supplementary information, which is included in the main text may serve as a distraction and cloud the central theme.

- Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc.
- Appendices, Tables and References appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.
- Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

3.10 List of References –The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing left – justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

A typical illustrative list given below relates to the citation example quoted above.

REFERENCES

1. Ariponnammal, S. and Natarajan, S. (1994) 'Transport Phonomena of Sm Sel – X Asx', Pramana – Journal of Physics Vol.42, No.1, pp.421-425.

2. Barnard, R.W. and Kellogg, C. (1980) 'Applications of Convolution Operators to Problems in Univalent Function Theory', Michigan Mach, J., Vol.27, pp.81–94.

3. Shin, K.G. and Mckay, N.D. (1984) 'Open Loop Minimum Time Control of Mechanical Manipulations and its Applications', Proc.Amer.Contr.Conf., San Diego, CA, pp. 1231-1236.

3.10.1 Table and figures - By the word Table, is meant tabulated numerical data in the body of the project report as well as in the appendices. All other non-verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

4. TYPING INSTRUCTIONS:

The impression on the typed copies should be black in colour.

One and a half spacing should be used for typing the general text. The general text shall be typed in the Font style 'Times New Roman' and Font size 14.

*** * * * ***

(A typical Specimen of Cover Page & Title Page)
<Font Style Times New Roman – Bold>

TITLE OF PROJECT REPORT

<Font Size 18><1.5 line spacing>

A PROJECT REPORT

<Font Size 14>

Submitted by

<Font Size 14><Italic>

NAME OF THE CANDIDATE(S)

<Font Size 16>

in partial fulfillment for the award of the degree

of

<Font Size 14><1.5 line spacing><Italic>

BACHELOR OF TECHNOLOGY

<Font Size 16>

IN

COMPUTER SCIENCE AND ENGINEERING

<Font Size 14>

DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING

<Font Size 12>

ANDHRA UNIVERSITY AUTONOMOUS COLLEGE OF ENGINEERING

< Font Size 14>

ANDHRA UNIVERSITY : VISAKHAPATNAM - 530003

<Font Size 16><1.5 line spacing>

MONTH & YEAR

<Font Size 14>

SPECIMEN

SOME PERFORMANCE ASPECTS CONSIDERATIONS OF A CLASS OF ARTIFICIAL NEURAL NETWORK

A PROJECT REPORT

Submitted by

SANDHY. A

GAYATHRI. R

in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING

ANDHRA UNIVERSITY AUTONOMOUS COLLEGE OF ENGINEERING

ANDHRA UNIVERSITY:: VISAKHAPATNAM-530 003

MAY 2005

(A typical specimen of Bonafide Certificate)
<Font Style Times New Roman>

ANDHRA UNIVERSITY : VISAKHAPATNAM-530 003

<Font Style Times New Roman – size -18>

BONAFIDE CERTIFICATE

<Font Style Times New Roman – size -16>

<Font Style Times New Roman – size -14>

Certified that this project report **"…….TITLE OF THE PROJECT……..."** is the bonafide work of "**……..NAME OF THE CANDIDATE(S).……"** who carried out the project work under my supervision.

<<Signature of the Head of the Department>>
SIGNATURE

<<Name>>
HEAD OF THE DEPARTMENT

<<Department>>

<<Full address of the Dept & College >>

<<Signature of the Supervisor>>
SIGNATURE

<<Name>>
SUPERVISOR

<<Academic Designation>>

<<Department>>

<<Full address of the Dept & College >>

(A typical specimen of table of contents)
<Font Style Times New Roman>

TABLE OF CONTENTS