

FIVE-YEAR INTEGRATED  
MASTER OF SCIENCE IN (INFORMATION TECHNOLOGY)  
M.S.( INFORMATION TECHNOLOGY) - M.S(IT)

SYLLABUS

For

2<sup>nd</sup> Year I & II -Semesters

With effect from 2007-08 admitted batch

Chairman

Board of Studies

(2005-08)

Department of Computer Science & Systems Engineering

College of Engineering

Andhra University

Visakhapatnam

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY - M.S.(CSIT)**

**Course Structure and Scheme of Examination**

**With Effect From 2007-08 Admitted Batch**

**2<sup>nd</sup> year I Semester**

Sub. Ref. No.	Name of the Subject	Periods					Max. Marks		
		Theory	Tutorial	Lab	Exam.	Sessionals	Total	Credits	
MSCSIT 2.1.1	Basic Electronics	3	1		70	30	100	4	
MSCSIT 2.1.2	Discrete Mathematical Structures	3	1		70	30	100	4	
MSCSIT 2.1.3	Data Structures	3	1		70	30	100	4	
MSCSIT 2.1.4	Digital Logic Design	3	1		70	30	100	4	
MSCSIT 2.1.5	Probability, Statistics and Queuing Theory	3	1		70	30	100	4	
MSCSIT 2.1.6	Electronics Lab			3	50	50	100	2	
MSCSIT 2.1.7	Data Structures Lab			3	50	50	100	2	
<b>TOTAL</b>							<b>700</b>	<b>24</b>	

MSCSIT 2.1.1

## BASIC ELECTRONICS

Instruction: 3 Periods &amp; 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, capacitance 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 &amp; Halkias

MSCSIT 2.1.2      DISCRETE MATHEMATICAL STRUCTURES

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 Kenneth. H. Rosen, , Tata McGraw-Hill Publishing Company, New Delhi
- 2) “ Discrete mathematics” by Richard Johnsonbaug, Pearson Education, New Delhi

MSCSIT 2.1.3

## DATA STRUCTURES

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 O 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:** Dijkstra'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 (2<sup>nd</sup> 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.

MSCSIT 2.1.4

DIGITAL LOGIC DESIGN

Instruction: 3 Periods &amp; 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 and 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, 3<sup>rd</sup> 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, 2<sup>nd</sup> 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



## MSCSIT 2.1.5      PROBABILITY, STATISTICS & QUEUING THEORY

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 binomial 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, correlation coefficient, 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.

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:  $\alpha$  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

MSCSIT 2.1.6

ELECTRONICS LAB.

Lab: 3 Periods/week

Sessional Marks: 50

Univ-Exam : 3 Hours

Univ-Exam Marks:50

1. Input and Output Characteristics of a BJT in the CE mode.
2. Half Wave and Full Wave rectifiers.
3. R C Coupled amplifier – Frequency response with and without feedback.
4. Transistor Inverter.
5. Colpitts Oscillator.
6. Op-amp as an inverting and non-inverting amplifier.
7. Astable multivibrator.
8. Self-bias binary.
9. Logic Gates using diodes and transistors.

## MSCSIT 2.1.7

## DATA STRUCTURES LAB.

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

M.S.(Information Technology )

SYLLABUS

For

2<sup>nd</sup> Year

II-Semester

With effect from 2007-08 admitted batch

Chairman

Board of Studies

(2005-08)

Department of Computer Science & Systems Engineering

College of Engineering

Andhra University

Visakhapatnam

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY - M.S.(IT)**

**Course Structure and Scheme of Examination**

**With Effect From 2007-08 Admitted Batch**

**2<sup>nd</sup> year II Semester**

Sub. Ref. No.	Name of the Subject	Periods			Max.Marks			
		Theory	Tutorial	Lab	Exam	Sessionals	Total	Credits
MSCSIT2.2 .1	File Structures	3	1		70	30	100	4
MSCSIT2.2 .2	Operating Systems Principles	3	1		70	30	100	4
MSCSIT2.2 .3	Computer Organisation	3	1		70	30	100	4
MSCSIT2.2 .4	Object Oriented Programming	3	1		70	30	100	4
MSCSIT2.2 .5	Formal Languages & Automata Theory	3	1		70	30	100	4
MSCSIT2.2 .6	File Structures Lab			3	50	50	100	2
MSCSIT2.2 .7	Object Oriented Programming			3	50	50	100	2
<b>TOTAL</b>							<b>700</b>	<b>24</b>

## MSCSIT 2..2.1

## FILE STRUCTURES

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<sup>+</sup> Trees**

Indexed sequential access, maintaining a sequence set, adding a simple index to the sequence set, the content of the index: separators instead of keys, the simple prefix B<sup>+</sup> tree, simple prefix B<sup>+</sup> tree maintenance, index set block size, internal set block size, internal structure of index set blocks: a variable order B-tree, loading a simple prefix B<sup>+</sup> tree

### **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<sup>++</sup> by Michael J. Folk, Bill Zoellick and Greg Riccardi,, Pearson



MSCSIT 2.2.2

## OPERATING SYSTEMS PRINCIPLES

Instruction: 3 Periods &amp; 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

MSCSIT 2.2.3

## COMPUTER ORGANIZATION

Instruction: 3 Periods &amp; 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 Prentice Hall , 2007

**Reference Book:**

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

MSCSIT 2.2.4

## OBJECT ORIENTED PROGRAMMING

Instruction: 3 Periods &amp; 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. **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. 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 Robot Laphore.
8. Object Oriented Analysis and Design by Andrew Haigh – (Tata Mcgrah Hjill.)

## MSCSIT 2.2.5      FORMAL LANGUAGES AND AUTOMATA THEORY

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  $\epsilon$ -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 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.

**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.

MSCSIT 2.2.6

## FILE STRUCTURES LAB

Practical : 3 Periods /Week

Sessional Marks : 50

Univ-Exam : 3 Hours

Univ-Exam Marks:100

### **1. File Operations:**

Opening, reading, writing, closing and creating of files in C<sup>++</sup>

### **2. Study of secondary storage devices:**

Tracks, sectors, block capacity of disk, tape and CDROMs

### **3. File Structures in C<sup>++</sup>**

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<sup>++</sup> trees

### **6. Hashing files**

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

## MSCSIT 2.2.7

## OBJECT ORIENTED PROGRAMMING LAB.

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.

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY - M.S.(IT)**

**Course Structure and Scheme of Examination**

**With Effect From 2007-08 Admitted Batch**

**3<sup>rd</sup> year I Semester**

Sub. Ref. No.	Name of the Subject	Periods			Max. Marks			
		Theory	Tutorial	Lab	Exam	Sessionals	Total	Credits
MSCSIT 3.1.1	Operating Systems Internals	3	1		70	30	100	4
MSCSIT 3.1.2	Microprocessors	3	1		70	30	100	4
MSCSIT 3.1.3	Database Management Systems	3	1		70	30	100	4
MSCSIT 3.1.4	Computer Networks	3	1		70	30	100	4
MSCSIT 3.1.5	Theory of Programming Languages	3	1		70	30	100	4
MSCSIT 3.1.6	Operating Systems Lab			3	50	50	100	2
MSCSIT 3.1.7	Computer Organisation Lab			3	50	50	100	2
<b>TOTAL</b>							<b>700</b>	<b>24</b>

**Scheme Of Valuation Is Same As UG Courses Of Andhra University College Of Engineering**

MSCSIT 3.1.1

## OPERATING SYSTEMS INTERNALS

Instruction: 3 Periods &amp; 1Tut./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



MSCSIT 3.1.2

## MICROPROCESSORS

Instruction: 3 Periods &amp; 1Tut./Week

Sessional Marks: 30

Univ\_Exam: 3 Hours

Univ\_ Exam Marks:70

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

**Programming the 8085  $\mu$ P.:** 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  $\mu$ P. 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  $\mu$ P.:** 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

An overview of Advanced Microprocessors: 80286,80386,80486, Pentium Processors

**TEXT BOOKS:**

1. Microprocessor Architecture, Programming, and Applications with the 8085 Ramesh S. Gaonkar, 4<sup>th</sup> Edition, Penram,International, 1999
2. The 80x86 Family, Design, Programming and Interfacing, John E.Uffenbeck, 3<sup>rd</sup> Edition, Pearson Education Inc., 2002
3. Advanced Microprocessors, Daniel Tabak, 2<sup>nd</sup> Ed., McGrawHill,Inc., 1995

**REFERENCE BOOKS:**

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

MSCSIT 3.1.3

## DATABASE MANAGEMENT SYSTEMS

Instruction: 3 Periods &amp; 1Tut./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 3<sup>rd</sup> & 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

MSCSIT 3.1.4

## COMPUTER NETWORKS

Instruction: 3 Periods &amp; 1Tut./Week

Sessional Marks: 30

Univ\_Exam: 3 Hours

Univ\_ Exam Marks:70

1. Introduction: Data communications, Networks, The Internet, Protocol & Standards
2. Network Models: Layered tasks, Internet model, OSI model
3. Physical layer:
  - 3.1 Signals: Analog and digital signals, data rate limits, Transmission impairment, Signal measurements like throughput, propagation speed and time, wave length
  - 3.2 Digital Transmission: Line coding, block coding, sampling, transmission mode
  - 3.3 Analog Transmission: Modulation digital data, telephone modem, Modulation analog signals
  - 3.4 Multiplexing: FDM, WDM, TDM
  - 3.5 Transmission Media: Guided media, unguided media
  - 3.6 Circuit Switching & Telephone Network: Circuit switching, telephone network
4. Data Link Layer:
  - 4.1 Error detection and Correction: Type of errors, detection and correction of errors
  - 4.2 Data Link Control & Protocol: Flow & error control, Stop-And-Wait ARQ, Go-Back-N ARQ, Select Repeat ARQ, HDLC
  - 4.3 Point-To-Point Access: Point-to-point protocol, PPP stack
  - 4.4 Local Area Network: Traditional Ethernet, fast and gigabit Ethernets
  - 4.5 Connecting LANs, Backbone Networks and Virtual LANs: Connecting devices, Backbone networks, Virtual LANs
5. Network Layer:
  - 5.1 Internetworks, Addressing, Routing
  - 5.2 Network Layer Protocols: ARP, IP, ICMP, IPV6
  - 5.3 Unicast routing, Unicast routing protocols, Multi routing, Multicast routing protocols

6. Transport Layer:

6.1 Process-To-Process delivery, user data gram, Transmission control protocol

7. Application Layer:

7.1 Client-Server Model: Client-Server model, Socket interface

7.2 A brief introduction to DNS, SMTP, FTP

Text Book:

Data Communications and Networking, Behrouz A. Forouzan, 3<sup>rd</sup> Edition, Tata Mcgraw- Hill Publishing Co

Reference Book:

Understanding Data Communications and Networks, William A Shay, 2<sup>nd</sup> Edition, Vikas Publishing House

## MSCSIT 3.1.5      THEORY OF PROGRAMMING LANGUAGES

Instruction: 3 Periods & 1Tut./Week

Sessional Marks: 30

Univ\_Exam: 3 Hours

Univ\_ Exam Marks:70

1. The Role of Programming Languages:- Toward Higher- level Languages, Problems of Scale, Programming Paradigms, Language Implementation Bridging the Gap
2. Language Description: - Syntactic Structure: Expression Notations, Abstract Syntax Trees, Lexical Syntax, Context -Free Grammars, Grammars for Expressions, Variants of Grammars

### I      IMPERATIVE PROGRAMMING:

3. Statements: Structured Programming:- The Need for Structured Programming, Syntax-Directed Control Flow, Design Considerations: Syntax, Handling Special Cases in Loops, Programming with invariants, Proof Rules for Partial Correctness, Control flow in C.
4. Types: Data Representation:- The Role of Types, Basic Types, Arrays Sequences of Elements, Records: Named Fields, Unions and variant Records, Sets, Pointers: Efficiency and Dynamic Allocation, Two String Tables, Types and Error Checking.
5. Procedure Activations:- Introduction to Procedures, Parameter-passing Methods, Scope Rules for Names, Nested Scopes in the Source Text, Activation Records, Lexical Scope: Procedures as in C, Lexical Scope: Nested Procedures and Pascal.

### II      OBJECT ORIENTED PROGRAMMING:

6. Groupings of Data and Operations:- Constructs for Program Structuring, Information Hiding, Program Design with Modules, Modules and Defined Types, Class Declarations in C++, Dynamic Allocation in C++, Templates: Parameterized Types, Implementation of Objects in C++.
7. Object-Oriented Programming:- What is an Object?, Object- Oriented Thinking, Inheritance, Object-Oriented Programming in C++, An extended C++ example, Derived Classes and information Hiding, Objects in Smalltalk, Smalltalk Objects have self.

### III      FUNCTIONAL PROGRAMMING:

8. Elements of Functional Programming:- A little Language of expressions, Types : Values and Operations, Function declarations, Approaches to Expression Evaluation, Lexical Scope, Type Checking.

9. Functional Programming in a Typed Languages:- Exploring a List, Function Declaration by Cases, Functions as First-Class Values, ML: Implicit Types, Data Types, Exception Handling in ML, Little ML in Standard ML
10. Functional Programming with Lists:- Scheme, a Dialect of Lisp, The Structure of Lists, List Manipulation, A Motivating Example: Differentiation, Simplification of Expressions, Storage Allocation for Lists.

#### IV OTHER PARADIGMS:

11. Logic Programming:- Computing with Relations, Introduction to Prolog, Data Structures in Prolog, Programming Techniques, Control in Prolog, Cuts.
12. An Introduction to Concurrent Programming:- Parallelism in Hardware, Streams: Implicit Synchronization, Concurrency as interleaving, Liveness Properties, Safe Access to Shared Data, Concurrency in Ada, Synchronized Access to Shared variables.

#### Text Book:

1. Programming Languages – Concepts & Constructs , Ravi Sethi, Pearson Education.

#### References:

1. Programming Languages – Design & Implementation ,Terrance W. Pratt, Marvin V. Zelkowitz, Pearson Education.
2. Concepts of Programming Languages – Robert L. Sebesta, Pearson Education

## MSCSIT 3.1.6

## OPERATING SYSTEMS LAB

Practical : 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:

1. Unix Systems Programming : Communication, Concurrency and Threads, Kay Robbins, 2-Edition, Pearson Education
2. Unix concepts and applications, Sumitabha Das, TMH Publications.
3. Unix programming, Stevens, Pearson Education.
4. Shell programming, Yashwanth Kanetkar.
5. Operating System Concepts, Silberschatz, and Peter Galvin.

MSCSIT 3.1.7

COMPUTER ORGANIZATION LAB

Practical : 3 Periods /Week

Sessional Marks : 50

Univ-Exam : 3 Hours

Univ-Exam Marks:100

**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 & Sub tractors
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 8085 $\mu$ P Trainer.  
 Serial Monitor of 8085 $\mu$ P Trainer with Terminal  
 8085 Line Assembler of 8085 $\mu$ P Trainer with PC as Terminal  
 8085 Cross Assembler using In-Circuit Emulator (ICE) with 8085 $\mu$ P 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



M.S.(INFORMATION TECHNOLOGY)

COURSE STRUCTURE AND SCHEME OF EXAMINATION

For

3<sup>rd</sup> Year

II-Semester

With effect from 2007-08 admitted batch

Chairman

Board of Studies

(2005-08)

Department of Computer Science & Systems Engineering

College of Engineering

Andhra University

Visakhapatnam

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY - M.S.(IT)**

**Course Structure and Scheme of Examination**

**With Effect from 2007-08 Admitted Batch**

**3<sup>rd</sup> year II Semester**

Sub. Ref. No	Name of the Subject	Periods			Max.Marks			
		Theory	Tutorial	Lab	Exam	Sessionals	Total	Credits
MSCSIT 3.2.1	Unified Modeling Language	3	1		70	30	100	4
MSCSIT 3.2.2	Computer Graphics and Visualisation	3	1		70	30	100	4
MSCSIT 3.2.3	Systems Programming	3	1		70	30	100	4
MSCSIT 3.2.4	Internet and Intranet Engineering	3	1		70	30	100	4
MSCSIT 3.2.5	Elective II 1. Device Interfacing 2. Distributed Operating Systems	3	1		70	30	100	4
MSCSIT 3.2.6	Database Management Systems Lab			3	50	50	100	2
MSCSIT 3.2.7	Computer Networks Lab			3	50	50	100	2
TOTAL					700			24

*SCHEME OF VALUATION IS SAME AS UG COURSES OF ANDHRA UNIVERSITY COLLEGE OF ENGINEERING*

## MSCSIT 3.2.1 UNIFIED MODELING LANGUAGE

Instruction: 3 Periods & 1Tut./Week

Sessional Marks: 30

Univ\_Exam: 3 Hours

Univ\_ Exam Marks:70

Why We Model, The Importance of Modeling, Principles of Modeling, Object-Oriented Modeling, Introducing the UML, an Overview of the UML, a Conceptual Model of the UML, Architecture Software Development Life Cycle, Key Abstractions, Mechanisms, Artifacts.

Basic Structural Modeling, Classes, Terms and Concepts, Common Modeling Techniques, Relationships, Terms and Concepts, Common Modeling Techniques, Common Mechanisms, Common Modeling Techniques.

Diagrams, Terms and Concepts, Common Modeling Techniques, Class Diagrams, Terms and Concepts, Common Modeling Techniques.

Advanced Structural Modeling, Advanced Classes, Terms and Concepts, Common Modeling Techniques, Advanced Relationships, Terms and Concepts, Common Modeling Techniques,

Interfaces, Types, and Roles, Terms and Concepts, Common Modeling Techniques.

Packages, Terms and Concepts, Common Modeling Techniques, Instances, Terms and Concepts Common Modeling Techniques, Object Diagrams, Terms and Concepts, Common Modeling Techniques. Components, Terms and Concepts, Common Modeling Techniques.

Basic Behavioral Modeling, Interactions, Terms and Concepts, Common Modeling Techniques,

Use Cases, Terms and Concepts, Common Modeling Techniques, Use Case Diagrams, Terms and Concepts, Common Modeling Techniques, Interaction Diagrams, Terms and Concepts, Common Modeling Techniques, Activity Diagrams Terms and Concepts, Common Modeling Techniques.

Advanced Behavioral Modeling, Events and Signals, Terms and Concepts, Common Modeling Techniques, State Machines, Terms and Concepts, Common Modeling

Techniques, Processes and Threads, Terms and Concepts, Common Modeling Techniques, Time and Space, Terms and Concepts, Common Modeling Techniques.

State Diagrams, Terms and Concepts, Common Modeling Techniques, Architectural Modeling Artifacts, Terms and Concepts, Common Modeling Techniques, Deployment, Terms and Concepts, Common Modeling Techniques, Collaborations, Terms and Concepts, Common Modeling Techniques.

Patterns and Frameworks, Terms and Concepts, Common Modeling Techniques, Artifact Diagrams, Terms and Concepts, Common Modeling Techniques, Deployment Diagrams, Terms and Concepts, Common Modeling Techniques, Systems and Models, Terms and Concepts, Common Modeling Techniques.

Text Book:

The Unified Modeling Language User guide, 2<sup>nd</sup> Edition

Authors: Grady Booch, James Rumbaugh and Ivar Jacobson

Publisher: Pearson Education

## MSCSIT 3.2.2 COMPUTER GRAPHICS AND VISUALIZATION

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 Francis S Hill Jr Pearson Education, 2004.

MSCSIT 3.2.3

## SYSTEMS PROGRAMMING

Instruction: 3 Periods &amp; 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

## MSCSIT 3.2.4 INTERNET AND INTRANET ENGINEERING

Instruction: 3 Periods & 1Tut./Week

Sessional Marks: 30

Univ\_Exam: 3 Hours

Univ\_ Exam Marks:70

1. INTRODUCTION:           The Internet/Intranet landscape,  
                                  The Internet: A Short Retrospective;  
                                  The TCP/IP Standardization Approach to Internet and Intranets,  
                                  Network Topologies for Intranets  
  
                                  Internet Protocol Model Overview  
  
                                  Internet Addresses: Foundations for Internet and Intranets  
  
                                  Internet Protocol: Basis for Internet and Intranets  
  
                                  Internet Access  
  
                                  Internet Applications
2.     ROUTER TECHNOLOGY
3.     INTERNET AND INTRANET WEB SERVER TECHNOLOGY, ACCESS AND PROTOCOLS
4.     HTML TECHNOLOGY, APPLICATIONS, AND EXAMPLES:  
  
          Introduction, The Nuts and Bolts of HTML  
  
          Practical Considerations for internet/Intranet pages.
5.     ON-LINE SERVICES
6.     BROADBAND COMMUNICATIONS FOR THE INTERNET AND INTRANETS

**Text Book: Daniel Minoli, Internet and Intranet Engineering, Technologies, Protocols, and Applications, McGraw-Hill, 1997**

**References:** S.Keshay, An Engineering Approach to Computer Networking, ATM Networks, the Internet, and the telephone Network, Pearson Education, 2003

Douglas E Comer, Computer Networks and internet, 2/e, Pearson Education, 2005



MSCSIT 3.2.5

ELECTIVE: DEVICE INTERFACING

Instruction: 3 Periods &amp; 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, 4<sup>th</sup> Edition, Penram International, 1999
2. The 80x86 Family, Design, Programming and Interfacing, John E. Uffenbeck, 3<sup>rd</sup> Edition, Pearson Education Inc., 2002
3. Kenneth J. Ayala, 8051 Microcontroller architecture, programming and applications, 2<sup>nd</sup> 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, 6<sup>th</sup> Edition, Pearson Education Inc., 2003
2. Walter A. Tribel and Avtar Singh, The 8088 and 8086 Microprocessors, Programming, interfacing, Software, Hardware, and Applications, 4<sup>th</sup> Edition, Pearson Education Inc., 2003
3. Microprocessors and Interfacing, Programming and Hardware, 2<sup>nd</sup> 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

**MSCSIT 3.2.5 ELECTIVE: DISTRIBUTED OPERATING SYSTEMS**

Instruction: 3 Periods & 1Tut./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 Niranjana G.Shivaratna.

## MSCSIT 3.2.6 DATA BASE MANAGEMENT SYSTEMS LAB

Practical : 3 Periods /Week

Sessional Marks : 50

Univ-Exam : 3 Hours

Univ-Exam Marks:100

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.

Practical : 3 Periods /Week

Sessional Marks : 50

Univ-Exam : 3 Hours

Univ-Exam Marks:100

1. Identifying well known ports on a Remote System : By trying to listen to the various well known ports by opening client connections. If the exception does not occur then the remote port is active else the remote port is inactive.
2. Writing a Chat application:
  - i). One-One: By opening socket connection and displaying what is written by one party to the other.
  - ii). Many-Many (Broad cast): Each client opens a socket connection to the chat server and writes to the socket. Whatever is written by one party can be seen by all other parties.
3. Data retrieval from a Remote database: At the remote database a server listens for client connections. This server accepts SQL queries from the client, executes it on the database and sends the response to the client.
4. Mail Client:
  - i). POP Client : Gives the server name , user name and password retrieve the mails and allow manipulation of mail box using POP commands.
  - ii). SMTP Client : Gives the server name, send e-mail to the recipient using SMTP commands- (Core Java 2 pg:163.)
5. Simulation of Telnet: Provide a user interface to contact well-known ports, so that client- server interaction can be seen by the user.
6. Simple file transfer between two systems ( without protocols): By opening socket connection to our server on one system and sending a file from one system to another.
7. TFTP- Client: To develop a TFTP client for file transfer. (Unix Network programming- Stevens.)
8. HTTP-Server: Develop a HTTP server to implement the following commands. GET, POST, HEAD, DELETE. The server must handle multiple clients.

Reference Books : 1. Java Network Programming, Harold Orielly

2. An Introduction to Computer Networking, Kenneth C. Mansfield Jr and James L. Antonakos  
Pearson Education Asia

**5-year Integrated B.TECH/M.TECH Programme**

**SOFTWARE ENGINEERING**

**WITH EFFECT FROM 2009-10 ADMITTED BATCH**

**SYLLABI**

*(Tentative)*

CHAIRMAN  
BOARD OF STUDIES

**DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING**

**COLLEGE OF ENGINEERING**

**ANDHRA UNIVERSITY**

**VISAKHAPATNAM-3**

**5 - YEARS INTEGRATED B.TECH/M.TECH PROGRAMME (CSIT)  
COURSE STRUCTURE AND SCHEME OF EXAMINATION**

**For**

**4th Year**

**I-Semester**

**Chairman**

**Board of Studies**

**Department of Computer Science & Systems Engineering**

**College of Engineering**

**Andhra University**

**Visakhapatnam**

5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)  
 Course Structure and Scheme of Examination  
 With Effect from 2009-10 Admitted Batch

#### 4<sup>th</sup> year I Semester

Sub. Ref. No.	Name of the Subject	Periods			Max. Marks			
		Theory	Tutorial	Lab	Exam	Sessional	Total	Credits
MSCSIT 4.1.1	Computer Networks							
MSCSIT 4.1.2	Web Technologies	3	1		70	30	100	4
MSCSIT 4.1.3	Object Oriented Software Engg.	3	1		70	30	100	4
MSCSIT 4.1.4	Data Warehousing	3	1		70	30	100	4
MSCSIT 4.1.5	Human Computer Interaction	3	1		70	30	100	4
MSCSIT 4.1.6	Elective - I	3	1		70	30	100	4
MSCSIT 4.1.7	Computer Networks Lab			3	50	50	100	2
MSCSIT 4.1.8	Web Technologies Lab			3	50	50	100	2
<b>TOTAL</b>							<b>800</b>	<b>28</b>

Elective-I:

[1] Digital Forensics. [2] Image Processing [3] System Administration [4] Artificial Intelligence [5] Bio-informatics



**MSCSIT 4.1.1****COMPUTER NETWORKS****Credits:4**

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

Sessional Marks: 30  
 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 7<sup>th</sup> Edition, Pearson Education, 2004

**Reference Books:**

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

MSCSIT 4.1.2

WEB TECHNOLOGIES

Credits:4

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

Sessional Marks: 30  
 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 Servlets: Lifecycle of a Servlet, The Servlet API, The javax.servelet Package, Reading Servlet 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:

Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.  
 Advanced Java™ 2 Platform How to Program, Deitel/Deitel/Santry  
 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

MSCSIT 4.1.3                      OBJECT ORIENTED SOFTWARE ENGINEERING      Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Software Engineering: Software related problems, software engineering, concepts, development activities

Modeling: Modeling with UML

Project Communications: Project communication, modes, mechanisms and activities

Requirements: Requirements elicitation, concepts, activities & managing requirements elicitation

Analysis: Analysis overview, concepts, activities and managing analysis

System Design: Design overview, concepts, activities and managing system design

Object Design: Object design overview, concepts, activities and managing object design

Rationale Management: Rationale overview, concepts, activities and managing rationale

Testing; Testing overview, concepts, activities and managing testing

Software Configuration Management: Configuration Management overview, concepts, activities and managing configuration management

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

MCSIT 4.1.4

DATA WAREHOUSING

Credits:4

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

Sessional Marks: 30  
 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, MorganKaufman Publications

MSCSIT 4.1.5. HUMAN COMPUTER INTERACTION Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Importance of user Interface- definition, importance of good design. Benefits of good design. A brief history of screen design.

The graphical user interface –definition of graphics, the concept of direct manipulation , graphical system, Characteristics, web user—interface popularity, characteristics—principles of user interface.

Design Process-Human Interaction With Computers, Importance of Human Characteristics Human Consideration, Human Interaction Speeds, Understanding Business Junctions.

Screen Designing — Design goals—screen planning and purpose, organizing screen elements, ordering of screen data and content—screen navigation and flow—visually pleasing composition –amount of information –information retrieval on web –statistical graphics—technological consideration in interface design.

Windows— New and Navigation schemes selection of window, selection of device based and screen based controls.

Components— text and messages, Icons and increases — Multimedia, colors, uses problems, choosing colors.

Software tools -- Specification methods, interface — Building Tools.

Interaction Devices—Keyboard and function keys—pointing devices—speech recognition digitization and generation—image and video displays—drivers

Text Books:

The essential guide to user interface design, Wilbert O Galitz, Wiley Dream Tech  
Designing the user interface. 3rd Edition ben Shneidermann, Pearson Education Asia

Reference Books:

Human-Computer Interaction. Alan Dix, Janet Finckay, Gre Goryd, Abowd, Rusell Bealg, Pearson Education

Interaction Design Prece, Rogers, Sharps. Wiley Dream Tech

User Interface Design, Soren Lausen, Pearson Education.

MSCSIT 4.1.6 ELECTIVE-I

DIGITAL FORENSICS

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction: cyber crime-forensics-Terminology legal systems, Phase of cyber Forensics.

Evidence collection: Legal view of Digital evidence, Methods of evidence collection, Forensic Science and Evidence.

Event Re-Construction: Based on Evidence, Algorithms for eventry construction and evaluation.

Analysis: Analysis of evidence, Methods of analyzing evidence, comparisions and conclusions.

Preservative and presentation: Preservation of digital evidences various methods of presentation with legal systems.

Usage of tools: SNORT, LEDA

**MSCSIT 4.1.6 ELECTIVE-I****IMAGE PROCESSING****Credits:4**

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

Sessional Marks: 30  
 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 edgeenhancement 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, Addison Wesley

MSCSIT 4.1.6 ELECTIVE-I      SYSTEM ADMINISTRATION

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction to System Administration

The Unix Way

Essential Administrative Tools and Techniques

Startup and Shutdown

TCP/IP Networking

Managing Users and Groups

Security

Managing Network Services

Electronic Mail

Filesystems and Disks

Backup and Restore

Serial Lines and Devices

Printers and the Spooling Subsystem

Automating Administrative Tasks

Managing System Resources

Configuring and Building Kernal

Accounting

Text Book:

Essential system administration by Aileen Frisch, O'Reilly Media, Inc., 2002



MSCSIT 4.1.6 ELECTIVE-I      ARTIFICIAL INTELLIGENCE

Credits:4

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

Sessional Marks: 30  
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

MSCSIT 4.1.6 ELECTIVE-I

BIO-INFORMATICS

Credits:4

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

Sessional Marks: 30  
 Univ-Exam-Marks:70

Introduction: Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy.

Protein Information Resources: Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.  
 Genome Information Resources: DNA sequence databases, specialized genomic resources

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.

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.

Multiple sequence alignment: Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching.

Secondary database searching: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

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, Cedric Notredame  
WILEY dreamlech India Pvt. Ltd

#### Reference Books:

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

Practical : 3 Periods  
Univ-Exam : 3 Hours

Sessional Marks : 50  
Univ-Exam Marks:50

1. Identifying well known ports on a Remote System :  
By trying to listen to the various well known ports by opening client connections. If the exception does not occur then the remote port is active else the remote port is inactive.
2. Writing a Chat application :
  - i). One-One: By opening socket connection and displaying what is written by one party to the other.
  - ii). Many-Many (Broad cast): Each client opens a socket connection to the chat server and writes to the socket. Whatever is written by one party can be seen by all other parties.
3. Data retrieval from a Remote database:  
At the remote database a server listens for client connections. This server accepts SQL queries from the client, executes it on the database and sends the response to the client.
4. Mail Client:
  - i). POP Client : Gives the server name , user name and password retrieve the mails and allow manipulation of mail box using POP commands.
  - ii). SMTP Client : Gives the server name, send e-mail to the recipient using SMTP commands- (Core Java 2 pg:163.)
5. Simulation of Telnet:  
Provide a user interface to contact well-known ports, so that client-server interaction can be seen by the user.
6. Simple file transfer between two systems ( without protocols):  
By opening socket connection to our server on one system and sending a file from one system to another.
7. TFTP- Client:  
To develop a TFTP client for file transfer. (Unix Network programming- Stevens.)
8. HTTP-Server:  
Develop a HTTP server to implement the following commands. GET, POST, HEAD, DELETE.  
The server must handle multiple clients.

Reference Books : 1. Java Network Programming, Harold Orielly  
2. An Introduction to Computer Networking, Kenneth C. Mansfield Jr and James L. Antonakos Pearson Education Asia

MSCSIT 4.1.8

WEB TECHNOLOGIES LAB

Credits: 2

Instruction: 3 Periods

Univ. Exam : 3 Hours

Sessional Marks: 50

Univ-Exam-Marks:50

Each student should develop two projects out of this list using JSP,JDBC,J2EE

1. Design Airlines Ticket Reservation System
2. Design ONLINE Banking system.
3. Design Library Information system
4. Design Gram Panchayat Information system for House tax, water tax, wealth tax, Library tax collection, phone bill, Electricity bill collection
5. Design student information system portal which maintain attendance, marks etc.
6. Design online examination system.

## 5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)

Course Structure and Scheme of Examination  
With Effect from 2009-10 Admitted Batch

4<sup>th</sup> year II Semester

Sub. Ref. No.	Name of the Subject	Periods			Max. Marks			
		Theory	Tutorial	Lab	Exam	Sessionals	Total	Credits
MSCSIT 4.2.1	Service Oriented Architectures	3	1		70	30	100	4
MSCSIT 4.2.2	E-Commerce	3	1		70	30	100	4
MSCSIT 4.2.3	Network Security & Cryptography	3	1		70	30	100	4
MSCSIT 4.2.4	Advanced Databases	3	1		70	30	100	4
MSCSIT 4.2.5	Project-I (internal)							4
MSCSIT 4.2.6	Elective- II	3	1		70	30	100	4
MSCSIT 4.2.7	Data Warehousing Lab	3	1		70	50	100	2
MSCSIT 4.2.8	Software Engineering Lab			3	50	50	100	2
<b>TOTAL</b>							<b>800</b>	<b>28</b>

Elective-II:

[1] Information Retrieval [2] Machine Learning [3] Network Management [4] Infrastructural Management [6] Geographical information systems .

MCSIT 4.2.1

SERVICE ORIENTED ARCHITECTURES

Credits:4

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

Sessional Marks: 30  
 Univ-Exam-Marks:70

**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).

**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;

**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;

**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;

**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:

Service-Oriented Architecture Concepts and Technology and Design-Thomas Erl, Pearson Education, 2005

Understanding SOA with Web Services – Eric Newcomer, Greg Lomow, Pearson Education, 2005

Developing Enterprise Web Services – An Architect’s Guide – Sandeep Chatterjee, James Webber Pearson Education, ISBN 81-297-0491-9

References:

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

MSCSIT 4.2.2

E-COMMERCE

Credits:4

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

Sessional Marks: 30  
 Univ-Exam-Marks:70

Electronic commerce environment and opportunities: Back ground – The Electronic commerce Environment – Electronic Market Place Technologies.

Modes of electronic commerce: Overview – EDI – Migration to open EDI – E commerce with WWW/Internet – Commerce Net Advocacy – Web commerce going forward.

Approaches to safe electronic Commerce – Overview – Source – Transport Protocols – Secure Transactions – Secure Electronic Payment Protocol – Secure Electronic Transaction – Certificates for Authentication – Security on Web Servers and enterprise networks.

Electronic cash and electronic payment schemes – Internet Monetary Payment and Security requirements – payment and purchase order process – online electronic cash.

Master card/ Visa Secure electronic transaction: Introduction – Business requirements - Concepts - Payment Processing. Email and Secure Email Technologies for Electronic Commerce: Introduction – The means of Distribution – A model for Message Handling – How Does a Email Work.

Internet Resources for Commerce: Introduction – Technologies for Web Servers – Internet Applications for commerce – Internet Charges – Internet Access and Architecture – Searching the Internet.

**Text Books:** Web Commerce Technology Hand Book Daniel Minoli, Emma Minoli McGraw Hill

**Reference:** Frontiers of Electronic Commerce Ravi Kalakotar, Andrew B. Whinston Addison-Wesley

MSCSIT 4.2.3

NETWORK SECURITY AND CRYPTOGRAPHY

Credits:4

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

Sessional Marks: 30  
 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:

Network Security Private Communication in a public world, Charlie Kaufman, Radia Perlman & Mike Speciner, Prentice Hall of India Private Ltd., New Delhi.

Network Security Essentials Applications and Standards, William Stallings, Pearson Education, New Delhi

Network Security: The Complete Reference by Roberta Bragg, Mark Phodes-Ousley, Keith Strasberg  
 Tata McGraw-Hill



MSCSIT 4.2.4

## Advanced Databases

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction

Syntax and Semantics of Active Devices

Applications of Active databases

Design Principles for Active Rules

Overview of Temporal Database

TSQL-2

Implementation

Logic of Query Languages

Implementation of Rules and Recursion

Database Updates and Nonmonotonic Reasoning

Text Book:

Advanced database systems By Carlo Zaniolo, Morgan Kaufmann, 1997

MSCSIT 4.2.5

Project-1  
( Internal )

Credits: 4

The project is an internal project with the problem defined by the guide. It is evaluated internally

MSCSIT 4.2.6 Elective- II

INFORMATION RETRIEVAL

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

**Introduction:** Introduction to the topic, Emerging trends of Information Management Evolution of IOD.

**Developments in Relational Databases:** XML Processing capabilities, PureQuery, Tools for common operations.

**Enterprise Content Management:** Technologies, strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to an organization and its processes. Introduction to Records Management and Compliance, Categorization of Large volumes of data (Content classification and Search).

**Information Integration:** Process of information integration, using data abstraction to provide a single interface for viewing all the data within an organization, techniques to arrive at a single set of structures and naming conventions to get a large set of heterogeneous data sources to appear to a user or system as a single, homogeneous data source.

**Data Warehousing:** Techniques, methods and strategies to retrieve and analyze data, to extract, transform and load data, and to manage the data dictionary for a data warehousing system.

**Master Data Management:** Overview and concepts for collecting, aggregating, matching, consolidating, quality assuring, persisting and distributing such (Non-Transactional) data to ensure consistency and control in the ongoing maintenance and application use of this information. Introduction to domains, overview of key concepts and benefits of MDM.

**Trends in Data Replication:** Overview of Replication Methods, Log based replication, Challenges of replication in distributed data environments, Advantages of replication in Disaster recovery and High Availability Processes.

**Business Intelligence:** Introduction to Business Intelligence and Performance Management. Reporting and Analytics, Concepts, Techniques and Methods to help a business acquire a better understanding of its commercial context. OLAP, analytics, data mining, business performance management, benchmarks, text mining and predictive analytics.

**Meta Data Management:** Concepts to drive data Lineage from databases to Reporting.

**Integrated Data Management:** Challenges in data growth management, data privacy compliance, e-discovery, migration to different data repositories.

**Applied Intelligence:** Real world implementations on Information Integration and Analytics: Threat and Fraud Detection, Usage of RFID technology to track flow of information in a supply chain, Mashups – their relevance in Enterprises.

MSCSIT 4.2.6 Elective- II

MACHINE LEARNING

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Learning Problems, Least mean squares algorithm, Designing a learning system, Concept learning task, Find-S algorithm, Version Spaces and Candidate Elimination algorithm, Inductive bias, Decision tree learning, ID3 algorithm, Issues in decision tree learning, Artificial Neural networks- Gradient Descent learning rule, Multilayer feed forward networks, Back-propagation Algorithm, Bayesian Learning-Bayes Theorem, Maximum Likelihood hypotheses, Baye's optimal classifier, Naïve Baye,s Classifier, Bayesian belief networks, EM algorithm, Computational Learning Theory: probably approximately correct (PAC) learning. Computational complexity of training. Instance-Based Learning: k-Nearest-neighbor algorithm, Radial basis functions. Case-based learning. Genetic Algorithms, Genetic Programming, Learning sets of rules-Sequential covering algorithms, Learning first-order rules, Inverting resolution, Analytical Learning, Combining inductive and analytical learning, KBANN algorithm, EBNN algorithm, Using prior knowledge to augment search, Reinforcement Learning

**Text Book:** Tom M. Mitchell, : "Machine Learning", McGraw Hill International Edition, 1997.

MSCSIT 4.2.6 Elective- II      NETWORK MANAGEMENT

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Network Architectures

The functions of Network Management

Network Concepts Involved in Network Management

Standardization and Network Management Architecture

Standardized Network Management Applications

Telecommunication Management Works

Management of Operators and the Man-Machine Interface

Network Management Platforms and Integrators

Text Book:

Network management: concepts and tools By Arpege Group, Edward Sturt, Springer, 1994

**MSCSIT 4.2.6 Elective-II INFRASTRUCTURAL MANAGEMENT****Credits:4**

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

Sessional Marks: 30  
 Univ-Exam-Marks:70

Definitions, Infrastructure management activities, Evolutions of Systems since 1960s (Mainframes-to-Midrange-to-PCs-to-Client-server computing-to-New age systems) and their management, growth of internet, current business demands and IT systems issues, complexity of today's computing environment, Total cost of complexity issues, Value of Systems management for business

Preparing for Infrastructure Management Factors to consider in designing IT organizations and IT infrastructure, Determining customer's Requirements, Identifying System Components to manage, Exist Processes, Data, applications, Tools and their integration, Patterns for IT systems management, Introduction to the design process for information systems, Models, Information Technology Infrastructure Library (ITIL) Service Delivery Processes Service-level management, financial management and costing, IT services continuity management, Capacity management, Availability management.

Service Support Processes Configuration Management, Service desk, Incident management, Problem management, Change management, Release management.

Storage and Security Management Introduction Security, Identity management, Single sign-on, Access Management, Basics of network security, LDAP fundamentals, Intrusion detection, firewall, security information management Introduction to Storage, Backup & Restore, Archive & Retrieve, Space Management, SAN & NAS, Disaster Recovery, Hierarchical space management, Database & Application protection, Bare machine recovery, Data retention.

Reference Books:

1. Foundations of IT Service Management: based on ITIL, by Jan Van Bon, Van Haren Publishing, 2nd edition 2005
2. Floyd Piedad, Michael Hawkins, "High Availability: Design, Techniques, and Processes", Prentice Hall, 2000
3. Harris Kern, Stuart Galup, Guy Nemiro, "IT Organization: Building a Worldclass Infrastructure", Prentice Hall, 2000
4. Rich Schiesser, "IT Systems Management: Designing, Implementing, and Managing World-Class Infrastructures", Prentice Hall PTR; 2001

MSCSIT 4.2.6 Elective- II GEOGRAPHICAL INFORMATION SYSTEMS

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction: Definition of GIS and Related Terminology-Evolution of GIS-Components of GIS-Approaches to study of GIS

Maps and GIS: Introduction-Map Scale- Classes of maps-The mapping Process-Plane coordinate systems and Transformations- Geographic Coordinate System of Earth- Map Projection- Establishing a spatial framework for mapping Locations on Earth- Georeferencing- Acquisition of Spatial Data for the terrain- Topographic Mapping-Attribute Data for Thematic Mapping

Digital Representation of Geographic Data: Introduction-Technical Issues Pertaining to Digital Representation of Geographic Data-Database creation and management-Raster Geographic and Vector data representation-Object oriented Geographic Data representation-Relationship between Data representation and Data Analysis in GIS

Data Quality and Data Standards: Introduction-Concepts and Definitions of Data Quality-Components of Geographic Data Quality-Assessment of Data Quality- Managing Spatial Data Errors-Geographic Data Standards- Geographic Data Standards And GIS Development

Raster and Vector-Based GIS Data Processing: Introduction-Acquiring and Handling Raster Data Processing Cartographic Modeling- Characteristics of Vector- Based GIS Data Processing Vector Data Input Functions Nontopological GIS Analysis Functions Feature-Based Topological Functions Layer-Based Topological Functions Vector-Based Output Functions Application Programming

Visualization of Geographic Information And Generation: Introduction-Cartography in the Context of GIS-Human-Computer Interaction and GIS- Visualization of Geographic Information Principles of Cartographic Design in GIS-Generation of Information Products

Remote Sensing and GIS Integration: Introduction-Principles of Electromagnetic Remote Sensing System Classifications-Imaging Characteristics of Remote Sensing Systems-Extraction of Metric Information from Remotely Sensed Images-Extraction of Thematic Information from Remotely Sensed Images- Integration of Remote Sensing and GIS

Digital Terrain Modeling: Introduction-Definitions and Terminology Approaches to Digital Terrain-Data Sampling- Acquisition of Digital Terrain Data-Data Processing, Analysis, and Visualization-Applications of Digital Terrain Models.

Spatial Analysis and Modeling: Introduction-Descriptive Statistics-Spatial Auto Correlation-Quadrat Counts and Nearest- Neighbor Analysis-Trend Surface Analysis-Gravity Models-Network Analysis-GIS Modeling

GIS Implementation and Project Management: Introduction-Software Engineering as Applied to GIS-GIS Project Planning-Systems Analysis and User Requirements-Geographic Database Design Methodology-GIS Application Software Design Methodology-Systems Implementation and Technology Rollout-Systems Maintenance and Technical Support

GIS Issues and Prospects: Introduction-Issues of Implementing GIS-The Trend of GIS-Development Frontiers of GIS Research.

**Text Book:** Concepts and Techniques of Geographic Information Systems, by C. P. Lo Albert K. W. Yeung, Prentice Hall of India Ltd

MSCSIT 4.2.7

DATA WAREHOUSING LAB

Credits: 2

Instruction: 3 Periods

Univ. Exam : 3 Hours

Sessional Marks: 50

Univ-Exam-Marks:50

Lab Experiments using software like Clementine and Informatica



MSCSIT 4.2.8

SOFTWARE ENGINEERING LAB

Credits:2

Instruction: 3 Periods

Sessional Marks: 50

Univ. Exam : 3 Hours

Univ-Exam-Marks:50

UML and software supporting software engineering  
Software engineering as management, methods and metrics  
Software quality: relation to functional and non-functional attributes  
Software requirements and requirements analysis  
Verification and validation: relation to software quality - Software metrics  
Object-oriented software analysis/design and construction  
UML Requirements Modeling  
Software design and comparison of design methods  
UML Components and Deployment Architectural Levels - The Component Object Model  
Software management: using a process model and improvements using  
Metrics – Cost and Effort Metrics (COCOMO)  
Software reuse: technical and social non-technical issues  
Team Projects illustrating the above materials using IBM Rational Software.

**5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)**

COURSE STRUCTURE AND SCHEME OF EXAMINATION

For

5<sup>th</sup> Year

WITH RESPECT FROM 2010-11 BATCH

I-Semester

Chairman  
Board of Studies

Department of Computer Science & Systems Engineering  
College of Engineering  
Andhra University  
Visakhapatnam

## 5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)

Course Structure and Scheme of Examination  
With Effect from 2009-10 Admitted Batch

### 5<sup>th</sup> year I Semester

Sub. Ref. No.	Name of the Subject	Periods			Max. Marks			
		Theory	Tutorial	Lab	Exam	Sessionals	Total	Credits
MSCSIT 5.1.1	Distributed Operating Systems	3	1		70	30	100	4
MSCSIT 5.1.2	Data Mining	3	1		70	30	100	4
MSCSIT 5.1.3	Embedded Systems	3	1		70	30	100	4
MSCSIT 5.1.4	Elective-III	3	1		70	30	100	4
MSCSIT 5.1.5	Elective-IV	3	1		70	30	100	4
MSCSIT 5.1.6	Seminar	3	1		70	50	100	4
MSCSIT 5.1.7	Data Mining Lab			3	50	50	100	2
MSCSIT 5.1.8	Embedded Systems Lab			3	50	50	100	2
<b>TOTAL</b>							<b>800</b>	<b>24</b>

Elective-III: [1] Middleware Technologies. [2] Information Privacy and Management [3] Knowledge Management [4] Management Principles [5] Cloud Computing

Elective-IV: [1] Bio-Informatics [2] High Performance Computing [3] Multi-core Architectures [4] Pattern Recognition.[5] Soft Computing

MSCSIT 5.1.1                      Distributed Operating Systems                      Credits:4

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

Sessional Marks: 30  
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 Niranjana G.Shivaratna.

MSCSIT 5.1.2

DATA MINING

Credits:4

Instruction: 3 Periods & 1 Tut/week  
30

Sessional Marks:

Univ.-Exam : 3 Hours

Univ-Exam-Marks:70

[1] Introduction What Is Data Mining? Motivating Challenges The Origins of Data Mining Data Mining Tasks Scope Data Types of Data Attributes and Measurement Types of Data Sets Data Quality Measurement and Data Collection Issues

[2] Issues Related to Applications Data Preprocessing Aggregation Sampling Dimensionality Reduction Feature Subset Selection Feature Creation Discretization and Binarization Variable Transformation Measures of Similarity and Dissimilarity Basics Similarity and Dissimilarity between Simple Attributes Dissimilarities between Data Objects similarities between Data Objects Examples of Proximity Measures Issues in Proximity Calculation Selecting the Right Proximity Measure

[3] The Iris Data Set 3.2 Summary Statistics Frequencies and the Mode Percentiles Measures of Location: Mean and Median Measures of Spread: Range and Variance Multivariate Summary Statistics Other Ways to Summarize the Data Visualization Motivations for Visualization General Concepts Techniques Visualizing Higher-Dimensional Data Do's and Don'ts OLAP and Multidimensional Data Analysis Representing Iris Data as a Multidimensional Array Multidimensional Data: The General Case Analyzing Multidimensional Data Final Comments on Multidimensional Data Analysis

[4] Preliminaries General Approach to Solving a Classification Problem Decision Tree Induction 1 How a Decision Tree Works How to Build a Decision Tree Methods for Expressing Attribute Test Conditions Measures for Selecting the Best Split Algorithm for Decision Tree Induction An Example: Web Robot Detection Characteristics of Decision Tree Induction Model Overfitting Overfitting Due to Presence of Noise . Overfitting Due to Lack of Representative Samples . . Overfitting and the Multiple Comparison Procedure Estimation of Generalization Errors Handling Overfitting in Decision Tree Induction Evaluating the Performance of a Classifier Holdout Method Random Subsampling Cross-Validation Bootstrap Methods for Comparing Classifiers Estimating a Confidence Interval for Accuracy Comparing the Performance of Two Models Comparing the Performance of Two Classifiers

[5 ]Classification: Alternative Techniques Rule-Based Classifier How a Rule-Based Classifier Works Rule-Ordering Schemes How to Build a Rule-Based Classifier Direct Methods for Rule Extraction Indirect Methods for Rule Extraction Characteristics of Rule-Based Classifiers Nearest-Neighbor classifiers Algorithm Characteristics of Nearest-Neighbor Classifiers Bayesian Classifiers Bayes Theorem Using the Bayes Theorem for Classification Naïve Bayes Classifier Bayes Error Rate Bayesian Belief Networks Artificial Neural Network (ANN) . Multilayer Artificial Neural Network Characteristics of ANN Support Vector Machine (SVM) Maximum Margin Hyperplanes Linear SVM: Separable Case Linear SVM: Nonseparable Case Nonlinear SVM Characteristics of SVM Ensemble Methods Rationale for Ensemble Method Methods for Constructing an Ensemble Classifier Bias-Variance Decomposition

Bagging Boosting Random Forests Empirical Comparison among Ensemble Methods Class Imbalance Problem Alternative Metrics The Receiver Operating Characteristic Curve Cost-Sensitive Learning Sampling-Based Approaches Multiclass Problem Bibliographic Notes

[6] Association Analysis: Basic Concepts and Algorithms Problem Definition Frequent Itemset Generation The Apriori Principle Frequent Itemset Generation in the Apriori Algorithm Candidate Generation and Pruning Support Counting Computational Complexity Rule Generation Confidence-Based Pruning Rule Generation in Apriori Algorithm An Example: Congressional Voting Records Compact Representation of Frequent Itemsets Maximal Frequent Itemsets Closed Frequent Itemsets Alternative Methods for Generating Frequent Itemsets FP-Growth Algorithm FP-Tree Representation Frequent Itemset Generation in FP-Growth Algorithm Evaluation of Association Patterns Objective Measures of Interestingness Measures beyond Pairs of Binary Variables Simpson's Paradox Effect of Skewed Support Distribution

[7 ] Association Analysis: Advanced Concepts Handling Categorical Attributes Handling Continuous Attributes Discretization-Based Methods Statistics-Based Methods Non-discretization Methods Handling a Concept Hierarchy Sequential Patterns Problem Formulation Sequential Pattern Discovery . Timing Constraints Alternative Counting Schemes Subgraph Patterns Infrequent Patterns

[8] Cluster Analysis: Basic Concepts and Algorithms What Is Cluster Analysis? Different Types of Clusterings Different Types of Clusters K-means The Basic K-means Algorithm K-means: Additional Issues Bisecting K-means K-means and Different Types of Clusters Strengths and Weaknesses K-means as an Optimization Problem Agglomerative Hierarchical Clustering Basic Agglomerative Hierarchical Clustering Algorithm Specific Techniques The Lance-Williams Formula for Cluster Proximity Key Issues in Hierarchical Clustering Strengths and Weaknesses DBSCAN Cluster Evaluation Cluster Analysis: Additional Issues and Algorithms

[10] Anomaly Detection Preliminaries Causes of Anomalies Statistical Approaches Proximity-Based Outlier Detection Density-Based Outlier Detection Clustering-Based Techniques

Text Book: Pang-Ning Tan - Introduction To Data Mining, PEARSON

MSCSIT 5.1.3

EMBEDDED SYSTEMS

Credits:4

Instruction: 3 Periods & 1 Tut/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.

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

MSCSIT 5.1.4 Elective-III

Middleware Technologies

Credits:4

Instruction: 3 Periods & 1 Tut/week

Univ. Exam : 3 Hours

Sessional Marks: 30

Univ-Exam-Marks:70

Peer-to-Peer Computing  
Publish- Subscribe Middleware I  
Adaptability and Context - Awareness  
Publish-Subscribe Middleware II  
Web-Based Middleware  
Component-Based Middleware  
Next Generation Middleware  
Mobile and Ubiquitous Computing

Text Book:

Middleware-2003: By Markus Endler, Douglas C. Schmidt, Springer Publishers



**MSCSIT 5.1.4 Elective-III INFORMATION PRIVACY & MANAGEMENT Credits:4**

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction: Introduction to the topic, Emerging trends of Information Management Evolution of IOD.

Developments in Relational Databases: XML Processing capabilities, PureQuery, Tools for common operations.

Enterprise Content Management: Technologies, strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to an organization and its processes. Introduction to Records Management and Compliance, Categorization of Large volumes of data (Content classification and Search).

Information Integration: Process of information integration, using data abstraction to provide a single interface for viewing all the data within an organization, techniques to arrive at a single set of structures and naming conventions to get a large set of heterogeneous data sources to appear to a user or system as a single, homogeneous data source.

Data Warehousing: Techniques, methods and strategies to retrieve and analyze data, to extract, transform and load data, and to manage the data dictionary for a data warehousing system.

Master Data Management: Overview and concepts for collecting, aggregating, matching, consolidating, quality assuring, persisting and distributing such (Non-Transactional) data to ensure consistency and control in the ongoing maintenance and application use of this information. Introduction to domains, overview of key concepts and benefits of MDM.

Trends in Data Replication: Overview of Replication Methods, Log based replication, Challenges of replication in distributed data environments, Advantages of replication in Disaster recovery and High Availability Processes.

Business Intelligence: Introduction to Business Intelligence and Performance Management. Reporting and Analytics, Concepts, Techniques and Methods to help a business acquire a better understanding of its commercial context. OLAP, analytics, data mining, business performance management, benchmarks, text mining and predictive analytics.

Meta Data Management: Concepts to drive data Lineage from databases to Reporting.

Integrated Data Management: Challenges in data growth management, data privacy compliance, e-discovery, migration to different data repositories.

Applied Intelligence: Real world implementations on Information Integration and Analytics: Threat and Fraud Detection, Usage of RFID technology to track flow of information in a supply chain, Mashups – their relevance in Enterprises.

MSCSIT 5.1.4 Elective- III

KNOWLEDGE MANAGEMENT

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Introduction to knowledge Management: Knowledge value, origins of knowledge 10-step Implementation to knowledge management.

Infrastructure Evaluation and leverage: leveraged infrastructure, aligning KM and Business strategy.

KM system analysis, Design and Development: Knowledge management platform, knowledge audit and analysis, designing the Knowledge team, creating the KM system blue print, developing the KM system

KM System Deployment: Prototyping and deployment, leadership and reward structures Measuring real option analysis for performance, Software tools for Knowledge management.

**Textbook:**“The Knowledge Management Toolkit: Orchestrating IT, Strategy, and knowledge Platforms”, AMRIT TIWANA, Pearson Education., 2005

**Reference Book:** “Knowledge Management: Classic and Complementary Works”, edited by Daryl Morey, Mark Maybury and Bhavani Thuraisingham, University press, 2001

MSCSIT 5.1.4 ELECTIVE- III **MANAGEMENT PRINCIPLES**

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Nature and functions of management: Importance of management – definition of management – management process – Roles of manager –management-- a science or art – management-- a profession.

Planning:Nature of planning – Importance of planning – Types of planning – Steps on planning.

Decision – Making: Meaning of decision – Types of decisions.

Organization : Span of management – principles of organizing – departmentalization.

Authority Delegation and Decentralization : Source of formal authority – difference between authority and power – line and staff authority – delegation of authority – decentralization of authority.

Coordination: Need for coordination – Types of coordination – Techniques of coordination.

Direction:Requirements of effective direction – Motivation.

Importance of communication – Purposes of communication - Formal ommunication - Informal communication – Barriers to communication – Principles of effective Communication.

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.

Managerial control: Steps in a control process – Need for control – Types of control methods – Essentials of Effective control systems.

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.

MSCSIT 5.1.4 ELECTIVE- III CLOUD COMPUTING

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

**Introduction to Cloud computing :**What is Cloud computing, Evolution of software platforms

**Cloud Computing delivery Models:** Public Private & Hybrid Clouds, Cloud based services (Paas, Saas & Iaas)

**Introduction to Open Source cloudsL:** Virtual Computing Lab (Apache VCL), Eucalyptus

**Introduction to Map Reduce:** Simplified data processing on Large clusters, Apache Hadoop

Virtualization: Why Virtualization, Server Virtualization , Storage Virtualization, Clustering Network Virtualisation

MSCSIT 5.1.5 ELECTIVE-IV  
Credits:4

BIO-INFORMATICS

Instruction: 3 Periods & 1 Tut/week  
30

Sessional Marks:

Univ. Exam: 3 Hours

Univ-Exam-Marks:70

Introduction: Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy.

Protein Information Resources: Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.

Genome Information Resources: DNA sequence databases, specialized genomic resources

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.

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.

Multiple sequence alignment: Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching.

Secondary database searching: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

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 Claverie, Cedric Notredame  
WILEY dreamlech India Pvt. Ltd

Reference Books:

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

MSCSIT 5.1.5 ELECTIVE-IV HIGH PERFORMANCE COMPUTING Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Classification of parallel computing structures, instruction level parallelism - static and dynamic pipelining, improving branch performance, superscalar and VLIW processors; High performance memory system; Shared memory multiprocessors and cache coherence; Multiprocessor interconnection networks; Performance modeling; issues in programming multiprocessors; Data parallel architectures.

MSCSIT 5.1.5 Elective- IV

MULTICORE ARCHITECTURE

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

**Multi-core Architecture Segment**

Fundamentals of SuperScalar Processor Design, Introduction to Multicore Architecture – Chip Multiprocessing, homogeneous Vs heterogeneous design - SMP – Multicore Vs Multithreading.

Shared memory architectures– synchronization – Memory organization – Cache Memory – Cache Coherency Protocols - Design of Levels of Caches.

PowerPC architecture – RISC design, PowerPC ISA, PowerPC Memory Management Power 5 Multicore architecture design, Power 6 Architecture.

Cell Broad band engine architecture, PPE (Power Processor Element), SPE (Synergistic processing element), Cell Software Development Kit, Programming for Multicore architecture (introduction).

**Text Book :**

1. Hennessey & Pateterson, “Computer Architecture A Quantitative Approach”, Harcourt Asia, Morgan Kaufmann, 1999 Joseph JaJa.
2. *Introduction to Parallel Algorithms*, Addison-Wesley, 1992.

MSCSIT 5.1.5. ELECTIVE-IV                      PATTERN RECOGNITION                      Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Chapter 1:Introduction

Machine Perception, An Example, Pattern Recognition Systems, The Design Cycle, Learning and Adaptation, Conclusion

Chapter 2: Bayesian Decision Theory: Bayesian Decision Theory-Continuous Features, Classifiers, Discriminant Functions, and Decision Surfaces, The Normal Density

Chapter 3: Maximum-Likelihood and Bayesian Parameter Estimation: Introduction, Maximum-Likelihood Estimation, Bayesian Estimation, Bayesian Parameter Estimation: Gaussian Case, Bayesian Parameter Estimation: General Theory

Chapter 4:Nonparametric Techniques: Introduction, Density Estimation, Parzen Windows,  $k_n$ -Nearest-Neighbour Estimation, The Nearest-Neighbor Rule, Metrics and Nearest-Neighbor Classification.

Chapter 5:Multilayer Neural Networks: Introduction, Feed forward Operation and Classification, Back propagation Algorithm, Back Propagation as Feature Mapping, Backpropagation, Bayes Theory and Probability

Chapter 6:Stochastic Methods: Stochastic Search, Boltzmann Learning

Chapter 7: Unsupervised Learning and Clustering: Introduction, Mixture Densities and Identifiability, Maximum-Likelihood Estimates, Application to Normal Mixtures, Unsupervised Bayesian Learning, Data Description and Clustering, Criterion Functions for Clustering.

Textbooks:

Pattern Classification by Richard O.Duda, Peter E.Hart, David G.Stork



MSCSIT 5.1.5. ELECTIVE-IV SOFT COMPUTING

Credits:4

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

Sessional Marks: 30  
Univ-Exam-Marks:70

Chapter 1 : Introduction to Intelligent Systems And Soft computing

Chapter 2 : Fundamentals of Fuzzy Logic Systems

Chapter 3 : Fuzzy Logic Control

Chapter 4 :Fundamentals of artificial neural networks

Chapter 5 : Major Classes of neural networks

Chapter 6: Dynamic neural networks and their application to control and chaos prediction

Chapter 7: Neuro-Fuzzy Systems

Chapter 8 : Evolutionary and Soft computing

Text Books :

Soft Computing and Intelligent Systems Design, by Fakhreddine O.Karray & Clarence De Silva,  
Pearson education. (Chapters 1 – 8)

**MSCSIT 5.1.7****DATA MINING LAB****Credits: 2**

Instruction: 3 Periods  
Univ. Exam : 3 Hours

Sessional Marks: 50  
Univ-Exam-Marks:50

Lab Experiments using software like Clementine and Informatica for DATAMINING

MCSIT 5.1.8

EMBEDDED SYSTEMS LAB

Credits: 2

Instruction: 3 Periods  
 Univ. Exam : 3 Hours

Sessional Marks: 50  
 Univ-Exam-Marks:50

### I - Cycle

8051 Assembly Language and C-Programming and DSP programming  
 with 8051 based Embedded system + PC, and  
 DSP- $\mu$ P based Embedded System + PC

1.8051 Assembly Language Programming Exercises using 8051 Trainer and Pentium Class PC or VT 70/220 Terminal

2.8051 Assembly Language Programming Exercises using 8051 Trainer, ICE-51 Module, and Pentium Class PC

3.8051 C- programming Exercises with CYGNAL kit C8051F124DK Development Kit or equivalent , Keil C51 C –Compiler, and Pentium Class PC

4.8051 C- programming Exercises with SPJ Systems Board - SBC 51 Single Board Computer Development System or equivalent, IDE 51 C- Compiler, and Pentium Class PC

5.DSP Programming using ADSP 2181 trainer, IDE Visual DSP ++ 3.0 C-Compiler, and Pentium Class PC

6.DSP Programming using ADSP 2181 trainer, IDE Visual DSP ++ 3.0 C-Compiler, EZICE Module and Pentium Class PC

7.DSP Programming using TMS 320C6x Development System, IDE Code Composer Studio- C Compiler, and Pentium Class PC

### II CYCLE

I/O interface and I/O Programming with  
 8051-based System + Pentium Class PC

- 1.Interfacing Toggle Switch and LED Display
- 2.Interfacing 8 x 3 Push Button Keyboard
- 3.Interfacing ASCII Key Board
- 4.Interfacing Hex Key Board and Hex Display
- 5.Interfacing Multiplexed Hex Display
- 6.Interfacing a D.M. Printer
- 7.Interfacing Traffic Light Control Board

**5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)**

COURSE STRUCTURE AND SCHEME OF EXAMINATION

For

5<sup>th</sup> Year

WITH RESPECT FROM 2009-10 BATCH

II-Semester

Chairman  
Board of Studies

Department of Computer Science & Systems Engineering  
College of Engineering  
Andhra University  
Visakhapatnam

**5 year Integrated B.TECH/M.TECH Programme (C.S.I.T)**

**COURSE STRUCTURE AND SCHEME OF EXAMINATION**

**W.E.F 2010-11 ADMITTED BATCH**

**5<sup>th</sup> YEAR 2<sup>nd</sup> Semester - PROJECT WORK**

CODE	NAME OF THE SUBJECT	Credits	PERIODS/WEEK		EVALUATION MAXIMUM MARKS		
			Theory	Lab.	Internal	External	Total
MSCSIT	Project Work		-	-	-	100	100