St. PETER'S UNIVERSITY

St. Peter's Institute of Higher Education and Research
(Declared Under Section 3 of the UGC Act, 1956)
AVADI, CHENNAI – 600 054
TAMIL NADU

M.C.A.
(Code No. – 413, 414, 415)
(**Students Admitted in 2009 – 2010 Batch Only**)
(Distance Education)

Regulations and Syllabi
(I & II & III Year)

St. PETER'S INSTITUTE OF DISTANCE EDUCATION
Recognized by Distance Education Council and
Joint Committee of UGC – AICTE - DEC, New Delhi
(Ref. F. No. DEC/SPU/CHN/TN/Recog/09/14 dated 02.04.2009 and Ref.F.No.DEC/Recog/2009/3169 dated 09.09.2009)

St. Peter's University
St. Peter's Institute of Distance Education
Chennai – 600 054.

Code No. – 413, 414 & 415
M.C.A. PROGRAMME
(Distance Education)

Regulations and Syllabi
(Effective from 2009 – 2010)

1. Eligibility:

(a) Candidates who passed Three Year Undergraduate Programme of the University or any other examination recognized as equivalent thereto with Mathematics at Higher Secondary Level are eligible for admission to Three Year M.C.A. Programme.

(b) Candidates who passed PGDCA / DOEACC Level 'A' / BCA / B.Sc.(IT / Computer Science / Software Engineering / B.E. of the University or any other examination recognized as equivalent thereto are eligible for admission in Second Year (III & IV Semesters) of Three Year M.C.A. Programme.

(c) Candidates who passed M.Sc. (IT / Computer Science / Software Engineering) of the University or any other examination recognized as equivalent thereto are eligible for admission in Third Year (V & VI Semesters) of Three Year M.C.A. Programme.

2. Duration: Three Years Comprising 6 Semesters.

3. Medium: English is the medium of instruction and examination.

4. **Methodology:** The methodology of distance education includes supply of self-instructional study materials in print format and in CD, face-to-face instruction for theory and practicals for a limited period during week ends and on holidays, provision of virtual class in phased manner, dissemination of information over e-mail, Student - Support Service at various Centres of the University, Continuous Continuous Assessment and End Assessment conducted by the University at various parts of India.
5. **Weightage for Continuous and End Assessment:** There is no weightage for Continuous Assessment (CA) unless the ratio is specifically mentioned in the scheme of Examinations. The End Assessment (EA) has 100% weightage.
6. **Credit System:** Credit system be followed with 18 credits for each semester and each credit is equivalent to 25 hours of effective study provided in the Time Table of the formal system.

7. **Scheme of Examinations (for I to VI Semesters)**

I Semester

Code No.	Course Title	Credit		Marks	
	Theory			**EA**	**Total**
109MCT01	Digital Fundamentals and Computer Organization	3		100	100
109MCT02	Problem Solving Techniques	3		100	100
109MCT03	Business Processes	3		100	100
109MCT04	Data Structures	3		100	100
109MCT05	Programming in C	3		100	100
	Practical				
109MCP01	Office Automation Lab Record	1		90 10	100
109MCP02	Data Structures Lab Record	1		90 10	100
109MCP03	Programming in C Lab Record	1		90 10	100
	Total	**18**		**800**	**800**

II Semester

Code No.	Course Title	Credit		Marks	
Theory				**EA**	**Total**
209MCT01	Foundations of Computer Applications	3		100	100
209MCT02	System Software	3		100	100
209MCT03	Design and Analysis of Algorithms	3		100	100
209MCT04	Object Oriented Programming	3		100	100
209MCT05	Database Management Systems	3		100	100
Practical					
209MCP01	Object Oriented Programming Lab Record	1		90 10	100
209MCP02	DBMS Lab Record	1		90 10	100
209MCP03	Algorithms Lab Record	1		90 10	100
	Total	**18**		**800**	**800**

III Semester

Code No.	Course Title	Credit		Marks	
Theory				**EA**	**Total**
309MCT01	Data Communication and Computer Networks	3		100	100
309MCT02	Unix And Network Programming	3		100	100
309MCT03	Micro processor and its Applications	3		100	100
309MCT04	Programming in Java	3		100	100
309MCT05	Advanced Software engineering	3		100	100
Practical					
309MCP01	Micro processor lab Record	1		90 10	100
309MCP02	Programming in Java Lab Record	1		90 10	100
309MCP03	UNIX and Network lab Record	1		90 10	100
	Total	**18**		**800**	**800**

IV Semester

Code No.	Course Title	Credit		Marks	
Theory				**EA**	**Total**
409MCT01	Middleware technologies	3		100	100
409MCT02	Object Oriented System Analysis and Design	3		100	100
409MCT03	Computer Graphics and multimedia Systems	3		100	100
409MCT04	Operating systems	3		100	100
E*	**Elective I** (any one)	3		100	100
409MCP01	Middle ware technologies lab Record	1		90 10	100
409MCP02	Computer Graphics and multimedia lab Record	1		90 10	100
409MCP03	Software Development lab with CASE tools and Testing tools Record	1		90 10	100
	Total	**18**		**800**	**800**

List of Electives For Semester IV

Code No.	Subject Title
409MCT05	Human resource management
409MCT06	ECommerce
409MCT07	ERP

SEMESTER – V

Code No.	Course Title	Credit	Marks	
Theory			**EA**	**Total**
509MCT01	Web Technology	3	100	100
509MCT02	Mobile Computing	3	100	100
509MCT03	Data mining and Data warehousing	4	100	100
509MCT04	C# and Dot Net Technologies	3	100	100
E2***	Elective II	3	100	100
Practical				
509MCP01	Web technology lab Record	1	90 10	100
509MCP02	Dot Net lab Record	1	90 10	100
	Total	**18**	**700**	**700**

LIST OF ELECTIVES FOR SEMESTER V

Code No.	Course Title	Credit	Marks	
Theory			**EA**	**Total**
509MCT05	Free open Source Software	3	100	100
509MCT06	Network management and monitoring	3	100	100
509MCT07	Grid Computing	3	100	100
509MCT08	Image processing	3	100	100

SEMESTER – VI

Code No.	Course Title	Credit	Marks	
Practical			**EA**	**Total**
609MCP01	Project Work	18	100	100
	Total	**18**	**100**	**100**

8. Passing Requirements: The minimum pass mark (raw score) be 50% in End Assessment (EA).

9. Grading System: Grading System on a 10 Point Scale be followed with 1 mark = 0.1 and the conversion of Grade point as given below.

$$\text{Overall Grade Point Average (OGPA)} = \frac{\text{Sum of Weighted Grade Points}}{\text{Total Credits}}$$

$$= \frac{\Sigma\,(EA)C}{\Sigma C}$$

The Overall Grade: The Overall Grade and Classification of all successful candidates be arrived at from the Overall Grade Point Average as stipulated in the following conversion Table.

Grade	Over all Grade Point Average(OGPA)	Over all weighted Average marks	Classification
0	9.0 to 10.0	90 to 100	First Class
A	8.0 to 8.9	80 to 89	First Class
B	7.0 to 7.9	70 to 79	First Class
C	6.0 to 6.9	60 to 69	First Class
D	5.0 to 5.9	50 to 59	Second Class
F	4.0 to 4.9	40 to 49	**Reappearance**

The Grade Sheets of successful candidates provide particulars such as (1) Overall weighted Average Marks, (2) Overall Grade Point Average, (3) Overall Grade and (4) the Overall classification.

10. Pattern of the Question Paper: The question paper for End Assessment will be set for three hours and for the maximum of 100 marks with following divisions and details.

Part A: 10 questions (with equal distribution to all units in the syllabus). Each question carries 2 marks.

Part B: 5 questions with either or type (with equal distribution to all the units in the syllabus). Each question carries 16 marks.

The total marks scored by the candidates will be reduced to the maximum prescribed in the Regulations.

11. Syllabus

I SEMESTER

109MCT01 DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION

UNIT – 1: INTRODUCTION TO DIGITAL DESIGN

Data Representation - Data Types - Complements - Arithmetic Operations - Representations - Fixed Point, Floating Point , Error detection codes - Binary Codes- Logic Gates, Boolean Algebra, Map Simplification - Combinational Circuits: Half-Adder, Full Adder- Flip Flops – Sequential Circuits

UNIT – 2: DIGITAL COMPONENTS - REGISTER TRANSFER & MICRO OPERATIONS

ICs - Decoders - Multiplexers - Registers - Shift Registers - Binary Counters - Memory Unit - Register Transfer Language - Register Transfer - Bus And Memory Transfers - Arithmetic , Logic And Shift Micro Operations , Arithmetic Logic Shift Unit.

UNIT – 3: COMPUTER ORGANIZATION AND PROGRAMMING

Instruction Codes - Computer Registers - Computer Instructions - Timing And Control – Instruction Cycle - Memory Reference Instructions - I/O And Interrupt – Machine Language – Assembly Language - Assembler - Program Loops – Programming Arithmetic and Logic Operations -Subroutines - I/O Programming.

UNIT – 4: INPUT - OUTPUT ORGANIZATION

Peripheral Devices - Input-Output Interface - Asynchronous Data Transfer - Modes Of Transfer - Priority Interrupt - DMA - IOP - Serial Communication.

UNIT – 5: MEMORY ORGANIZATION AND CPU

Memory Hierarchy - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory -Virtual Memory - Memory Management Hardware - CPU: General Register Organization – Control Word - Stack Organization - Instruction Format - Addressing Modes - Data Transfer And Manipulation - Program Control.

REFERENCE BOOKS

1. M. Morris Mano, ”Computer System Architecture”, Prentice Hall of India, 3rd edition, 2003.
2. M. Morris Mano , “Digital Logic & Computer Design” PHI 2006.
3. Alan B. Marcovitz, “Introduction to Logic design”, Tata McGrawHill , Second edition, 2005.

109MCT02 PROBLEM SOLVING TECHNIQUES

UNIT – 1: INTRODUCTION TO COMPUTER PROBLEM-SOLVING

Introduction - The Problem-solving Aspect - Top-down Design-implementation of Algorithms - Program Verification - The Efficiency of Algorithms. Fundamental Algorithms - Exchanging the values of Two Variables - Counting - Summation of a set of Numbers - Factorial Computation-Sine function computation - Generation of the Fibonacci sequence - Reversing the Digits of an Integer - Base Conversion Character to Number Conversion.

UNIT – 2: FACTORING METHODS

Finding the square Root of a number - The Smallest Divisor of an Integer - The Greatest Common Divisor of Two Integers - Generating Prime Numbers - Computing the Prime Factors of an Integer - Generation of Pseudo - random Numbers - Raising a Number to a Large Power - Computing the nth Fibonacci Number.

UNIT – 3: ARRAY TECHNIQUES

Array Order Reversal-Array Counting or Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array – Finding the kth Smallest Element - Longest Monotone Subsequence.

UNIT – 4: SORTING AND SEARCHING

The Two-way Merge - Sorting by Selection - Sorting by Exchange-Sorting by Insertion – Sorting by Diminishing Increment - Sorting by Partitioning - Binary Search - Hash Searching.

UNIT – 5: TEXT PROCESSING AND PATTERN SEARCHING

Text Line Length Adjustment - Left and Right Justification of Text - Keyword Searching in Text-Text Line editing - Linear Pattern Search - Sub linear Pattern Search.

REFERENCE BOOKS

1. R.G. Dromey, "How to Solve it by Computer ", Pearson Education, India, 2007.
2. Seymour Lipschutz, "Essentials computer Mathematics", Schaums' outlines series, Tata McGrawHill Edition, 2004.

109MCT03 BUSINESS PROCESSES

UNIT – 1: INTRODUCTION

Organizational behaviour- Foundations of Individual behavior-Perception and Individual decision making-values, attitude and job satisfaction.

UNIT – 2: GROUPS IN ORGANISATION

Foundations of group behaviour- Understanding work teams- Communication - Leadership.

UNIT – 3: ORGANISATION SYSTEM

Foundations of organization structure - Technology - Work design and stress - Human resource policies and practices - Organisational Culture.

UNIT – 4: BUSINESS PROCESS RE-ENGINEERING AND IT

Basic concepts and the need for BPR-Principles of BPR and the role of IT-BPR and restructuring the organization.

UNIT – 5: NETWORK ORGANIZATIONS

Networked organization- virtual corporations.

REFERENCE BOOKS

1. R. Radhakrishnan and S.Balasubramanian "Buisness Process Reengineering: Text Cases", PHI, 2008.
2. Stephen P. Robbins "Organizational behavior", PHI, 12th edition, 2006.
3. Turban, Mclean, Wetherbe, "Information Technology for management" John Wiely and Sons, 2001.
4. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2000.
5. Vikram Sethi & William R King, "Organizational transformation through business process reengineering", Pearson education, 2006.

109MCT04 DATA STRUCTURES

UNIT – 1: LISTS, STACKS AND QUEUE

Abstract data types- List ADT-Stack ADT-recursion-Queue ADT

UNIT – 2: TREES

Trees - General, Binary trees- Search tree ADT- Binary Search Trees- AVL trees, Threaded trees- Splay Trees- B-Trees.

UNIT - 3 SORTING AND SEARCHING

Sorting - Internal Sorting - Quick Sort, Heap Sort, Radix Sort - External Sorting - Merge Sort, Multi-way Merge Sort, Polyphase Sorting- Basic Search Techniques - Tree Searching – General Search Trees - Hashing.

UNIT - 4 GRAPHS AND THEIR APPLICATIONS

Graphs - Definitions - Topological sort- Shortest Path Algorithms - Network flow problems - Minimum Spanning Tree - Applications of Depth First search - Introduction to NP-completeness.

UNIT - 5 STORAGE MANAGEMENT

Automatic list Management- Garbage Collection - Algorithms for Garbage collection collection and compaction- Dynamic memory management- Buddy Systems.

REFERENCE BOOKS

1. Weiss "Data Structures and Algorithm Analysis in C", Addison Wesley, Second Edition, 2007.
2. Aaron M. Tanaenbaum, Yedidyah Langsam, Moshe J. Augenstein "Data Structures using C" , Prentice hall of India, 2007.
3. Seymour Lipschutz, "Data Structures" Schaums' outline series, Tata McGraw Hill, NewDelhi, 2007.

109MCT05 PROGRAMMING IN 'C'

UNIT – 1: INTRODUCTION TO C LANGUAGE

Overview of 'C'language - Constants, Variables and Data Types - Operators, Expressions and Assignment statements - Managing Input/Output Operations - Formatted I/O - Decision Making - Branching - IF, Nested IF - Switch - goto - Looping- While, do, for statements.

UNIT – 2: ARRAYS AND FUNCTIONS

Arrays - dynamic and multi-dimensional arrays - Character arrays and Strings - String handling Functions - User defined Functions - Categories of Functions - Recursion.

UNIT – 3: STRUCTURES AND UNIONS

Basics of Structures-Declaring a Structure - Array of Structures -Passing Structures elements to Functions- Passing entire Structure to Function - Structures within Structures - Union - Union of Structures - Enumerated Data Types – typed of Statement.

UNIT – 4: POINTERS

Pointers - Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

UNIT – 5: FILE MANAGEMENT

File Management in C - Data hierarchy- Files and Streams - Sequential access file- Random access file – Preprocessors

REFERENCE BOOKS

1. E. Balagurusamy "Programming in ANSI C" , Tata McGraw Hill, 2004.
2. Yashavant P. Kanetkar , "Understanding Pointers In C", BPB Publications, NewDelhi, 2002.
3. Byron C Gottried, Programming with C, Schuams' outline series, 2nd edition, Tata McGraw Hill, 2006.

PRACTICALS

109MCP01: OFFICE AUTOMATION LAB

LIST OF EXPERIMENTS

WORD

1. Creating and Formatting a simple document (using bulleted and Numbered list, adding Headers, Footers and Page numbers)
2. Navigating Long document with the Document Map
3. Working with Tables (create tables, editing tables, formatting tables, converting tables, sorting table contents, etc.,)
4. Mail Merge
5. Creating a Birthday Card

EXCEL

6. Formatting the worksheets (Formatting the cell, rows and columns)
7. Working with functions and formulae.
8. Presenting Data with Charts
9. Performing What-If analysis with data table.
10. Summarize the data using pivot table

POWER POINT

11. Presentation using Text with animation
12. Presentation using images, media file
13. Creating a graph in a PowerPoint slides
14. Creating self running presentations
15. Hiding and showing the slides

ACCESS

16. Creating a database (create a table, setting field properties and setting the key)
17. Entering and editing data using forms
18. Retrieving data from more than one related table using queries (using Query Wizard)
19. Generating Report using Report Wizards.

PRACTICALS

109MCP02 DATA STRUCTURES LABORATORY

LIST OF EXPERIMENTS

1. Create a Stack and do the following operations using arrays and linked lists
   (i)Push (ii) Pop (iii) Peep
2. Create a Queue and do the following operations using arrays and linked lists
   (i)Add (ii) Remove
3. Implement the operations on singly linked list, doubly linked list and circular linked list.
4. Create a binary search tree and do the following traversals
   (i)In-order (ii) Pre order (iii) Post order
5. Implement the following operations on a binary search tree.
   (i) Insert a node (ii) Delete a node
6. Sort the given list of numbers using heap and quick sort.
7. Perform the following operations in a given graph
   (i) Depth first search (ii) Breadth first search
8. Find the shortest path in a given graph using Dijkstra algorithm

PRACTICALS

109MCP03: PROGRAMMING IN 'C' LAB

LIST OF EXPERIMENTS

1. Display the following:
   (i) Floyd's triangle (ii) Pascal Triangle
2. Generate the following series of numbers:
   (i) Armstrong numbers between 1 to 100
   (ii) Prime numbers between 1 to 50
   (iii) Fibonacci series up to N numbers
3. Manipulate the strings with following operations.
   (i) Concatenating two strings (ii) Reversing the string
   (iv) Replacing a string (v) Finding length of the string
4. Find the summation of the following series:
   (i) Sine (ii) Cosine (iii) Exponential
   (iii) Finding the substring
5. Create the sales report for M sales persons and N products using two dimensional array.
6. Simulate following Banking operations using functions.
   (i)Deposit (ii) Withdrawal (iii) Balance Enquiry
7. Implement using recursion
   (i) Find the solution of Towers of Hanoi problem using recursion.
   (ii) Fibonacci number generation.
   (iii) Factorial
8. Generate Student mark sheets using structures.
9. Create a collection of books using arrays of structures and do the following: Search a book with title and author name (ii) Sorts the books on title.
10. Perform string operations using pointers.
11. Program to implement dynamic memory allocation.
12. Create, Reading and displaying a sequential and random access file.

II SEMESTER

209MCT01: FOUNDATIONS OF COMPUTER APPLICATIONS

UNIT – 1: PROBABILITY

Probability models-Sample space-Events-Algebra of Events-Graphical Methods of representing events-Probability Axioms-Combinational Problems-Conditional Probability-Independence of Events-Baye's Rule-Bernoulli Trials

UNIT – 2: SOLUTION OF NON-LINEAR AND SIMULTANEOUS LINEAR EQUATION

Method of Bisection-Method of false position-Fixed point iteration method-Newton's method. Gauss method-Gauss Jordan method-Triangularization method-Jecobi method-Gauss Seidal method.

UNIT – 3: SCHEDULING BY PERT AND CPM

Network construction-Critical path method-project evaluation and review technique- resource analysis in network scheduling

UNIT – 4: QUEUING MODELS

Characterization of Queuing models - Poisson Queues - (M/M/1): (FIFO/¥/¥),(M/M/1): (FIFO/N/¥) , (M/M/C): (FIFO/¥/¥) , (M/M/C): (FIFO/N/¥) models.

UNIT – 5: FORMAL LANGUAGES & FINITE AUTOMATA

Formal Languages: Four classes of grammars (Phrase Structure, context sensitive, context free, regular)-Finite State Automata- Non-Deterministic Finite State Automata (NFSA), conversion of NDFSA to DFSA- acceptance of regular set by an FSA- construction of a right linear grammar from a finite automata.

REFERENCE BOOKS

1. Kishore. S, Trivedi, "Probability and statistics with reliability, queuing and computer Science applications, PHI Edition, 2000, (UNIT-1).
2. Kandasamy. P, Thilagavathy. K and Gunavathi. K, "Numerical methods (revised edition) S. Chand company, New Delhi, 2003, (UNIT 2).
3. Taha H.A., "Operations Research: An Introduction "7th Edition, Pearson Education, 2004. (UNIT-3, 4).
4. Hopcroft and Ullman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, Delhi, 2002. (Unit 5).

209MCT02: SYSTEM SOFTWARE

UNIT – 1: INTRODUCTION

Basic concepts - Machine structure - Simplified Instructional Computer.

UNIT – 2: ASSEMBLERS

Functions - Machine dependent and Machine independent assembler Features - Design options - Implementation - Example - MASM Assembler

UNIT – 3: LOADERS AND LINKERS

Functions - Machine dependent and Machine independent loader features - Design options - Implementation - Example - MSDOS Linker.

UNIT – 4: MACRO PROCESSORS

Functions - M/C independent macro processor features - Macro processor design options - Implementation - Example - MASM Macro processor

UNIT – 5: COMPILERS AND UTILITIES

Introduction to compilers - Different phases of compiler - System software tools - Text editors - Interactive debugging systems.

REFERENCE BOOKS

1. Leland L. Beck, System Software - An Introduction to Systems Programming, 3rd Edition, Addison Wesley, 1999.
2. D.M. Dhamdhere, System Programming and Operating Systems, Tata McGraw Hill Company, 1993.
3. A.U. Aho, Ravi Sethi and J.D. Ullman, Compilers Principles Techniques and Tools, Addison Wesley, 1988.
4. John J. Donovan, systems Programming, Tata McGraw Hill Edition,1991.

209MCT03: DESIGN AND ANALYSIS OF ALGORITHMS

UNIT – 1: INTRODUCTION

Introduction - Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types - Fundamentals of the analysis of algorithm efficiency - analysis frame work - Asymptotic notations - Mathematical analysis for recursive and non-recursive algorithms.

UNIT – 2: DIVIDE AND CONQUER METHOD AND GREEDY METHOD

Divide and conquer methodology - Merge sort - Quick sort - Binary search - Binary tree traversal - Multiplication of large integers - Strassen's matrix multiplication – Greedy method - Prim's algorithm - Kruskal's algorithm - Dijkstra's algorithm.

UNIT – 3: DYNAMIC PROGRAMMING

Computing a binomial coefficient - Warshall's and Floyd' algorithm - Optimal binary search tree - Knapsack problem - Memory functions.

UNIT – 4: BACKTRACKING AND BRANCH AND BOUND

Backtracking - N-Queens problem - Hamiltonian circuit problem - Subset sum problem – Branch and bound - Assignment problem - Knapsack problem Traveling salesman problem.

UNIT – 5: NP-HARD AND NP-COMPLETE PROBLEMS

P & NP problems - NP-complete problems - Approximation algorithms for NP-hard problems - Traveling salesman problem - Knapsack problem.

REFERENCE BOOKS

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms" Pearson Education, 2003.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, "Introduction to algorithms", Prentice Hall, 1990.
3. SaraBaase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson education, 2003.
4. A.V. Aho, J.E Hopenfit and J.D. Ullman, "The Design and Analysis of Computer algorithms", Pearson education Asia, 2003.

209MCT04: OBJECT ORIENTED PROGRAMMING

UNIT – 1: OOP PARADIGAM

Programming Paradigms-Procedural Programming-Modularity-Exception Handling Data Abstraction-User Defined Types-Concrete Types-Abstract Types-Virtual Functions-Object Oriented Programming-Generic Programming-Containers Algorithms.

UNIT – 2: INTRODUCTION TO C++

Overview of C++-Classes and Objects- constructor and destructor – Friend Functions – Friend Classes- Inline Function – Static Members – Arrays – Pointers - References-Dynamic Allocation.

UNIT – 3: OVERLOADING

Function Overloading-Overloading Constructor Functions-Copy Constructors-Default Argument- Operator Overloading-Member Operator Overloading-Overloading new and delete.

UNIT – 4: INHERITANCE AND TEMPLATES

Inheritance-Base Class-Access Control-Virtual Functions-Pure Virtual Functions Templates-Generic Functions-Applying Generic Functions-Generic Classes

UNIT – 5: ERROR HANDLING AND FILES

Exception Handling-C++ I/O Streams-File I/O-STL-Overview-Container Classes Lists-Maps - Algorithms Using Functions and Objects-String Class.

REFERENCE BOOKS

1. Herbert Schildt, ”C++ The Complete Reference”, Tata McGraw-Hill Edition, 2003 (unit 2, 3, 4).
2. Bjanne Stroustrup,”The C++ Programming Language”, 3rd Edition, Addison Wesley, 2000, (Unit 1 & 5).
3. Robert Lafore.”Waite Groups OOP in Turbo C++”,Galgotia Publications, 2001.
4. Stanley, B. Lippman, Jove Lagrie, ”C++Primer”,3rd Edition, Addison Wesley, 1998.

209MCT05 DATA BASE MANAGEMENT SYSTEMS

UNIT – 1: INTRODUCTION

Database Systems vs. File Systems-View of Data- Data Models-Database Languages-Transaction Management-Database Systems Structure-History of Database Systems-Database Systems Applications-Entity Relationship Model

UNIT – 2: RELATIONAL DATABASES

SQL-Basic Structure-Set Operations-Complex Queries-Joined Queries-DDLEmbedded SQLDynamic SQL-Other SQL Functions-Query by Example-Integrity and Security of searching- Relational Database Design - Normalization - 1NF,2NF,BCNF,3NF

UNIT – 3: DATA STORAGE AND INDEXING

Storage & File Structure-Disks-RAID-File Organization-Indexing &Hashing-B+ TREE-B Tree - Static Hashing-Dynamic Hashing-Multiple Key Access

UNIT – 4: QUERY EVALUATION & OPTIMIZATION

Query Processing-Selection Operation-Sorting-Join Operation-Evaluation of Expressions-Query Optimization

UNIT – 5: TRANSACTION MANAGEMENT & RECENT TRENDS

Transaction Concept-Static Implementation-Concurrency Control-Protocols Deadlock Handling- Recovery Systems-Recovery with Concurrent Transactions Shadow Paging-Buffer Management - Basic concepts: Distributed Databases, Parallel Databases.

REFERENCE BOOKS

1. Abraham Silberschatz, Hentry F. Korth and S. Sudharssan, ”Database System Concepts”, 4th Edition, Tata McGraw Hill, 2002.
2. Raghu Ramakrishnan & Johannesgerhrke, ”Data Base Management Systems”, McGraw Hill International Edition, 2000.
3. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.

PRACTICALS

209MCP01: OBJECT ORIENTED PROGRAMMING LAB

LIST OF EXPERIMENTS

1. Programs using Constructor and Destructor.
2. Creation of classes and use of different types of functions.
3. Count the number of objects created for a class using static member function.
4. Write programs using function overloading and operator overloading.
5. Programs using inheritance.
6. Program using friend functions.
7. Program using virtual function.
8. Write a program using exception handling mechanism.
9. Programs using files.
10. Programs using function templates

PRACTICALS

209MCP02: DATABASE MANAGEMENT SYSTEMS LAB

LIST OF EXPERIMENTS

1. Execute a single line and group functions for a table.
2. Execute DCL and TCL Commands.
3. Create and manipulate various DB objects for a table.
4. Create views, partitions and locks for a particular DB.
5. Write PL/SQL procedure for an application using exception handling.
6. Write PL/SQL procedure for an application using cursors.
7. Write a DBMS program to prepare reports for an application using functions.
8. Write a PL/SQL block for transaction operations of a typical application using triggers.
9. Write a PL/SQL block for transaction operations of a typical application using package.
10. Design and develop an application using any front end and back end tool (make use of ER diagram and DFD).
    (Typical Applications - Banking, Electricity Billing, Library Operation, Pay roll, Insurance, Inventory, etc.)

PRACTICALS

209MCP03: ALGORITHMS LAB

LIST OF EXPERIMENTS

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Strassen's matrix multiplication using divide and conquer method.
3. Solve the knapsack problem using greedy method.
4. Construct a minimum spanning tree using greedy method.
5. Construct optimal binary search trees using dynamic programming method of problem solving.
6. Find the solution for traveling salesperson problem using dynamic programming approach.
7. Perform graph traversals.
8. Implement the 8-Queens Problem using backtracking.
9. Implement knapsack problem using backtracking.
10. Find the solution of traveling salesperson problem using branch and bound technique.

309MCT01: DATA COMMUNICATION AND COMPUTER NETWORKS

UNIT – 1:

Data communication-components-protocols and standards –like configuration-topologies-Transmission mode-Categories of network-OSI model-TCP/IP protocol Model –Application Protocol and TCP/IP utilities –Error detection and correction.

UNIT – 2:

Encoding and Decoding techniques-Transmission media- Performance –Channelization-FDMA-TDMA-CDMA- Peer to peer protocol and TCP/IP utilities-ARQ protocols-Other adaptation function-Data link controls

UNIT – 3:

LAN standards- Ethernet and IEEE802.3 LAN standards-Token Ring and IEEE802.5 Standards –FDDI- Wireless LAN and IEEE 802.11 Standards-LAN bridges –Packet Network Topology-Routing and packet networks-Shortest path algorithm

UNIT – 4:

ATM network –Traffic Management and QOS –Congestion Control-TCP/IP architecture-The internet protocols-Ivp6-UDP-TCP-DHCP and mobile IP –internet Routing protocol-Multicasting routing

UNIT – 5:

Advance network architecture-IP forwarding Architecture-Overlay Models-MPLS-RVSP-Differentiated services –Security Protocols -Security and Cryptographic Algorithm-Security Protocols Cryptography Algorithms

REFERENCE BOOKS:

1. Communication Network- Fundamental Concepts and key Architecture BY Leon Garcia and Widjaja.
2. Data Communication and Networking Behrouz A. Forouzan –Second Edition.

309MCT02: UNIX AND NETWORK PROGRAMMING

1. INTRODUCTION & FILE SYSTEM

Overview of UNIX OS - File I/O – File Descriptors – File sharing - Files and directories – File types - File access permissions – File systems – Symbolic links - Standard I/O library – Streams and file objects – Buffering - System data files and information - Password file – Group file – Login accounting – system identification.

2. PROCESSES

Environment of a UNIX process – Process termination – command line arguments - Process control – Process identifiers - Process relationships terminal logins – Signals -threads.

3. INTERPROCESS COMMUNICATION

Introduction - Message passing (SVR4)- pipes – FIFO – message queues - Synchronization (SVR4) – Mutexes – condition variables – read – write locks – file locking – record locking – semaphores –Shared memory(SVR4).

4. SOCKETS

Introduction – transport layer – socket introduction - TCP sockets – UDP sockets - raw sockets – Socket options - I/O multiplexing - Name and address conversions.

5. APPLICATIONS

Debugging techniques - TCP echo client server - UDP echo client server - Ping - Trace route - Client server applications like file transfer and chat.

TEXT BOOKS

1. W. Richard Stevens, Advanced programming in the UNIX environment, Addison Wesley, 1999. (Unit 1,2 &3).
2. W. Stevens, Bill Fenner, Andrew Rudoff, "Unix Network Programming", Volume 1, The Sockets Networking API,3rd Edition, Pearson education, Nov 2003. (unit 4 & 5).

REFERENCE BOOKS

1. Meeta Gandhi, Tilak Shetty and Rajiv Shah – The 'C' Odyssey Unix –The open Boundless C ,1st Edition, BPB Publications, 1992.

309MCT03: MICROPROCESSOR AND ITS APPLCATONS

UNIT – 1:

Basic Concepts: Microprocessor, Microcomputer - Registers and Instruction Memory Addressing Architecture - Internal Architecture of 8085, Z80 and Motorola. **Introduction to 8086 Processor:** 8086 Processor-Introduction, 8086 architecture, Pin configuration, 8086 in min/max mode, Addressing modes, Instruction set of 8086, Assembler directives, Assembly language programming.

UNIT – 2:

Peripherals & Interfacing With 8086: Serial & parallel I/O (8251A and 8255), Programmable interval timer 8253, Programmable DMA controller 8257, programmable interrupt controller 8259A, Keyboard and display controller 8279, ADC / DAC interfacing.

UNIT – 3:

80286 Processor: Features of 80286, internal architecture of 80286, real addressing mode, virtual addressing mode, privilege, protection, basic bus operation of 80286, fetch cycles of 80286.

UNIT – 4:

80386 and 80486 Processor: Features of 80386Dx, internal architecture of 80386Dx, pin configuration of 80386, register organization of 80386Dx, features of 80486, register organization of 80486.

UNIT – 5:

Advance In Microprocessors: Features of Pentium processor, Pentium – I, Pentium – II, Pentium – III, Pentium – IV, Introduction to microcontroller 8051, architecture of 8051, Register set of 8051.

TEXT BOOK:

1. A.K. Ray and K.M. Bhurchandi, "Advanced Microprocessors and Peripherals", First Edition, Tata McGraw Hill, 2000.

REFERENCE BOOKS:

1. Douglas V. Hall, "Microprocessors and Interfacing Programming and Hardware". Tata McGraw Hill, 1999.
2. Goankar, "Microprocessor Architecture Programming and Applications with 8085", Wiley Eastern, 2000.

309MCT04: PROGRAMMING IN JAVA

UNIT – 1:

Introduction to Java - Features of Java - Object Oriented Concepts - Lexical Issues – Data Types - Variables - Arrays Operators - Control Statements.

UNIT – 2:

Classes - Objects - Constructors - Overloading method ass Control - Static and fixed methods - Inner Classes - String Class - Inheritance - Overriding methods - Using super-Abstract class.

UNIT – 3:

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws.

UNIT – 4:

The Java Thread Model- Creating a Thread and Multiple Threads - Thread Priorites-Synchronization--Inter thread Communication - Deadlock - Suspending, Resuming and stopping threads - Multithreading.

UNIT – 5:

I/O Streams - File Streams - Applets - String Objects - String Buffer - Char Array

REFERENCE BOOKS:

1. Patrick Naughton and Herbert Schildt- JAVA 2 (The Complete Reference), Third Edition-TMH - 1999.
2. K. Arnold and J. Gosling - The Java Programming Language - Second Edition - Sun Microsystems-1999

309MCT05: ADVANCED SOFTWARE ENGINEERING

UNIT 1: INTRODUCTION

A Generic View Of Processes – Process Maturity – Process Models – Agile Process And Models – Software Cost Estimation –Risk Analysis – Software Project Planning & Scheduling.

UNIT 2: REQUIREMENT ANALYSIS

System Engineering Hierarchy – Requirement Engineering: Tasks, Initiating The Process, Eliciting Requirements, Developing Use Cases – Negotiating Requirements – Validating Requirements – Building The Analysis Models: Concepts – Object Oriented Analysis – Scenario Based Modeling – Data & Control Flow Oriented Model – Class Based Model – Behavioral Model.

UNIT 3: SOFTWARE DESIGN

Design Concepts – Design Models – Pattern Based Design – Architectural Design – Component Level Design – Class Based And Conventional Components Design – Real-time System Design - User Interface : Analysis And Design.

UNIT 4: SOFTWARE TESTING

Software Testing – Strategies – Issues – Test Strategies For Conventional And Object Oriented Software – Validation And System Testing - Testing Tactics: White Box Testing, Basis Path Testing – Control Structure Testing – Black Box Testing - Object Oriented Testing – Testing GUI – Testing Client/Server – Test Documentation.

Study of testing tools for function testing, performance testing, load testing, web testing, web services testing - load runner, win runner, Qengine webload, silk performer, rational.etc

UNIT 5: SOFTWARE QUALITY ASSURANCE

Software Quality Concepts – Quality Assurance – Software Technical Reviews – Formal Approach To Software Quality Assurance - Reliability – Quality Standards – Software Quality Assurance Plan – Software Maintenance - Software Configuration Management –

TEXTBOOKS

1. Roger S. Pressman., Software Engineering: A Practitioner's Approach (Sixth Edition), McGraw Hill, 2005.
2. I. Sommerville, Software Engineering, V Edition: Addison Wesley, 1996.

REFERNCES

1. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
2. James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000**.**
3. Fairely, "Software Engineering Concepts", McGraw Hill, 1995.

309MCP01: MICRO PROCESSOR LAB

1. Study Experiments
   i) Study of 8086 Architecture
   ii) Study of 8255 – PPI
   iii) Study of 8253 – PIT
   iv) Study of 8279 – PKI
   v) Study of 8259 – PIC

2. Write an ALP to find out factorial of a given hexadecimal number using 8086 MP
   Data: OAH, OFH, 1OH

3. Write an ALP to perform 16 bit arithmetic operations (ADD, SUB, MUL, DIV)

4. Write an ALP to generate the sum of first 'N' natural numbers using 8086 MP

5. Write an ALP to convert given hexadecimal number to binary using 8086 MP
   Data: ABH, CDH, 101H

6. Write an ALP to convert given binary number to hexadecimal number using 8086 MP
   Data: 10101010_2, 11111111_2, 1100_2, 1111_2

7. Write an ALP to order give set of hexadecimal numbers in ascending and descending order
   Data: 0AH, 0FH, 0DH, 10H, 02H

8. Write an ALP to move block of data from locations 1200H-1205H to 2200H – 2205H

9. Write an ALP to reverse the given string
   Data: WELCOME

10. Write an ALP to generate the following series $1+1/x+1/x^3+1/x^5+$ ……..

309MCP02: PROGRAMMING IN JAVA LAB

1. Finding area and Perimeter of a circle. Use Buffered Reader class.
2. Substring Removal from a String. Use String Buffer Class.
3. Generate the Random numbers using random ( ) method and Random Class.
4. String Manipulation using Char Array.
5. Usage of Vector Classes.
6. Application using Inheritance.
7. Application using Abstract class
8. Application using Interface.
9. Application using Package.
10. Implementing Thread based applications & Exception Handling.

APPLETS

11. Working with Frames and various controls.
12. Working with Dialogs and Menus.
13. Working with Panel and Layout.
14. Incorporating Graphics.
15. Working with Colors and Font

309MCP03: UNIX AND NETWORK PROGRAMMING LAB

1. Program using basic network commands
2. Program using system calls : create, open, read, write, close, stat, fstat, lseek
3. Program to implement inter process communication using pipes
4. Program to perform inter process communication using message queues
5. Program to perform inter process communication using shared memory
6. Program to perform synchronization using semaphores
7. Program to capture packets : sniffer
8. Program using TCP sockets (Client and Server)
9. Program using UDP sockets (Client and Server)
10. Program using URL class to download webpages

IV SEMESTER

409MCT01: MIDDLEWARE TECHNOLOGIES

1. CLIENT / SERVER CONCEPTS

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

2. EJB ARCHITECTURE

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

3. EJB APPLICATIONS

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

4. CORBA

CORBA – Distributed Systems – Purpose - Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB - Building an application with CORBA.

5. COM

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation, Invocation , Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling - Remoting.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002. (Unit 1)
2. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.(Unit 2 & 3)
3. Jason Pritchard, "COM and CORBA side by side", Addison Wesley,2000 (Unit 4 & 5)
4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002. (Unit 5)

REFERNCES

1. Mowbray, "Inside CORBA", Pearson Education, 2002.
2. Jeremy Rosenberger, "Teach yourself CORBA in 14 days", Tec media, 2000.

409MCT02: OBJECT ORIENTED SYSTEM DESIGN

1. OBJECT ORIENTED DESIGN FUNDAMENTALS

The Object Model – Classes And Objects - Complexity Of Software – Classification – Notation – Process – Pragmatics – Binary And Entity Relationship – Object Types – Object State – OOSD Life Cycle.

2. OBJECT ORIENTED METHODOLOGIES AND UML

Object Oriented Methodology: Rumbaugh, Booch, Jacobson, Shaler/Mellor, Coad/Yardon – Patterns – Frame Works – The Unified Approach – UML

3. OBJECT ORIENTED ANALYSIS

Identify Use Cases – Use Case Model – Documentation – Classification – Identifying Classes – Noun Phrases Approach – Common Class Pattern Approach – Use Case Driven Approach – Identifying Object Relationship, Attributes And Models.

4. OBJECT ORIENTED DESIGN

Design Process – Design Axioms – Designing Classes – Access Layer Design – View Layer Design.

5. MANAGING OBJECT ORIENTED DEVELOPMENT

Managing Analysis And Design – Evaluation Testing – Coding – Maintenance – Metrics – Case Study: Foundation Class Library – Client/Server Computing.

REFERENCES:

1. Ali Bahrami, Object Oriented System Development, McGraw Hill International Edition, 1999.
2. Larman, Applying UML & Patterns: An Introduction to Object Oriented Analysis and Design, Pearson Education, 2nd Edition, 2003.
3. Bernd Bruegge, Allen H. Dutoit, "Object Oriented Software Engineering using UML, Patterns and Java", Pearson Education 2nd Edition 2004.

409MCT03: COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

UNIT I: INTRODUCTION

Overview of Graphics System - Bresenham technique – Line Drawing and Circle Drawing Algorithms - DDA - Line Clipping - Text Clipping.

UNIT 2: 2D TRANSFORMATIONS

Two dimensional transformations – Scaling and Rotations - Interactive Input methods - Polygons - Splines – Bezier Curves - Window view port mapping transformation.

UNIT 3: 3D TRANSFORMATIONS

3D Concepts - Projections – Parallel Projection - Perspective Projection – Visible Surface Detection Methods - Visualization and polygon rendering – Color models – XYZ-RGB-YIQ-CMY-HSV Models - animation – Key Frame systems - General animation functions - morphing.

UNIT 4: OVERVIEW OF MULTIMEDIA

Multimedia hardware & software - Components of multimedia – Text, Image – Graphics – Audio – Video – Animation – Authoring.

UNIT 5: MULTIMEDIA SYSTEMS AND APPLICATIONS

Multimedia communication systems – Data base systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – video on demand

TEXT BOOKS

1. Hearn D and Baker M.P, "Computer graphics – C Version", 2nd Edition, Pearson Education, 2004, (unit 1, 2 &3).
2. Ralf Steinmetz, Klara steinmetz, "Multimedia Computing, Communications and Applications", Pearson education, 2004(unit 4 & 5).

REFERENCES

1. Siamon J. Gibbs and Dionysios C. Tsichritzis, "Multimedia programming", Addison Wesley, 1995.
2. John Villamil, Casanova and Leony Fernanadez, Eliar, "Multimedia Graphics", PHI, 1998.

409MCT04: OPERATING SYSTEMS

UNIT 1: INTRODUCTION

Main frame Systems, Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time systems – Hand held Systems, Operating Systems Structures: System Components – Operating System Services - System calls - System Programs – System Design and Implementation - CPU scheduling: Basic Concepts – Scheduling Algorithms.

UNIT 2: PROCESS MANAGEMENT

Process Concepts - Process Scheduling - Operation on Process - Co-Operating process - Inter Process Communication - Threads: Multithreading Models - Process Synchronization: The Critical Section Problem – Synchronization Hardware - Semaphores – classical problem of Synchronization – Monitors - Deadlock: Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention – Deadlock Avoidance - Deadlock Detection – Recovery from Deadlock.

UNIT 3: MEMORY MANAGEMENT

Background – Swapping - Contiguous Memory Allocation - Paging - Segmentation – Segmentation with paging - Virtual Memory: Demand paging - Page Replacement - Thrashing.

UNIT 4: FILE SYSTEMS

File Concepts - Access methods - Directory Structure - File Protection - File System Implementation: File System Structure and Implementation – Directory Implementation – Allocation methods Free Space Management – Recovery - Disk Structure – Disk Scheduling.

UNIT 5: OVERVIEW OF LINUX

LINUX- The operating System; Compiling the Kernel; Introduction to the Kernel: Important data structures, Main algorithms, Implementing System Calls. LINUX Architecture-independent memory model, Virtual address space for a process, Block device caching, Pages under LINUX.

TEXTBOOKS

1. Silberschatz, Galvin, Gagne "Operating System Concepts", Sixth Edition, 2003.
2. Pradeep K. Sinha, "Distributed OS concepts and Design", IEEE computer Society Press, PHI 1998.
3. M. Bek et al: LINUX Kernel Internals, Addison-Wesley, 1997.

REFERENCES

1. Andrew S. Tanenbaum , "Modern Operating Systems", PHI , 2nd Edition 2001.
2. Achut S. Godbole and Kahate Atul, "Operating Systems & Systems Programming", Tata McGraw Hill, 2003.
3. Charles Crowley, "Operating systems: A Design Oriented Approach", Tata McGraw Hill, 1999.

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409MCP01: MIDDLEWARE TECHNOLOGIES LAB

1. Create a distributed application to download various files from various servers using RMI
2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK
3. Develop an Enterprise Java Bean for Banking operations
4. Develop an Enterprise Java Bean for Library operations
5. Create an Active-X control for File operations
6. Develop a component for converting the currency values using COM / .NET
7. Develop a component for encryption and decryption using COM / .NET
8. Develop a component for retrieving information from message box using DCOM / .NET
9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA
10. Develop a middleware component for retrieving Weather Forecast information using CORBA

409MCP02: COMPUTER GRAPHICS AND MULTIMEDIA LAB

1. Write a C program with Fundamental Graphics Function

2. Write a C program for Line drawing using Bresenham, DDA Line Drawing Algorithms.

3. Write a C program for Circle Drawing using Bresenham Circle Drawing Algorithms.

4. Write a C program for Clipping Algorithm using Line Clipping.

5. Write a C program for 2D Transformations like Translations and Scaling and Rotations.

6. Write a C program for 3D Transformations like Translations and Scaling and Rotations.

7. Create Frame by Frame Animations using multimedia authoring tools.

8. Develop a presentation for a product using techniques like Guide Layer, masking and onion Skin using authoring tools.

9. Create a Jpeg image which demonstrates the various features of an image editing tool.
10. Demonstrate Rasterization and filtering of layers and give blending effects for a logo.

409MCP03: Software Development lab with CASE tools and Testing tools

Familiarization of features of any one of the standard UML case tool.

1. Capturing key functional requirements as Use cases and class diagram for online ticket / hotel reservation systems, student information system, sales and marketing system, banking system and inventory tracking system.
2. Interacting diagrams, state chart diagrams etc for systems in 2.
3. Implementation using any one of object oriented languages like Java, C++ for systems in 2.
4. Component diagrams, deployment diagrams for system in 2.
5. Apply any one of the tasting tools for all systems in 2.

409MCT05: HUMAN RESOURCE MANAGEMENT

1. LEADERSHIP

Technical Leadership - Leader's Goal, Conviction, Vision - Transformational and Transactional Leadership - Leader's Vision - Professionalism : Importance, Elements - Managing Awareness - Performance - Manager's Role in Professionalism.

2. MANAGING TECHNICAL AND PROFESSIONAL PEOPLE

Goals of Engineers and Scientists - Work Assignment - Need for Influence - Professional Career and Goals - Age and Creativity - Performance - Motivation - Employee Partnership - Career Risks - Technical Competence - Professional Discipline - Manager's Role in Professional Discipline - Guidelines.

3. IDENTIFICATION AND DEVELOPMENT OF TALENTED PEOPLE

Talented Professionals – Importance - Characterization - Identification – Assessment and Recognizing Talent - Development - Development Needs - Counseling.

4. INNOVATION

The Importance of Innovation - Risk of Failure - Nature of Creativity - Imagination - Managing Innovative Teams - Needs of Creative Teams - Team Dynamics - A Software Development Example - Manager's Responsibility - Team's Personal Needs - Political versus Technical Solutions - Team Synergism.

5. TEAM ENVIRONMENT AND RECOGNITION

Innovative Team Environment -Award Programs - Recognition Programs - An Example Award Plan - Industry Award Plans - Award Guidelines - Incentive Plans - A Caution on Recognition Programs

TEXT BOOKS

1. Watts S. Humphrey, "Managing Technical People: Innovation, Teamwork, and the Software Process", Addison-Wesley, 1996.

REFERENCES

1. Biswajeet Pattanayak, "Human Resource Management", Prentice Hall of India, 2002.
2. K. Aswathappa, Human Resource and Personnel Management text and cases, Tata McGraw Hill publishing Co. Ltd., 2002.

409MCT06: E COMMERCE

1. INTRODUCTION

Networks and Commercial Transactions - Internet and Other Novelties - Electronic Transactions Today - Commercial Transactions - Establishing Trust - Internet Environment - Internet Advantage - World Wide Web.

2. SECURITY TECHNOLOGIES

Why Internet Is Unsecure - Internet Security Holes - Cryptography : Objective - Codes and Ciphers - Breaking Encryption Schemes - Data Encryption Standard - Trusted Key Distribution and Verification - Cryptographic Applications - Encryption - Digital Signature - Nonrepudiation and Message Integrity.

3. ELECTRONIC PAYMENT METHODS

Traditional Transactions : Updating - Offline and Online Transactions - Secure Web Servers - Required Facilities - Digital Currencies and Payment Systems - Protocols for the Public Transport - Security Protocols - SET - Credit Card Business Basics.

4. ELECTRONIC COMMERCE PROVIDERS

Online Commerce Options - Functions and Features - Payment Systems : Electronic, Digital and Virtual Internet Payment System - Account Setup and Costs - Virtual Transaction Process - InfoHaus - Security Considerations – Cyber Cash: Model - Security - Customer Protection - Client Application - Selling through Cyber Cash.

5. ONLINE COMMERCE ENVIRONMENTS

Servers and Commercial Environments - Payment Methods - Server Market Orientation - Netscape Commerce Server - Microsoft Internet Servers - Digital Currencies - DigiCash - Using Ecash - Ecash Client Software and Implementation - Smart Cards - The Chip - Electronic Data Interchange - Internet Strategies, Techniques and Tools.

TEXT BOOKS

1. Pete Loshin, "Electronic Commerce", 4th Edition, Firewall media, An imprint of laxmi publications Pvt. Ltd., New Delhi, 2004.

REFERENCES

1. Jeffrey F.Rayport and Bernard J. Jaworski, "Introduction to E-Commerce", 2nd Edition, Tata Mc-Graw Hill Pvt., Ltd., 2003.
2. Greenstein, "Electronic Commerce", Tata McGraw Hill Pvt., Ltd., 2000.

409MCT07 - ENTERPRISE RESOURCE PLANNING – (ERP)

1. INTRODUCTION TO ERP

Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On–line Analytical Processing – Supply Chain Management.

2. ERP IMPLEMENTATION

Implementation Life Cycle – Implementation Methodology – Hidden Costs – Organizing Implementation – Vendors, Consultants and Users – Contracts – Project Management and Monitoring.

3. BUSINESS MODULES

Business Modules in an ERP Package – Finance – Manufacturing – Human Resource – Plant Maintanance – Materials Management – Quality Management – Sales and Distribution.

4. ERP MARKET

ERP Market Place – SAP AG – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates.

5. ERP – PRESENT AND FUTURE

Turbo Charge the ERP System – EIA – ERP and E–Commerce – ERP and Internet – Future Directions in ERP.

REFERENCES:

1. Alexis Leon, "ERP Demystified", Tata McGraw Hill, 1999.
2. Joseph A. Brady, Ellen F. Monk, Bret J. Wangner, "Concepts in Enterprise Resource Planning" , Thomson Learning, 2001.
3. Vinod Kumar Garg and N.K .Venkata Krishnan, "Enterprise Resource Planning – concepts and Planning", Prentice Hall, 1998.
4. Jose Antonio Fernandz, " The SAP R /3 Hand book", Tata McGraw Hill

V SEMESTER
509MCT01 – WEB TECHNLOGY

1. INTRODUCTION:

Role of XML – XML and the Web – XML Language Basics – SOAP – Web services – Revolutions of XML – Service Oriented Architecture (SOA) – SOAP – Overview of SOAP – HTTP – XML – RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns and Faults – SOAP with attachments.

2. XML TECHNOLOGY:

XML – Name Spaces – Structuring with schemes and DTD – Presentation Techniques – Transformation – XML Infrastructure.

3. INTRODUCTION TO PEARL:

Introduction to Perl Interpolation Context Operators File/Directory Access Built-In Functions Command Line Arguments Control Structures External Programs Regular Expressions More Regular Expressions More Built-In functions References Subroutines Object – Oriented Programming More Object – Oriented Programming Perl/TK (GUI with Perl).

4. INTRODUCTION PYTHON:

Python Review – Idiomatic Data Handling – Classes and Objects – Inside the Python Object Model – Iterators, Generators, Coroutines – Functional Programming.

5. WEB SERVICES:

Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML – SOAP and Web Services in E-Com – Overview of .Net and J2EE.

Text Books:

1. Frank. P. Coyle, XML, Web Services and the Data Revolution, Pearson Education, 2002.

Reference Books:

1. Rames Nagappan, Robert Skoczylas and Rima Patel Sriganesh, "Developing Java Web Services", Wiley Publishing Inc., 2004.
2. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers, 2005.
4. Python Essential Reference (4th Edition) David M. Beazley.
5. Erric Hermann Mastering PEARL.

509MCT02 - MOBILE COMPUTING

1. INTRODUCTION

Medium Access Control : Motivation for Specialized MAC- SDMA- FDMA- TDMA- CDMA- Comparison of Access mechanisms – Tele communications : GSM- DECT- TETRA – UMTS- IMT-200 – Satellite Systems: Basics- Routing- Localization- Handover- Broadcast Systems: Overview – Cyclic Repetition of Data- Digital Audio Broadcasting – Digital Video Broadcasting

2. WIRELESS NETWORKS

Wireless LAN: Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks- IEEE 802.11 – HIPERLAN – Bluetooth- Wireless ATM: Working Group- Services- Reference Model – Functions – Radio Access Layer – Handover- Location Management- Addressing Mobile Quality of Service- Access Point Control Protocol

3. MOBILE NETWORK LAYER

Mobile IP : Goals – Assumptions and Requirement – Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP- Ad hoc Networks

4. MOBILE TRANSPORT LAYER

Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing – Selective Retransmission- Transaction Oriented TCP

5. WAP

Architecture – Datagram Protocol- Transport Layer Security- Transaction Protocol- Session Protocol- Application Environment-Wireless Telephony Application

TEXT BOOKS:

1. J.Schiller, Mobile Communication, Addison Wesley, 2000.

REFERENCE BOOKS:

1. William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.
2. William Stallings, Wireless Communication and Networks, Pearson Education, 2003.
3. Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.

509MCT03 DATA WAREHOUSING AND DATA MINING

UNIT - 1. INTRODUCTION

Relation To Statistics, Databases- Data Mining Functionalities-Steps In Data Mining Process-Architecture Of A Typical Data Mining Systems- Classification Of Data Mining Systems - Overview Of Data Mining Techniques.

UNIT - 2. DATA PREPROCESSING AND ASSOCIATION RULES

Data Preprocessing-Data Cleaning, Integration, Transformation, Reduction, Discretization Concept Hierarchies-Concept Description: Data Generalization And Summarization Based Characterization- Mining Association Rules In Large Databases.

UNIT - 3. PREDICTIVE MODELING

Classification And Prediction: Issues Regarding Classification And Prediction-Classification By Decision Tree Induction-Bayesian Classification-Other Classification Methods-Prediction-Clusters Analysis: Types Of Data In Cluster Analysis- Categorization Of Major Clustering Methods: Partitioning Methods – Hierarchical Methods

UNIT - 4. DATA WAREHOUSING

Data Warehousing Components -Multi Dimensional Data Model- Data Warehouse Architecture-Data Warehouse Implementation- -Mapping the Data Warehouse to Multiprocessor Architecture- OLAP.-Need- Categorization of OLAP Tools.

UNIT - 5. APPLICATIONS

Applications of Data Mining-Social Impacts Of Data Mining-Tools-An Introduction To DB Miner-Case Studies-Mining WWW-Mining Text Database-Mining Spatial Databases.

TEXT BOOKS:

1.Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2002.

REFERENCES:

1. Alex Berson,Stephen J. Smith, “Data Warehousing, Data Mining,& OLAP”, Tata Mcgraw- Hill, 2004.
2. Usama M.Fayyad, Gregory Piatetsky - Shapiro, Padhrai Smyth And Ramasamy Uthurusamy, "Advances In Knowledge Discovery And Data Mining", The M.I.T Press, 1996.
3. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 1998.
4. Sean Kelly, "Data Warehousing In Action", John Wiley & Sons Inc., 1997.

509MCT04 C# AND DOT NET PROGRAMMING

UNIT 1 – INTRODUCTION

Introduction to C# - understanding .Net – Overview of C# -Literals, variables, data types, operators, expressions, branching, looping, methods, arrays, strings, structures, enumerations

UNIT 2 – OBJECT ORIENTED ASPECT OF C#

Classes – objects- inheritance – poly morphism – interfaces – operator overloading- delegates- events- errors and exceptions

UNIT 3 – APPLICATION DEVELOPMENT ON .NET

Building Windows applications- accessing data with ADO.Net

UNIT 4 – WEB BASED APPLICATION DEVELOPMENT ON .NET

Programming web applications with web form, programming web services

UNIT5 – CLR AND THE .NET FRAMEWORK

Assemblies – versioning – attributes – reflection – viewing meta data – type discovery – reflecting on a type – marshalling – remoting – understanding server object types- specifying a server with an interface – building a server – building the client using single call – threads.

TEXT BOOK

1. E.Balagurusamy 'Programming in C# " Tata Mcgraw Hill – 2004 edition(Unit 1,2)
J. Liberty 'Programming C#' 2nd edition O'Reilly-2002(Unit3, 4, 5)

REFERENCES

1. Herbert Schildt –"The Complete Reference C#' Tata Mcgraw Hill – 2004 edition(Unit 1,2)
2. Andrew Troelson 'C# and .Net platform'A! Press, 2003.

PRACTICAL

509MCP01 - WEB TECHNOLOGIES LAB

1. Create an XML document to store an address book.
2. Create an XML document to store information about books and create the DTD files.
3. Create an XML schema for the book's XML document from exercise 2.
4. Create an XML document to store resumes for a job web site and create the DTD file
5. Present the book's XML document using cascading style sheets (CSS).
6. Write an XSLT program to extract book titles, authors, publications, book rating from the book's XML document and use formatting.
7. Use Microsoft DOM to navigate and extract information from the book's XML document.
8. Use Microsoft DSO to connect HTML form or VB form to the book's XML document and display the information.
9. Create a web service for temperature conversion with appropriate client program.(use PEARL)
10. Create a web service for currency conversion (at five currencies) with appropriate client program.(use PYTHON)

509MCP02 – .NET LAB

C# programs

1.Develop a convention table of Fahrenheit to Celsius .

2.Write a C# program to display date and time using class

3. Write a program which uses inheritance

4.Write a program to demonstrate Exception

5.Create a ADO.net application for database.

.Net lab

6. Create a simple windows Form using .Net

7.Design an Analog Clock drawn on GDI

8.Design a ASP.Net web Form Calculator

9. Design a ASP.Net web Form Calendar

10Creare a Smart Quotation Web Application

509MCT05 – FREE OPEN SOURCE SOFTWARE

1. UNIT-1 INTRODUCTION

Overview of Free/Open Source Software-Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends andPotential-global and Indian.GNU/Linux OS installation-detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files,editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ;Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

2. UNIT –2 CONFIGURING ADDITIONAL HARDWARE

Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux --accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Windowsystem configuration and utilities - configure X windows, detect display devices ; Installing software from source code as well as using binary packages. Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers - using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services - using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid (http / ftp / httpsproxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)

3. UNIT-3 SETTING UP A FIREWALL

Setting up a firewall - Using net filter and ip tables; Using the GNU Compiler Collection –GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems - constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools - using CVS to manage source code revisions, patch & diff.

4. UNIT- 4 FOSS LIBRARIES

Understanding the GNU Libc libraries and linker - linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed& awk scripting. Basics of the X Windows server architecture.

5. UNIT-5 FOSS PROGRAMMING

Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localization support.

Text Book :

1. Introduction to Linux: Installation and Programming N. B. Venkateshwarlu (Ed); B S
Publishers; 2005. (An NRCFOSS Publication)

Reference Books :

2. Running Linux, Fourth Edition, Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and
Lar Kaufman, O'Reilly Publishers, December 2002, ISBN: 0-596-00272-6.

3. Linux Cookbook, First Edition, Carla Schroder, O'Reilly Cookbooks Series, November 2004,
ISBN: 0-596-00640-3.

On-line materials

1. Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN:
1-56592-582-3. URL: http://www.oreilly.com/catalog/opensources/book/toc.html

2. The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz,
2001. URL: http://dsl.org/cookbook/cookbook_toc.html

3. The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and
Alex Weeks, December 2003. URL: http://www.tldp.org/guides.html

4. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html

5. An Introduction to GCC, Brian Gough. URL: http://www.network-theory.co.uk/docs/gccintro/

6. GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian
Lance Taylor. URL: http://sources.redhat.com/autobook/

7. Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL:
http://cvsbook.red-bean.com/

8. Advanced Bash Scripting Guide, Mendel Cooper, June 2005.
URL: http://www.tldp.org/guides.html

509MCT06 – NETWORK MANAGEMENT AND ADMINISTRATION

UNIT I-INTROUCTION

Network services – Names and Addresses – The Host Table – DNS – Mail services – File and Print servers – configuration servers – summary - Getting started – connected and Non-connected Networks – Basic information – planning Routing – Planning Naming Service – Other services – Informing the Users – summary - Basic Configuration - Kernel – configuration – Using Dynamically Loadable Modules – Recompiling the Kernel – Linux Kernel configuration – Startup Files – The Internet Daemon – The Extended Internet Daemon.

UNIT II- CONFIGURING THE INTERFACE

Configuring the Interface – The ifconfig command – TCP / IP over a Serial Line – Installing PPP - Configuring Routing – common routing configuration – The minimal routing table – Building a static routing table – configuring DNS – BIND : Unix name service – configuring the Resolver – configuring named – using ns lookup

UNIT III- NETWORK SERVICES

Local Network Services – the Network File system – Sharing Unix printers – using samba to share resources with windows – Network Information – service – DHCP – Managing Distributed servers – Post office servers – send mail – sendmail's function – running sendmail as a Daemon – Sendmail Aliases – Modifying a sendmail of File – Testing Sendmail.

UNIT IV- CONFIGURING OF SERVERS

Configuring Apache – Installing Apache software – configuring the Apache server – understanding an Lttpd. Conf File – Web server security - Managing your web server – Network Security – Security planning – user Authentication – Application security – Security Monitoring – Access control – Encryption – Firewalls.

UNIT V- TROUBLE SHOOTING

Trouble shooting TCP / IP Applications a problem – Diagnostic Tools – Testing Basic connectivity – Troubleshooting Network Access – Checking Routing – Checking Name Service – Analyzing Protocol problems – Protocol case study - Applications : Internet Management – Introduction – The level of Management Protocols – Architectural Model – Protocal Framework – Examples of MIB variables – The structure of Management Information – Formal Definitions using ASN 1 – Structure and Representation of MIB object names – Simple Network Management Protocol – SNMP message format – Example encoded SNMP message – New features in SNMPv3 - Summary.

TEXT BOOK

1. Craig Hunt, "TCP / IP Network Administration", 3rd Edition, O'Reilly Networking, 2002.
2. Douglas E Comer, "Internetworking with TCP / IP – Principles, Protocols and Architectures", Fourth Edition, Prentice – Hall of India Pvt. Ltd., 2002.

REFERENCES

1. Steven Graham, Steve Shah, "LINUX Administration A beginner's Guide", 3rd Edition, McGraw Hill, 2002.
2. Nicholas wells, "Guide to Linux Installation and administration", Vikas Publishing house, 2000.
3. Red Hat, "Official Red Hat Linux 8 Administrator's Guide", Wiley – Dreamtech India Pvt. Ltd., 2002.
4. Steve Maxwell, "UNIX system Administration, A beginner's Guide", Tata McGraw Hill Edition, 2002.

509MCT07 - GRID COMPUTING

UNIT I- GRID COMPUTING

Introduction-Definition and Scope of grid computing

UNIT II - GRID COMPUTING INITIALIVES

Grid Computing Organizations and their roles – Grid Computing analog – Grid Computing road map.

UNIT III - GRID COMPUTING APPLICATIONS

Merging the Grid sources – Architecture with the Web Devices Architecture.

UNIT IV - TECHNOLOGIES

OGSA – Sample use cases – OGSA platform components – OGSI – OGSA Basic Services.

UNIT V -GRID COMPUTING TOOL KITS

Globus GT 3 Toolkit – Architecture, Programming model, High level services – OGSI .Net **-**middleware Solutions.

TEXTBOOK

1.Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson/PHI PTR-2003.

REFERENCE BOOK

1.Ahmar Abbas, "Grid Computing: A Practical Guide to technology and Applications", Charles River media – 2003.

509MCT08 - DIGITAL IMAGE PROCESSING

UNIT - 1. DIGITAL IMAGE FUNDAMENTALS

Image formation, Image transforms – Fourier transforms, Walsh, Hadamard, Discrete cosine, Hotelling transforms.

UNIT - 2. IMAGE ENHANCEMENT & RESTORATION

Histogram modification techniques - Image smoothening - Image Sharpening - Image Restoration - Degradation Model – Noise models - Spatial filtering – Frequency domain filtering.

UNIT - 3. IMAGE COMPRESSION & SEGMENTATION

Compression Models - Elements of information theory - Error free Compression - Image segmentation –Detection of discontinuities - Edge linking and boundary detection - Thresholding – Region based segmentation - Morphology.

UNIT - 4. REPRESENTATION AND DESCRIPTION

Representation schemes- Boundary descriptors- Regional descriptors - Relational Descriptors

UNIT - 5. OBJECT RECOGNITION AND INTERPRETATION

Patterns and pattern classes - Decision-Theoretic methods - Structural methods.

TEXTBOOK:

1. Gonzalez.R.C & Woods. R.E., Digital Image Processing, II Ed., Pearson Education, 2002.

REFERENCES:

1. Anil Jain.K, Fundamentals of Digital image Processing, Prentice Hall of India, 1989.
2. Sid Ahmed, Image Processing, McGraw Hill, New York, 1995.