4-Years B.TECH
COMPUTER SCIENCE AND 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
COMPUTER SCIENCE AND ENGINEERING

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

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## 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

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

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### 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**

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**TOTAL CREDITS** 33

**ELECTIVE-I**

1. COMPUTER GRAPHICS
2. DIGITAL SIGNAL PROCESSING
3. FAULT TOLERANT COMPUTING
4. COMBINATORICS & GRAPH 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**

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**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

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**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

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**TOTAL CREDITS** 26

**ELECTIVE-IV:**

[1] DATA WARE HOUSING & DATA MINING  
[2] SERVICE ORIENTED ARCHITECTURE
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CSE2.1.1         ELECTRONICS         Credits: 4

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

I. **Semiconductors:**

II. **PNJunctionDiode:**
   PN Junction Diode, VI Characteristics of PN Junction Diode, capacitance effects in PN Junction Diode, Quantitative theory of PN Junction Diode.

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

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

V. **TransistorBiasingandthermalstabilization:**
   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, Smallequivalent 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:**

**TEXT BOOK:**
   Electronic Device and Circuits by Sanjeev Guptha

**REFERENCE:**
   Integrated Electronics by Millman & Halkias.
Magnetic circuits: Definitions of magnetic circuit, Reluctance, Magneto-motive force, magnetic flux, Simple problems on magnetic circuits, Hysterisis loss.


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.


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


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: 3Periods & 1Tut/week

Univ. Exam: 3Hours

Sessional Marks: 30

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


**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


**Linked Representation of Graphs:** Dijijkstra’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:**


**Note:** All Implementation are Using C Language only.
**CSE 2.1.4**  
**DISCRETE MATHEMATICAL STRUCTURES-I**  
Credits: 4

Instruction: 3 Periods & 1Tut/week  
Univ. Exam: 3 Hours

**Sessional Marks:** 30  
**Univ-Exam-Marks:** 70


**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 – sub graphs - 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 a strees – height balanced trees.

**Text Book:**

**Reference Books:**
2) “Discrete mathematics” by Richard Johnson baug, Pearson Education, New Delhi
CSE 2.1.5  PROBABILITY, STATISTICS & QUEUING THEORY  Credits: 4

Instruction: 3Periods & 1Tut/week  Sessional Marks: 30
Univ.Exam:3Hours  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 Randomvariable, 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 properties.

Curve fitting using Principle of Least Squares.

Multivariate Analysis: Correlation, correlationcoefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association,$\chi^2$ – 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.


Large Sample tests: Tests based on normal distribution

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

Text Book:

Reference Book:
Probability & Statistics with Reliability, Queuing and Computer Applications by Kishor S.Trivedi, Prentice Hall of India, 1999

2. Combinational Logic Design, Gate-Level Minimization.
   Combinational Logic

3. Sequential Logic Design, Synchronous Sequential Logic
   Registers and Counters.
   Fundamentals of Asynchronous Sequential Logic

4. Memory and Programmable Logic

TEXTBOOK:

REFERENCEBOOKS:
2. Fundamentals of Digital Circuits, A. Ananda Kumar, PHI, 2002
1. Familiarization of electronics component and equipment’s 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.
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.
## B.TECH. (CSE) 2nd YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION

**WITH EFFECT FROM 2010-11 ADMITTED BATCH**

<table>
<thead>
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<th>Maximum Marks</th>
<th>Credits</th>
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<td>OPERATIONS RESEARCH</td>
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<td>CSE 2.2.9</td>
<td>HUMAN VALUES &amp; PROFESSIONAL ETHICS</td>
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</table>

**TOTAL CREDITS** 28
Overview of operations Research: OR models – OR Techniques


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

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


Books:

1. Introduction to Operations Research by HILLIER/ LIEBMAN, Tata McGraw Hill
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 asset - 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 - Sub lattices - Direct Product and Homomorphism’s – Isomorphism’s – Modular Lattices-Distributive lattices- Complimented lattices – Their Properties

Boolean Algebra: Definition – Sub algebra - Direct Product - Homomorphism’s – Isomorphism’s - Boolean Functions – Representation of Boolean Functions – Minimization of Boolean Functions - Design examples of Boolean Algebra


Text Book:

Reference Books:
1) Discrete and combinatorial mathematics by Ralph G. Grimaldi Pearson Education, New Delhi
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 8085µP:
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 8086µP:
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

TEXTBOOKS:

REFERENCE BOOK:
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:

Reference Book:
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 Over loading & 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. **Introduction 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. JAVA2.0-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 Mc-graw Hill.)
Module 1: Introduction
Definition, Score and importance, Measuring and defining environmental development: Indicators

Module 2: Ecosystems
Introduction, Types, Characteristic features, Structure and functions of ecosystems, Forest, Grassland, Desert, Aquatic (lakes, rivers and estuaries).

Module 3: Environment and Natural Resources Management
Land Resources : Land as a resource, Common property resources, land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer-pesticide problems, 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, Droughts, Water logging and salinity, Dams – benefits and costs, Conflicts over water, Energy Resources : Energy needs, Renewable and non-renewable energy sources, Use of alternate energy resources, Impact of energy use on environment.

Module 4: Bio-Diversity and its Conservation
Value of bio-diversity – Consumptive and productive use, Social, Ethical, Aesthetic and option values, Biogeographical classification of India – India as a mega diversity habitat, Threats to biodiversity – Hot-sports, habitat loss, poaching of wildlife, loss of species, seeds etc., Conservation of biodiversity – in – situ and ex-situ conservation.

Module 5: Environmental Pollution – Local and Global Issues
Causes, 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 re-use, Nature of thermal pollution and nuclear hazards, Global warming, Acid rain, Ozone depletion.

Module 6: Environmental Problems in India
Drinking water, Sanitation and public health, Effect of activities of the quality of environment: Urbanization, Transportation, Industrialization, Green revolution, Water scarcity and ground water depletion, Controversies on major dams – Resettlement and rehabilitation of people problems and concerns, Rain water harvesting, Cloud seeding and watershed management.

Module 7: Economy and Environment
The economy and environment interaction, Economics of development, Preservation and conservation, Sustainability: Theory and practice, Limits to growth, Equitable use of resources for sustainable lifestyles, Environmental impact assessment.

Module 8: Social Issues and the Environment
Population growth and environment, Environmental education, Environmental movements, Environment Vs development.

Module 9: Institutions and Governance
Regulation by Government, Monitoring and enforcement of environmental regulation, Environmental acts: Water (Prevention and control of pollution) act, air (Prevention and control of pollution) act, Environmental Protection Act, Wild life protection act, Forest conservation act, Costal zone regulations, Institutions and policies relating to India, Environmental Governance.
Module 10: International Conventions

Module 11: Case Studies
Chipko movement, Narmada bachao andolan, Silent valley project, Madhura refinery and Taj Majal, Industrialization of pattancheru, Nuclear reactor at Nagarjuna Sager, Tehri Dam, Ralegaon Siddhi (Anna Hazare), Kolleru lake – Aquaculture, Florosis in Andhra Pradesh.

Module 12: Field Work
Visit to a local area to document and mapping environmental assets – River / forest / grassland / hill / mountain, Study of local environment – Common plants, Insects, Birds, Study of simple ecosystems – Pond, river, hill, slopes etc. Visits to industries, Water treatment plants, Affluent treatment plants.

Textbooks: Kaushik – Kaushik, Anubha

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. ALU

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 8085µPTrainer with Terminal
   - 8085 Line Assembler of 8085µPTrainer 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.
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 Array Index out of Bounds Exception 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.
8. Program for Banner Applet.
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.
CSE2.2.9 Human Values & Professional Ethics Credits: 2
Instruction: 2 Periods

UNIT-I: Ethical Theories
- Basic Moral Theories:
  i) Beneficence: doing good to others
  ii) Non-violence or peace
  iii) Justice

UNIT-II
- Classification of Ethical Theories:
  i) Consequentialism–Mill’s utilitarianism—greatest happiness to greatest number of people.
  ii) Deontology—Kantianism—Actions must satisfy the categorical imperative.
  iii) Virtue theory—Aristotelianism virtue is a mean between two extremes of action or passion.

UNIT-III
- Rights & Responsibilities of a citizen:
  i) Fundamental duties as stipulated in the constitution of India.
  ii) The rights to individuals guaranteed by Indian constitution.
  iii) (a) Rights of a professional
       (b) Professional responsibilities.

UNIT-IV
- Human Values & Attitudes:
  i) Classification of Values
  ii) Analysis of desirable values
  iii) The importance of attitudes in personal & Professional lives.

UNIT-V
- Ethical Living:
  i) Maslow’s theory of Hierarchy of needs.
  ii) Clayton Alderfer’s ERG (Existence, Relatedness and Growth) theory.
  iii) Concept of harmony in life.

### 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**

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**Total Credits** 33

**ELECTIVE-I**

1. COMPUTER GRAPHICS
2. DIGITAL SIGNAL PROCESSING
3. FAULT TOLERANT COMPUTING
4. COMBINATORICS & GRAPH THEORY.
CSE 3.1.1  MICROPROCESSORS - II  Credits: 4

Instruction: 3Periods & 1Tut/Week  
Univ. Exam: 3Hours  
Sessional Marks: 30  
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 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, ROMBIOS and BIOS Function Calls, DOS Function Calls, Introduction to Pentium Processors

TEXT BOOKS:

REFERENCE BOOKS:
5. Myke Predko, Programming and Customizing the 8051 Microcontroller, TMH, 1999
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.

**Text Book:** Systems Programming by Donovan Tata McGraw Hill

**Reference:** System Programming by Dhamdhere Tata McGraw Hill, IIInd Revised Edition
CSE 3.1.3 ELECTIVE-I (1) COMPUTER GRAPHICS Credits: 4

Instruction: 3Periods & 1Tut/Week
Univ.Exam:3Hours

Univ.
Exam Marks: 70


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 Viewing: The viewing Pipeline - Viewing Coordinate Reference Frame – Window – to – View port 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 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


Reference Books:

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:

Reference Books:
CSE 3.1.3  ELECTIVE-I (3) FAULT TOLERANT COMPUTING  Credits: 4

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

Basic Concepts of Reliability
Faults in Digital Circuits
Test Generation


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:
PART I: COMBINATORICS


PART II: GRAPH THEORY


TEXTBOOKS:


2. Douglas B. West, “Introduction to Graph Theory”, Pearson Education Asia, New Delhi (Chapters 1, 2, 3, 4, 5, 6, 7)

REFERENCE BOOKS:


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  
Univ. Exam: 3Hours  

Sessional Marks: 30  
Univ. Exam Marks: 70

1. Finite Automata and Regular Expressions:  

2. Regular sets & Regular Grammars:  

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 properties 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.

TEXTBOOKS:  

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.
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 over head, 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 bottle necks

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, and internal structure of index set blocks: a variable B*treder 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: 3Periods & 1Week/Week
Univ. Exam: 3Hours

Sessional Marks: 30
Univ. Exam Marks: 70

**Introduction:** What ISOS; 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 Optical 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 AviSilberschatz, Peter Galvin, Grey Gagne
FE01  (FREE ELECTIVE)  DATA STRUCTURES  CREDITS: 4

Instruction: 3Periods & 1 Tut/week  Sessional Marks: 30
Univ. Exam: 3Hours  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, Advantages of Simple Queues, Dynamic implementation (Pointers), Insertion and Deletion of Queues, Application of Queues.


**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:**


**Note:** All Implementation are Using C Language only.
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.
CSE3.1.8  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 Leddis Play 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. /80 COL. D.M. Printer Interface
2.6 8051 Programming Exercises
2.7 Traffic Light Controller Interface
CSE 3.1.9  SOFT SKILLS LAB  Credits: 2

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

Communication:
Importance of communication
Non verbal communication
Personal appearance
Posture
Gestures
Facial expressions
Eye contact
Space distancing

Goal setting:
Immediate, short term, long term,
Smart goals, strategies to achieve goals

Time management:
Types of time
Identifying time wasters
Time management skills

Leadership and team management:
Qualities of a good leader
Leadership styles
Decision making
Problem solving
Negotiation skills

Group discussions:
Purpose (Intellectual ability, creativity, approach to a problem, solving, tolerance, qualities of a leader)
Group behaviour, Analysing performance

Job interviews:
Identifying job openings
Preparing resumes & CV
Covering letter
Interview (Opening, body-answer Q, close-ask Q),
Types of questions

Reference books:
1. ‘Effective Technical Communications’ by Rizvi M. Ashraf, McGraw–Hill Publication
2. ‘Developing Communication Skills’ by Mohan Krishna & Meera Banerji, Macmillan
3. ‘Creative English for Communication’ by N.Krishnaswami & T. Sriraman, Macmillan
### 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**

<table>
<thead>
<tr>
<th>Sub. Ref. No.</th>
<th>Name of the Subject</th>
<th>Periods</th>
<th>Maximum Marks</th>
<th>Credits</th>
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<tr>
<td>CSE 3.2.1</td>
<td>COMPILER DESIGN</td>
<td>3</td>
<td>70</td>
<td>4</td>
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<tr>
<td>CSE 3.2.2</td>
<td>DESIGN &amp; ANALYSIS OF ALGORITHMS</td>
<td>3</td>
<td>70</td>
<td>4</td>
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<tr>
<td>CSE 3.2.3</td>
<td>DATA BASE MANAGEMENT SYSTEMS</td>
<td>3</td>
<td>70</td>
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<td>CSE 3.2.4</td>
<td>DATA COMMUNICATIONS</td>
<td>3</td>
<td>70</td>
<td>4</td>
</tr>
<tr>
<td>CSE 3.2.5</td>
<td>ELECTIVE – II</td>
<td>3</td>
<td>70</td>
<td>4</td>
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<tr>
<td>CSE 3.2.6</td>
<td>COMPUTER ARCHITECTURE</td>
<td>3</td>
<td>70</td>
<td>4</td>
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<tr>
<td>CSE 3.2.7</td>
<td><strong>FILE STRUCTURES LAB.</strong></td>
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<td>50</td>
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<tr>
<td>CSE 3.2.8</td>
<td><strong>DBMS LAB.</strong></td>
<td>--</td>
<td>50</td>
<td>2</td>
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</tbody>
</table>

**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.
The Theory of Automata: Definition and description, Transition systems, properties, Acceptability of string, N DFA, 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.


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

Chapters: 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 15 of the textbook.

Text Book
Principles of Compiler Design by Aho, D. Ullman

Reference Books:


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


Text Book:

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

Reference Books:


3. Fundamentals of algorithmics, Gilles Brassard & Paul Bratley, Prentice Hall of India, New Delhi
CSE3.2.3 DATABASE MANAGEMENT SYSTEMS Credits: 4

Instruction: 3 Periods & 1Tut/week
Univ. Exam: 3 Hours

Sessional Marks: 30
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, Relationship and Relationship 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 Rama krishnan and Johannes Gehrke, McGraw-Hill
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:**

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**

5. **Modems:**

**TEXTBOOKS:**
1. Mary E.S. Loomis, Data Communications, PHI-N.J. 1983 (Chapter 3, Chapter 5)
2. Paul Bates, Practical Digital and Data Communications, PHI-N.J. 1987 (Chapter 5)

**REFERENCEBOOKS:**
1. Behrouz A. Forouzan, Data Communications and Networking, 3rd Edition TMH, 2004
CSE 3.2.5  ELECTIVE-II (1) PRINCIPLES OF PROGRAMMING LANGUAGES  Credits: 4

Instruction: 3 Periods & 1Tut/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 Non-arithmetic 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 Sub program Control, Parallel Programming, Hardware Developments, Software Architecture

**Network Programming:** Desktop Publishing, The World Wide Web

**Text Book:**

**References:**
1. **Introduction:**
   - Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition and 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 sequences each 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

**Reference Books:**
1. Introduction to Bioinformatics, Arthur M. Lesk, OXFORD publishers (Indian Edition)
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, etc. Edge enhancement filters – Directorial filters, Sobel, Laplacian, Robert, KIRSCH, Homogeneity & DIFF Filters, prewittfilter, Contrast Base 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.
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)
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:

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:

Reference Text
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 overflow,
   Extendable hashing and hashing performance
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.
### B.TECH. (CSE) 4th YEAR 1-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION WITH EFFECT FROM 2010-11 ADMITTED BATCH

<table>
<thead>
<tr>
<th>Sub. Ref. No.</th>
<th>Name of the Subject</th>
<th>Periods</th>
<th>Maximum Marks</th>
<th>Credits</th>
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<tr>
<td>CSE 4.1.1</td>
<td>OBJECT ORIENTED SOFTWARE ENGG.</td>
<td>3 1 --</td>
<td>70 30 100</td>
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<td>COMPUTER NETWORKS</td>
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<td>70 30 100</td>
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<td>CSE 4.1.3</td>
<td>ARTIFICIAL INTELLIGENCE</td>
<td>3 1 --</td>
<td>70 30 100</td>
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<tr>
<td>CSE 4.1.4</td>
<td>PRINCIPLES OF ECONOMICS &amp; MANAGEMENT</td>
<td>3 1 --</td>
<td>70 30 100</td>
<td>4</td>
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<tr>
<td>CSE 4.1.5</td>
<td>ELECTIVE-III</td>
<td>3 1 --</td>
<td>70 30 100</td>
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<td>CSE 4.1.6</td>
<td>WEB TECHNOLOGIES</td>
<td>3 1 --</td>
<td>70 30 100</td>
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<tr>
<td>CSE 4.1.7</td>
<td>GRAPHICS &amp;MULTIMEDIA LAB.</td>
<td>-- -- 3</td>
<td>50 50 100</td>
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<tr>
<td>CSE 4.1.8</td>
<td>OBJECT ORIENTED SOFTWARE ENGG. LAB.</td>
<td>-- -- 3</td>
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<tr>
<td>CSE 4.1.9</td>
<td>INDUSTRIAL TRAINING &amp; SEMINAR*</td>
<td>-- -- -</td>
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**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

Instruction: 3 Periods & 1Tut./Week  Sessional Marks: 30
Univ. Exam: 3Hours  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
7. 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
8. 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:
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
Internet Protocols: Basic protocol Functions, Principles of Internetworking, Connectionless Internetworking, Internet Protocol
Internet Operation: Multicasting, Routing Protocols: Autonomous Systems & Approaches to Routing
Distributed Applications: Electronic Mail: SMTP, HTTP Overview, Network Management Systems, SNMPv1


Reference Books:
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 Back tracking 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, Discusses and Pragmatic Processing.

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

Text Books:
2. Introduction to Artificial Intelligence & Expert Systems, Paterson. PHI

2. **Conditions of different Market Structures** - Perfect Competition, Monopolistic Competition, Monopoly, Oligopoly and Duopoly.

3. **Forms of Business Management** - Sole Proprietorship, Partnership, Joint Stock Company- Private limited and public limited companies, Public enterprises and their types.


5. **Production Management** - Production Planning and Control, Plant Location, Break-Even Analysis, assumptions and applications.


7. **Entrepreneurship** - Entrepreneurial Functions, Entrepreneurial Development: Objectives, Training, Benefits; Phases of Installing a Project.

**Text Books:**

**References:**
CSE 4.1.5  ELEETIVE-III (1) EMBEDDED SYSTEMS  Credits: 4

Instruction: 3 Periods&1Tut/Week  
Univ.-Exam: 3 Hours

Sessional Marks: 30  
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.


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

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

Embedded system software design using an RTOS. Hard real time 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 into the target system.

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

Text Books:

2. Sriram V Iyer and Pankaj Gupta, Embedded Real Time Systems programming, TMH, 2004

Reference Books:

CSE 4.1.5 ELECTIVE-III (2) NEUTRAL NETWORKS & FUZZY LOGIC Credits: 4

Instruction: 3Periods & 1Tut/Week  
Univ. Exam: 3Hours  

Sessional Marks: 30  
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 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  

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

REFERENCE BOOKS:  
1. Fundamentals of Artificial Neural Networks, Mohamad H Hassoum. PHI  
3. Fuzzy Set Theory & its Application, J. Zimmerman Allied Published Ltd.
CSE 4.15 ELECTIVE-III (3) RANDOM PROCESSES IN ENGINEERING Credits: 4

Instruction: 3 Periods & 1Tut/week
Univ. Exam: 3 Hours

Sessional Marks: 30
Univ. Exam Marks: 70


3. QUEUEING THEORY: Non Markov chain queues, Phase type Technique, Embedded Markov chains Technique, GI/G/1 Queues model, Polzak. Kintchins formula, queues with bulk arrival queues with bulk services.

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


REFERENCES:

2. Probability and Statistics with Reliability, Queuing & Computer Science Applications – By Kishore S. Trivedi (Prentice Hall)
HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets;

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


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


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


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 AND JAVASERVER PAGES VOLUME 2: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson

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 3D objects.
9. Coloring the 3D objects.
10. Shading the 3D objects.
11. Rendering the objects.
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. Type faces and Graphics: Create 1 vector and 1 bitmap graphic; they must be your original work created in any of the acceptable tools.
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 sound tracks and 2 EFX sounds for a previous project.
7. Digital Video: Use video capture to digitize your video shoot to another video source to create short production (15-45seconds)
8. Create three basic Web pages using Dream weaver /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:

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. They 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 be covered:
4. Object-oriented design.
5. Debugging.

Syllabus Flexibility:
High. The students are free to choose 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.
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).

Session 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 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 team mates when setting goals. If you fail to meet a promised dead line, 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.
### B.TECH. (CSE) 4th YEAR II-SEMESTER SCHEME OF INSTRUCTION AND EXAMINATION
### WITH EFFECT FROM 2010-11 ADMITTED BATCH

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**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 & 1Tut/Week
Univ. Exam: 3Hours

Sessional Marks: 30
Univ. Exam-Marks: 70

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


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 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. Tanen banm

REFERENCE BOOK:
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

ASYMMETRIC KEY CRYPTOGRAPHIC ALGORITHMS: Overview of asymmetric key cryptography- RSA algorithm – symmetric and asymmetric key cryptography together - digital signatures - knapsack algorithm-some other algorithms.


PRACTICAL IMPLEMENTATIONS OF CRYPTOGRAPHY/ SECURITY: Cryptographic solutions using Java-Cryptographic solutions using Microsoft - cryptographic tool kits - 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:

REFERENCE BOOKS:
1. **Introduction to Data Mining:**
   Motivation and importance, What is Data Mining, Relational Databases, Data Ware houses, 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 Ware house? Multi-Dimensional Data Model, Data Ware house Architecture, Data Ware house 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
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 – ORIENTATION: 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:

References:

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


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


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


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 AND JAVA SERVER PAGES VOLUME 2: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson
FIRST CYCLE OF EXPERIMENTS

1.1 PC-to-PC COMMUNICATIONS UNDER DOS WITH NULL MODEM
   a) Using Serial Ports and RS-232C Cable Connection
   b) Using Parallel 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 WIN98's DIRECT CABLE CONNECTION with NULL MODEM
   a) Using Serial Ports and RS-232 C Cable Connection
   b) Using Parallel Ports and Parallel Cable Connection

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

1.5 PC – to - PC COMMUNICATIONS UNDER WIN98’s HYPER TERMINAL WITH MODEM and 4 – LINE EXCHANGE

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

1.7 a) LANWITH BUSTOPOLOGY with a minimum of two systems using NOVELL Netware
     b) LANWITHSTARTOPOLOGY with a minimum of two systems using NOVELL Netware

SECOND CYCLE OF EXPERIMENTS

2.1 INTERNET CONNECTION SET-UP USING DIAL-UP NETWORKING

2.2 TERMINAL NETWORK WITH UNIX/LINUXSERVER 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 THESOCKET 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
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 indoublelinespacingusing 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 for 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.
- Foot notes 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**

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 forty ping the general text. The general text shall be typed in the **Font style ‘Times New Roman’** and **Font size 14**.

* * * * *
TITLE OF PROJECT REPORT

A PROJECT REPORT

Submitted by

NAME OF THE CANDIDATE(S)

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 - 530003

MONTH & YEAR
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:: VISAKHPATNAM-530 003

MAY 2005
(A typical specimen of Bonafide Certificate)

ANDHRA UNIVERSITY: VISAKHAPATNAM-530 003

BONAFIDE CERTIFICATE

Certified that this project report “……..TITLE OF THE PROJECT……………..” is the bonafide work of “…………NAMEOFTHECANDIDATE(S)……………” who carried out the project work under my supervision.

<<Signature of the Head of the Department>>
SIGNATURE
<<Name>>
HEAD OF THE DEPARTMENT
<<Academic Designation>>

<<Signature of the Supervisor>>
SIGNATURE
<<Name>>
SUPERVISOR

<<Department>>
<<Full address of the Dept & College >>
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