

GOBI ARTS & SCIENCE COLLEGE (AUTONOMOUS) : GOBICHETTIPALAYAM

SCHEME OF EXAMINATIONS - M.C.A. (COMPUTER APPLICATIONS) (15 BATCH)

No.	Code	Subject Title	Hrs	CIA	E0SE	Total	Credit
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SEMESTER : 1							
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1	11P3CA01	PROGRAMMING IN C & C++	3	30	70	100	3.5
2	14P3CA02	DATA STRUCTURES	3	30	70	100	3.5
3	14P3CA03	NUMERICAL & STATISTICAL METHODS	3	30	70	100	3.5
4	11P3CA04	DIGITAL PRINCIPLES & APPLICATIONS	3	30	70	100	3.5
5	11P3CA05	OBJECT ORIENTED ANALYSIS & DESIGN	3	30	70	100	3.5
6	11P3CAPA	PROGRAMMING LAB - I (DATA STRUCTURES IN C)	3	30	70	100	3.0
7	11P3CAPB	PROGRAMMING LAB - II (NUMERICAL AND STATISTICAL METHODS IN C++)	3	30	70	100	3.0
SEMESTER : 2							
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8	11P3CA06	JAVA PROGRAMMING	3	30	70	100	3.5
9	14P3CA07	RELATIONAL DATABASE MANAGEMENT SYSTEM	3	30	70	100	3.5
10	11P3C051	ACCOUNTING AND FINANCIAL MANAGEMENT	3	30	70	100	3.5
11	11P3CA08	MATHEMATICAL FUNDAMENTALS OF COMPUTER SCIENCE	3	30	70	100	3.5
12	11P3CA09	ELECTIVE:I VISUAL PROGRAMMING	3	30	70	100	4.0
13	11P3CAPC	PROGRAMMING LAB - III (JAVA)	3	30	70	100	3.0
14	11P3CAPD	PROGRAMMING LAB - IV (RDBMS)	3	30	70	100	3.0
SEMESTER : 3							
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15	11P3CA10	J2EE	3	30	70	100	3.5
16	11P3CA11	CLIENT/SERVER COMPUTING	3	30	70	100	3.5
17	11P3CA12	DESIGN AND ANALYSIS OF ALGORITHMS	3	30	70	100	3.5
18	11P3CA13	ELECTIVE:II SYSTEM PROGRAMMING AND OPERATING SYSTEMS	3	30	70	100	4.0
19	11P3CAPE	PROGRAMMING LAB - V (J2EE)	3	30	70	100	3.0
20	11P3CAPF	PROGRAMMING LAB - VI (CLIENT/SERVER)	3	30	70	100	3.0
21	11P3CAV1	MINI PROJECT - I		30	70	100	2.5
22		SUPPORTIVE PAPER	3	30	70	100	4.0

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SEMESTER : 4

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| 23 | 11P3CA14 | .NET PROGRAMMING | 3 | 30 | 70 | 100 | 3.5 |
| 24 | 11P3CA15 | GRAPHICS & MULTIMEDIA | 3 | 30 | 70 | 100 | 3.5 |
| 25 | 14P3CA16 | MICROPROCESSORS AND ASSEMBLY LANGUAGE PROGRAMMING | 3 | 30 | 70 | 100 | 3.5 |
| 26 | 11P3CA17 | SOFTWARE ENGINEERING AND QUALITY ASSURANCE | 3 | 30 | 70 | 100 | 3.5 |
| 27 | 11P3CA18 | ELECTIVE - III PRINCIPLES OF COMPILER DESIGN | 3 | 30 | 70 | 100 | 4.0 |
| 28 | 11P3CAPG | PROGRAMMING LAB - VII (.NET) | 3 | 30 | 70 | 100 | 3.0 |
| 29 | 11P3CAPH | PROGRAMMING LAB - VIII (GRAPHICS) | 3 | 30 | 70 | 100 | 3.0 |

SEMESTER : 5

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30	11P3CA19	SOFTWARE PROJECT MANAGEMENT & TESTING	3	30	70	100	3.5
31	15P3CA20	XML & WEB SERVICES	3	30	70	100	3.5
32	11P3CA21	MOBILE COMMUNICATION	3	30	70	100	3.5
33	11P3CA22	DATA WAREHOUSING & MINING	3	30	70	100	3.5
34	11P3CA23	ELECTIVE - IV TCP/IP PROTOCOL SUITE	3	30	70	100	4.0
35	11P3CAPI	PROGRAMMING LAB - IX (SOFTWARE TESTING)	3	30	70	100	3.0
36	11P3CAPJ	PROGRAMMING LAB - X (XML & WEB SERVICES)	3	30	70	100	3.0
37	11P3CAV2	MINI PROJECT - II		30	70	100	2.5

SEMESTER : 6

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| 38 | 11P3CAV3 | PROJECT REPORT & VIVA - VOCE | | 30 | 70 | 100 | 15.0 |
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TOTAL CREDIT : 140

MCA - I SEMESTER

PROGRAMMING IN C AND C++

Instructional Hrs: 60

- Objectives: 1. To understand and use the basic programming concepts of C/C++.
2. Manipulate various C/C++ data types, such as arrays strings and pointers.
3. To write medium scale C/C++ programs using the above skills.

UNIT - I **12Hrs**

Introduction: Overview of C - Constants, Variables & Data types – Operators & Expressions - Managing input and output operations - Decision Making & Branching - Decision making & Looping - Arrays - Simple Programs.

UNIT - II **12Hrs**

Characters Arrays & Strings - User defined functions - Structures & Unions - Programs.

UNIT - III **12Hrs**

Pointers - File Management in C - The Preprocessor - Programs.

UNIT - IV **12Hrs**

Basic concepts of OOP - Benefits of OOP - Applications of OOP – Class and Objects: Specifying a Class - defining member functions - Nesting of member functions - Private member functions - Arrays within a class - Static member functions - Array of objects - object as function arguments - returning objects - Constructors and Destructors: Introduction - Constructors- Constructors - Dynamic Constructor - Destructors.

UNIT - V **12Hrs**

Operator Overloading: Overloading Unary, Binary operators - Rules for overloading operators - Inheritance - Virtual functions & Polymorphism- Managing console I/O Operations - Exception handling.

Text Books:

[1] Programming in ANSIC - E.Balagurusamy, Tata McGraw Hill Publications. Third Edition (UNITS I.II.III)

[2] Object Oriented Programming with C++ - E.Balagurusamy, Tata McGraw Hill companies, Fourth Edition (UNITS IV, V)

Reference Books:

[1] The C Programming Language - Kernighan, B.W & Ritchie, D.M. Prentice Hall of India

[2] Mastering C++ - K.R. Venugopal, Rajkumar, T. Ravishankar, Tata McGraw Hill Publishing company ltd.

MCA - SEMESTER I

DATA STRUCTURES

Instructional Hrs: 60

Objective: Understanding various types of Data structures, representation and operations.

UNIT I

12 Hours

Introduction-Basic Terminology; Elementary Data Organization-Data Structures-Data Structure Operations-Algorithms: Complexity, Time - Space Trade off- Linear Arrays-Representation of Linear Array-Traversing Linear Arrays-Inserting and Deleting-Sorting; Bubble Sort-Searching; Linear Search-Binary Search-Multidimensional Arrays- Sparse Matrix.

UNIT II

12 Hours

Linked lists: Introduction- Representation of Linked lists in Memory-Traversing a Linked list-Searching a Linked list-Memory Allocation; Garbage Collection-Insertion into a Linked list-Deletion from a Linked list-Header Linked lists-Two Way Lists.

UNIT III

12 Hours

Stacks: Introduction-Array Representation of Stacks-Linked Representation of Stacks-Arithmetic Expressions; Polish Notation-Quick Sort an Application of Stacks-Queues-Linked Representation Of Queues-Deque-Priority Queues.

UNIT IV

12 Hours

Trees: Introduction-Binary Trees-Representing Binary Trees In Memory-Traversing Binary Trees-Traversal Algorithms using Stacks-Header Nodes; Threads-Binary Search Trees-Searching and Inserting in Binary Search Trees-Deleting In a Binary Search Tree-B Trees.

UNIT V

12 Hours

Graphs: Introduction-Graph theory terminology- Sequential Representation of Graphs; Adjacency Matrix; Path Matrix-Warshall's Algorithm; Shortest Paths-Linked Representation of Graph-Operations on Graphs-Traversing a Graph.

TEXT BOOK:

Data Structures, Seymour Lipschutz, G A Vijayalakshmi Pai Schaum's Outlines, Reprint 2007, *Tata McGraw- Hill Publishing Company Limited, New Delhi.*

REFERENCE BOOK:

Fundamental of Data Structure, Ellis Horowitz, Sartaj Sahni, Galgotia Book Source.

**MCA - SEMESTER I
NUMERICAL AND STATISTICAL METHODS**

Instructional Hrs: 60

- Objectives: 1.To improve numerical ability.
2. To improve logical ability by applying Numerical formula.
3. To understand the various types of measures and statistical methods.

UNIT-I **12 Hours**

Algebraic and Transcendental Equations: Bisection, False Position, Newton Raphson methods – Polynomial equation, Solving Polynomial equation – Solutions of Simultaneous Linear Equations; Gauss Elimination method, Gauss Jogobi method - Gauss Seidal Method.

UNIT-II **12 Hours**

Numerical Integration: Trapezoidal Rule - Simpson's rules – Boole's and Weddle's Rules – Romberg Integration - Euler-Maclaurin Formula..

UNIT- III **12 Hours**

Numerical Solution of Ordinary Differential Equations: Taylor's Series – Picard's method - Euler's method – Runge -Kutta methods second and fourth order – Adam's Predictor Corrector method – Milne's Predictor Corrector method.

UNIT-IV **12 Hours**

Statistics: Definition - **Measures of Central Values:** Mean – Median – Mode - Their Relationship – Geometric mean – Harmonic mean – Problems.

Measures of Dispersion: Range – Mean Deviation – Standard Deviation – Problems.

Skewness, Moments and Kurtosis: Introduction - Measures of Skewness, Moments and Kurtosis – Problems.

UNIT-V **12 Hours**

Correlation: Types – Methods – Karl Pearson's coefficient of correlation – Rank correlation – Spearman's correlation coefficient – Problems.

Regression: Uses – Difference between Correlation and Regression – Regression lines – Regression equations – Problems.

TEXT BOOKS:

1. INTRODUCTORY METHODS OF NUMERICAL ANALYSIS
- S.S.Sastry, Prentice Hall of India. **(UNIT I - III)**
2. STATISTICAL METHODS
- S.P. Gupta, S.Chand & Company Ltd, New Delhi. **(UNIT IV & V)**

REFERENCE BOOKS:

1. NUMERICAL METHODS IN SCIENCE & ENGINEERING
- Dr.M.K.Venkatraman, The National Public Company.
2. NUMERICAL METHODS WITH PROGRAMMING IN C
- T.Veerarajan, T.Ramachandran, Second Edition, TMH, New Delhi.
2. STATISTICS
- R.S.N.Pillai & Bagavathi, S.Chand & Company Ltd, New Delhi.

MCA - SEMESTER I

DIGITAL PRINCIPLES & APPLICATIONS

Instructional Hrs: 60

Objective: To understand the working of the components of a digital system.

UNIT I

12Hrs

Combinational Logic Circuits: Boolean laws & theorems, Sum of products method, truth table to K- map, pairs, quads & octets, Karnaugh simplification, Don't care, Quine - McClusky method.

Data processing circuits: Multiplexers, Demultiplexers, 1 to 16 decoders, BCD to decimal decoder, seven segment decoders, encoders.

UNIT II

12Hrs

Data processing circuits: XOR Gates, parity generators and checkers, Magnitude comparator, ROM, Programmable array logic, Programmable Logic arrays.

Arithmetic Circuits: Binary addition, Binary Subtraction, Unsigned Binary Numbers, Sign - magnitude numbers, 2's complement representation and arithmetic, Arithmetic Building Blocks, Adder - subtractor, Fast adder, ALU, Binary Multiplication & division.

UNIT III

12Hrs

Clocks & Timing Circuits: Clock waveform, TTL clock **FLIP - FLOPS:** RS flip flops, gated flip flops, Edge triggered Rs flip flops, Edge triggered D flip flops, Edge triggered JK flip flop, JK master Slave flip flops.

Registers: Types of registers, SISO, SIPO, PISO, PIPO, Universal Shift register, Ring Counter.

UNIT IV

12Hrs

Design of synchronous sequential circuits: Model selection, state transition diagram, state synthesis table, Design equation & Circuit Diagram, Implementation using ROM.

Asynchronous Sequential Circuit: Analysis of asynchronous sequential circuit, problem with asynchronous sequential circuits, Design of asynchronous sequential circuits.

UNIT V

12Hrs

D/A & A/D conversion: Variable resistor networks, Binary ladders, D/A converters, D/A accuracy & resolution.

A/D Converter: Simultaneous Conversion, Counter method, Continuous A/D Conversion, A/D techniques, Dual slope A/D conversion, Accuracy & resolution.

Memory: Magnetic Memory, Optical Memory, Memory Addressing, ROM, PROM, EPROM, RAM, Sequential Programmable logic device, content addressable Memory

Text Book:

Donald P. Leach, Albert Paul Malvino & Goutam saha, Digital principles & Applications, 7<sup>th</sup> ed McGraw Hill, 2011.

Reference Book:

Morris Mano, Computer system Architecture PHI, 2010.

OBJECT ORIENTED ANALYSIS AND DESIGN

Instructional Hrs: 60

Objectives: 1. To understand and apply object –oriented concepts in application development.

2. Learning of modeling language UML for architecture designing of applications.

UNIT - I **12Hrs**

THE OBJECT MODEL: The Evaluation of the Object Model, Elements of the Object Model, Applying the Object Model.

UNIT - II **12Hrs**

Classes and Objects: The Nature of an Object, Relationships among Objects, The Nature of a Class, Relationships among Classes, The Interplay of Classes and Objects.

UNIT - III **12Hrs**

Classification: The Importance of Proper Classification, Identifying Classes and Objects, Key Abstractions and Mechanisms, **THE PROCESS:** First Principles, the Micro Development Process, the Benefits and Risks of Object Oriented Development.

UNIT - IV **12Hrs**

INTRODUCTION TO MODELING: The importance and principles of Modeling, Object Oriented Modeling, **INTRODUCTION TO UML:** Brief History of UML, An Overview and a Conceptual Model of the UML, **BUILDING BLOCKS OF THE UML:** Things, Relationships, Diagrams, Rules and Common Mechanisms in the UML, Systems Architecture, Class Diagrams, Use Case Diagrams.

UNIT - V **12Hrs**

Object Diagrams, Collaboration Diagrams, Sequence Diagrams, State Chart Diagrams, Activity diagrams, Component Diagrams and Deployment Diagrams. **CASE STUDY:** Modeling of a building access control application.

Text Books:

1. OBJECT - ORIENTED ANALYSIS AND DESIGN WITH APPLICATIONS, GRADY BOOCH, Pearson Education Inc., Dorling Kindersley (India), pvt. Ltd., Second Edition 2006 (UNITS 1 to III)
2. INSTANT UML, PIEERE ALIAN MULLER, Shroff publishers & Distributors, First Indian Reprint, 2000. (UNITS IV & V)

Reference Books:

1. OBJECT - ORIENTED ANALYSIS AND DESIGN, G.Sudha Sadasivam, Mac Millan publisher India Ltd, First Edition, 2010.
2. THE UNIFIED MODELING LANGUAGE USER GUIDE, GREDY BOOCH, JAMES RUMBAUCH, IVAR JACOBSON, Addition Wesley Publication, Second Edition 2000 (UNIT IV)

MCA - SEMESTER II JAVA PROGRAMMING

Instructional Hrs: 60

Objectives: 1. To make the students to understand the strength of Java language from other conventional language.

2. To Teach how it supports to platform independence in a distributed environment.

UNIT - I

12Hrs

AN OVERVIEW OF JAVA: Object oriented programming, Data Types, Variables, Arrays, Operators, Control Statements, Introducing **CLASSES:** class Fundamentals, Introducing Methods, Constructors, this Keyword, Overloading Methods, Overloading Constructors, Using Objects as Parameters, Returning objects, Recursion, Understanding Static, Exploring the String Class.

UNIT - II

12Hrs

INHERITANCE: Inheritance Basics, Using Super, Creating a Multilevel Hierarchy, Method Overriding, Dynamic Method Dispatch, Using Abstract Classes, **PACKAGES AND INTERFACES:** Packages, Access Protection, Interfaces, Exception Handling, Exception Types, Uncaught Exceptions, Using try and Catch, Multiple Catch Clauses, Nested try Statements, throw, throws, finally, Multithreaded Programming, The Java Thread Model, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities.

UNIT - III

12Hrs

THE APPLET CLASS: Applet Basics, An Applet Selection, The HTML Applet Tag, Passing parameters to Applets, get DocumentBase (), getCodeBase (), **EVENT HANDLING:** Event classes, Event Listener Interfaces, Handling Mouse Events, Handling Keyboard Events, Adapter Classes.

UNIT - IV

12Hrs

INTRODUCING THE AWT: AWT Classes, Window Fundamentals, Creating a Frame window in an Applet, Working with Graphics, Working with Color, Working with Fonts, Using AWT Controls, Layout Managers, Menus.

UNIT - V

12Hrs

JAVA BEANS: Advantages of Java Beans, Application Builder Tools, JAR Files, Developing a Simple Bean Using the JDK, Introspection, Using Bound Properties, Using the Bean Info Interface, **DEVELOPING SERVLETS:** The Architecture of Java Servlet, The Basics Servlet Architecture, Generic servlet and Httpservlet, The Life Cycle of a Servlet, Building A Basic Servlet, Basic Servlet, Basic Servlet Structure for Get Requests, A Simple Servlets Generating Plain Text, Compiling and Installing the Servlet,

Running the Servlet, Overview of a Complete Servlets, Architecture of the Servlet packages, Servlet requests and Responses.

Text Books:

1. JAVA2, THE COMPLETE REFERENCE, HERBERT SCHILDT, Tata McGraw Hill Publishing, Edition 2002(UNITS I, IV, V).
2. PROGRAMMING JAVA SERVER PAGES & SERVLET, ER.V.K.Jain, Dreamtech Press, Edition 2000(UNITS V).

MCA - SEMESTER II

RELATIONAL DATABASE MANAGEMENT SYSTEMS

Instructional Hrs: 60

Objectives: 1. Learning of database concepts through relational model.

2. Design and develop an application for storing data with database as the back end.

3. Learning & advanced concepts include concepts; Transaction concurrency control.

UNIT- I

12 Hours

Introduction to Databases - Introduction, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using the DBMS Approach, A Brief History of Database Applications – **Overview Of Database Languages and Architectures** – Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client/Server Architectures for DBMSs, Classification of Database Management Systems.

UNIT-II

12 Hours

Conceptual Data Modeling Using Entities and Relationships – Using High Level Conceptual Data Models for Database Design, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, ER Diagrams Naming Conventions, and Design Issues, Relationship Types of Degree Higher than Two – **Basic Relation Model** – Relation Model Concepts, Relational Model Constraints and Relational Database Schemas.

UNIT-III

12 Hours

SQL: Data Definition, Constraints, and Basic Queries and Updates – SQL Data Definition and Data Types, Specifying Constraints in SQL, Basic Retrieval Queries in SQL, INSERT, DELETE, and UPDATE Statements in SQL – **SQL: Advanced Queries** – Complex SQL Retrieval Queries, View(Virtual Tables) in SQL.

UNIT-IV

12 Hours

Introduction to Normalization Using Functional and Multivalued Dependencies – Informal Design Guidelines for Relation Schemas, Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

UNIT-V

12 Hours

Introduction to Database Security – Introduction to Database Security Issues, Discretionary Access Control Based On Granting and Revoking Privileges, Mandatory Access Control and Role-Based Access Control for Multilevel Security, SQL Injection. –**Foundations of Database Transaction processing** – Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Transaction Support in SQL.

REFERENCE BOOKS:

1. DATABASE SYSTEMS Models, Languages, Design and Application Programming, Ramez Elmarsi, Shamkant B.Navathe, Pearson Education, 6th Edition, 2013 (Units I to V).
2. DATABASE MANAGEMENT SYSTEMS, Raghu Ramakrishna & Johannes Gehrke, McGrawHill, Edition 2000.
3. DATABASE SYSTEMS CONCEPTS DESIGN AND APPLICATIONS, S.K.Singh, Pearson Education, Edition, 2009.

MCA - SEMESTER II

ACCOUNTING AND FINANCIAL MANAGEMENT

Instructional Hrs: 75

Objective: To make the students to understand the basic concepts of Financial, Cost & Management Accounting.

UNIT - I

15Hrs

ACCOUNTING: Meaning - Concepts - Conventions - Functions Objectives - Role of Accountant - Journalising - Posting - Trial Balance Cash Book - Subsidiary Book - Final A/Cs (Trading P/L A/C and B/S) with Adjustments Like Closing Socks , Outstanding and Prepaid Expenses & Incomes, Bad Debts, Provision for Bad Debts, Depreciation on Fixed Assets, Interest on Capital and Drawings.

UNIT - II

15Hrs

MANAGEMENT ACCOUNTING: Meaning - Features – Objectives Difference between Management and Financial Accounting- Functions of Management Accountant - Limitations of management Accounting **COST ACCOUNTING:** Meaning - Objectives - Differences between Cost A/C and Financial A/C - Classifications of Cost - Methods of Costing and Significance (Theoretical Aspects only) preparation of Cost Sheet. Very simple problems.

UNIT - III

15Hrs

ACCOUNTING RATIOS: Meaning - Merits and Demerits of ratio Analysis - Simple problems relating to Gross Profit ratio, Net Profit Ratio, Current Ratio, Liquid Ratios, Stock Turn over Ratio and Debtors Turnover Ratio. **WORKING CAPITAL MANGEMENT:** Meaning - Factors – Simple problems for Estimation of Working Capital.

UNIT - IV

15Hrs

BUDGETORY CONTROL: Meaning - Types - Advantages Disadvantages - Preparation of Production Budget - Cash Budget - Flexible Budget.

UNIT - V

15Hrs

BREAK - EVEN ANALYSIS: Meaning - Merits - Demerits - Computation of Break even point - P/V Ratio - Margin of safety - Desired sales at Anticipatory Profit - Selection of profitable mix - Break - even Chart.

REFERENCE BOOKS:

1. INTRODUCTION FOR ACCOUNTING - T.S.Grewal, S.Chand & company.
2. ADVANCED ACCOUNTS - Jain & Narang, Kalyani Publishers.
3. MANAGEMENT ACCOUNTING - R.K.Sharma & Gupta, Kalyani Publishers.

MCA - SEMESTER II
MATHEMATICAL FUNDAMENTALS OF COMPUTER SCIENCE

Instructional Hrs: 60

Objective: Learning about sets, Relations, Functions, Logic, Grammars, Languages and construction of Finite Automs.

UNIT - I **12 Hrs**

Mathematical logic - propositions - Connectives - Algebra of Propositions - Normal forms - Theory of inference - Predicate Logic

UNIT - II **12Hrs**

Set theory - Basic concepts and Notations - Set Operations - Relations - Types of Relations - Operations on Relations - Composition of Relations - Properties of Relations - Partition of a Set- Representation of Relations -Hasse Diagrams.

UNIT - III **12Hrs**

Functions - Representation of a Function - Types of Functions - Classification of Functions - Inverse of a Function - Binary and n-ary Operations - Properties of binary operations.

UNIT - IV **12Hrs**

Formal languages and automata theory - Introduction - Phrase – structure Grammar - Types of Phrase - Structure grammar - Finite state machine - Finite state Automata.

UNIT - V **12Hrs**

Graph Theory - Basic Definitions - Matrix Representation of Graphs-paths, Cycles, and connectivity - Eulerian and Hamiltonian Graphs -Connectedness in Directed Graphs - Shortest path Algorithms.

TEXT BOOK:

Discrete Mathematics with Graph Theory and Combinatorics, Third Reprint 2007, T.Veerarajan. Tata Mcgraw Hill (Unit - I to V)

MCA - II SEMESTER VISUAL PROGRAMMING

Instructional Hrs: 60

- Objectives: 1. Identify and describe the purpose of various components of the VB Integrated Development Environment.
2. Build and run VB applications using various controls.
3. To learn Database connectivity.

UNIT - I

12Hrs

Getting started - Visual Basic Environment - Initial VB screen – Single Document interface - Toolbars and Custom control components - Use of File, Edit, View, project, Format, Run, Debug, Tools, Window Menu – Properties window - Making a form responsive - Simple event procedures for command buttons - image controls, Text boxes, Labels, Navigating between controls, Message boxes - The grid.

UNIT - II

12Hrs

Steps in Programming - The code window - Editing Tools – Statements in VB - Assignment - Property Setting - Data Types - Variables, Strings, Numbers, Constants - input boxes - Displaying information - Controlling program Flow - Repeating Operations - Making Decisions - GOTO - String functions - Date and time functions.

UNIT - III

12Hrs

Passing by reference - Passing by value - Lists: One dimensional Arrays- Arrays with more than one dimensions - Using Lists and Arrays with functions and procedures - Control Arrays - Records (user defined types) -WITH Statements -Code modules: Global Procedures and Global Variables -Common Dialog Boxes - MDI forms.

UNIT - IV

12Hrs

ODBC and Data Access: ODBC using Data Access Object and Remote Data Objects - Object Linking and Embedding: OLE fundamentals – using OLE container control - using OLE automation objects - OLE drag and drop.

UNIT - V

12Hrs

All about ActiveX Controls - ActiveX EXE and ActiveX DLL – ActiveX document fundamentals - Build -in ActiveX controls - Working with ActiveX Data Objects.

Text Books:

1. Visual basic 6.0 From the Ground Up, Gray Cornell, Tata McGraw Hill Publishing Company Limited, Reprint 2009, (UNIT I, II, III)
2. Visual Basic 6.0 Programming, Content Development Group, Tata McGraw Hill Education Private Limited, 2010(UNIT IV, V)

Reference Book:

1. Doing Objects in VB 6, Deborah Kurata, Techmedia, 1999.

MCA - SEMESTER III
ADVANCED JAVA PROGRAMMING (J2EE)

Instructional Hrs: 60

Objectives: 1. To understand the architecture of Tiers.
2. To design front end programs using advanced Java.

UNIT - I **12Hrs**

J2EE OVERVIEW: J2EE MULTI - TIER ARCHITECTURE: - The Tier, J2EE Multi - Tier Architecture, Client Tier and Web Tier Implementation, J2EE PRACTICES: Enterprise Application, Clients, Session Management, Web Tier, EJB Tier, J2EE **DATABASE CONCEPTS:** JDBC OBJECTS-Database Connection, JDBC/ODBC Bridge, Statement Objects, Result set.

UNIT - II **12Hrs**

JSP OVERVIEW: How JSP works, JSP syntax and symantics, JSP Development Model, Components of JSP, Developing JSP pages, JSP Actions.

UNIT - III **12Hrs**

JSP, Expression, Scriptlet, Implicit Object Declaration, **REQUEST DISPATCHING:** Anatomy of Request Processing, JSP Include Actions, Passing Parameters, Forwarding Requests, **SESSION AND THREAD MANAGEMENT:** Hidden Field, URL Rewriting, Cookies, Manipulating Sessions.

UNIT - IV **12Hrs**

STRUTS: Struts Environment, Developing and Deploying Applications in Struts, Creating Actions in Struts, **IMPLEMENTING INTERSECTORS IN STRUTS:** Intersectors Types.

UNIT - V **12Hrs**

CONTROLLING EXECUTION FLOW WITH TAGS: Control Tags and Data Tags, **PERFORMING VALIDATION:** Understanding Validators in Struts, Defining Validators Scope, Creating Custom validators.

Text Books:

1. J2EE - THE COMPLETE REFERENCE, JIM KEOGH, Tata Mcgraw Hill Publishing, Edition 2002 (UNIT, I)
- 2 THE COMPLETE REFERENCE JSP, 2.0, PHIL HANNA, Tata Mcgraw Hill Publishing, Edition 2003 (UNIT, II & III)
3. STRUTS BLACK BOOK, KOAGENT, Dream Tech Publications, Second Edition. (UNIT, IV & V)

Reference Books:

1. J2EE, UNLEASED, Techmedia Publication, First Indian Edition

**MCA - SEMESTER III
CLIENT/ SERVER COMPUTING**

Instructional Hrs: 60

- Objectives: 1. To understand the architecture of client/server computing.
2. To develop applications with front end and back end components.
3. Learning of various types of client & servers.

UNIT - I

12Hrs

INTRODUCTION TO CLIENT/SERVER COMPUTING: What is Client/Server, File Servers, Database Servers, Transaction Servers, Groupware Servers, Object Servers, Web Servers, Middleware, Fat Servers/Clients, 2 Tier versus 3 Tier, **CLIENT/SERVER BUILDING BLOCKS:** Building block Arrangements, Inside the Building block, **CLIENT, SERVER AND OPERATING SYSTEMS:** Operating Systems, Base Services, Extended Services, Server Scalability, RPC, Messaging and Queuing.

UNIT - II

12Hrs

SQL DATABASE SERVERS: SQL Database Server Architectures, Stored Procedures, Triggers and Rules, **DATA WAREHOUSES:** What is OLTP, DSS, EIS, The Data Warehouse.

UNIT - III

12Hrs

CLIENT / SERVER TRANSACTION PROCESSING: ACID Properties, Transaction Models, TPMONITORS: Transaction Processing Monitors, Transaction Management Standards, **CLIENT/SERVER GROUPWARE:** Introduction to Groupware, Components of Groupware.

UNIT - IV

12Hrs

CLIENT/SERVER DISTRIBUTED OBJECTS AND COMPONENTS: Benefits of Distributed Objects, Component, Super Components, 3 Tier Client/server Object, Style, **CORBA:** CORBA style, CORBA Distributed object, OMG'S Object management architecture, Object Request Broker (ORB), Anatomy of a CORBA 2.0 ORB, CORBA Object Services and Common Facilities, **OLE/DCOM:** OLE and OLE Constituent Technologies.

UNIT - V

12Hrs

WEB CLIENT/SERVER: Web Client/Server Interaction, URL, HTML Tutorial, HTTP Request and Response Format, HTML 2.0 Web Based Forms, CGI, Web Security, **DISTRIBUTED SYSTEM MANAGEMENT:** Distributed System Management platforms, Components of an Open DSM platform, **DISTRIBUTED SYSTEM MANAGEMENT STANDARDS:** Internet's SNMP, SNMP's limitations, OSI Management Framework, OSI Management Protocols CMIP.

Text Book:

1. CLIENT SERVER SURVIVAL GUIDE, ROBERT ORFALI, DAN HARKEY, JERI EDWARDS, Galgotia Publications pvt.Ltd, Second Edition Reprint 2010(UNITS I to V).

MCA- SEMESTER III
DESIGN AND ANALYSIS OF ALGORITHM

Instructional Hrs: 60

Objective: Understanding various algorithm design techniques and to know how to apply those techniques to various problems.

UNIT - I **12Hrs**

Introduction - What is an algorithm? - Algorithm specification – performance analysis - divide and conquer - General method - binary search - Finding the maximum and minimum - merge sort - quick sort - strassen's matrix multiplication.

UNIT - II **12Hrs**

The greedy method - the general method - knapsack problem -job sequencing with deadlines - minimum cost spanning tree - prim's algorithm - Kruskal's algorithms - optimal storage on tapes - single source shortest paths.

UNIT - III **12Hrs**

Dynamic programming - the general method - multistage graphs – All Pairs shortest paths - 0/1 knapsack - Reliability Design - The traveling sales Person problem - Flow shop scheduling.

UNIT - IV **12Hrs**

Basic Traversal and search Techniques - Techniques for binary trees -Techniques for graphs - Connected components and spanning trees - Biconnected components and DFS.

UNIT - V **12Hrs**

Backtracking - The general method - The 8 Queen problem - sum of subsets - Graph coloring - Hamiltonian cycle - Knapsack problem-Branch and Bound - 0/1 Knapsack problem - Traveling salesperson problem.

Text Book:

1. Fundamentals of computer algorithms, Ellis Horowitz,
Satra J Sahni, Sanguthevar Rajasekaran, Galgotia
publications Pvt. Ltd, (UNIT - I to V)

MCA - SEMESTER III
SYSTEM PROGRAMMING AND OPERATING SYSTEM

Instructional Hrs: 60

Objectives: 1. To learn about language processors and Assemblers.

2. To study and apply concepts related to operating systems such as concurrency control, deadlocks and file system organization.

UNIT - I **12Hrs**

Language Processors - Introduction - Processing Activities - Fundamentals- Data Structure - Allocation of Data Structure - Scanning - Parsing.

UNIT- II **12Hrs**

Assemblers - Elements of Assembly Language Schema - Simple Assembly Schema - Pass Structure of Assembler - Design of Two Pass Assembler - Compiler - Aspects of Compilation - Memory Allocation - Compilation of Expression - Compilation of Control Structure - Code Optimization - Linkers.

UNIT- III **12Hrs**

Introduction to OS - File System and Management - File type and Operation- block based Organization - Polices in Practice - Process Management - Process Status - Scheduling polices - Context Switches - Memory Management- Relocation Concept - Linking and loading Concept- Process and Main Memory Management - Policies - Virtual memory paging - Implementation and Replacement.

UNIT - IV **12Hrs**

I/O Management - Issues - Organization - HW/SW Interfaces – Management of buffers - Disk Scheduling - Resource sharing and Management - Need for Scheduling - Mutual Exclusion - Deadlock - Deadlock Detection – Prevention Algorithm - Critical Section - Semaphores - Inter Process Communication - Creating New Process - Establishing Inter Process Communication.

UNIT - V CASE STUDY **12Hrs**

UNIX AND LINUX - History of Unix - Overview - Processes in Unix - Memory management in Unix - Input Output in Unix

Text Books:

1. DM DHAMDHRERE, System Programming and Operating System Second Edition, Tata Mc Graw Hill Publication.
2. PRAMOD CHANDHA, P.PHATT, An introduction to Operating Systems, Second Edition, PHI Publication.
3. ANDEW S.TANENBAUM, Modern Operating System, Second Edition, Pearson Publication.

**MCA - SEMESTER IV
. NET PROGRAMMING**

Instructional Hrs: 60

- Objectives: 1. Learning the fundamentals of web page design using ASP
2. To create web pages with back end connectivity and custom controls.

UNIT - I **12Hrs**

ASP.NET INTRODUCTION: The Net framework, learning Net languages- Data types, Declaring variables, Scope, Conditional Structure, Functions and Subroutines, Basics about Classes, Value types, Reference types.

UNIT - II **12Hrs**

DEVELOPING ASP.NET APPLICATIONS: ASP.NET Applications, Code - behind, Global.asax file, Web config File, **WEB FORM FUNDAMENTALS:** A Simple page Applet, HTML control Classes, Page Class.

UNIT - III **12Hrs**

WEB CONTROLS: Basic Web Controls, Web control Classes, Auto Post back and Web control Events, **VALIDATION AND RICH CONTROLS:** Calendar, Ad Rotator controls, Validation controls and process, Regular Expressions, **STATE MANAGEMENT:** Session State Basics.

UNIT - IV **12Hrs**

OVERVIEW OF ADO.NET: Characteristics of ADO.NET, ADO.NET Object Model. **ADO.NET DATA ACCESS:** SQL Basics and Select Statement, Creating a Connection, Accessing, Modifying and Updating Data, Disconnected Data, **DATA BINDING:** Single value Data Binding and Repeated value Data Binding.

UNIT - V **12Hrs**

DATA LIST, DATA GRID AND REPEATER: Using Templates with Data List, Data Binding with Templates, Comparing Templates Controls, **ADVANCED CUSTOM CONTROLS:** User Controls, Deriving Controls.

Text Book:

1. THE COMPLETE REFERENCE ASP.NET:- MATHEW MAC DONALD, Tata McGraw Hill Publishing, Edition 2002 (UNIT - I to V)

Reference Book:

1. ASP.NET AND VB.NET PROGRAMMING, MATT J.CROUCH, Pearson Education (UNIT I to V).

MCA - SEMESTER IV

GRAPHICS AND MULTIMEDIA

Instructional Hrs: 60

- Objectives: 1. To understand the concepts of graphics and multimedia.
2. To apply the various algorithms to display pictures.
3. To understand various displays & projection techniques.

UNIT I OUTPUT PRIMITIVES

12Hrs

Introduction - Overview of computer Graphics - Output Primitives: Line - Circle and Ellipse Drawing Algorithms - Attributes of output Primitives - Two Dimensional Geometric Transformations - Two - Dimensional Clipping and Viewing.

UNIT II THREE - DIMENSIONAL CONCEPTS

12Hrs

Three - Dimensional Concepts -Three dimensional object Representations - Three - Dimensional Geometric and modeling transformations - Three - Dimensional Viewing

UNIT III COLOR MODELS AND ANIMATION

12Hrs

Visible - Surface Detection Methods: Back -Face, Depth - Buffer, A-Buffer Scan - line. Depth - Sorting, BSP -Tree and Octree Methods - color Models: RGB, CMY, HSV and HLS Color Models - Computer Animation

UNIT IV MULTIMEDIA SYSTEMS DESIGN

12Hrs

An introduction - Multimedia applications - Multimedia System Architecture - Evolving technologies for multimedia - Defining objects for Multimedia systems - Multimedia Data interface standards -Multimedia Databases.

UNIT V MULTIMEDIA FILE HANDLING

12Hrs

Compression & Decompression - Data & File Format standards - Multimedia I/O technologies - Digital voice and audio - Video image and animation- Full motion video - Storage and retrieval Technologies.

Text Books:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003 (Unit - I to III)
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI 2003. (UNIT - IV & V)

Reference Books:

1. Judith Jeffcoate, "Multimedia in practice technology and Applications" PHI, 1998.
2. Foley Vandam, Feiner, Huges, "Computer Graphics: Principle & Practice", Pearson Education, second edition 2003.

MCA - SEMESTER - IV
MICROPROCESSORS & ASSEMBLY LANGUAGE PROGRAMMING

Instructional Hrs: 60

- Objectives:**
1. To enable the students to understand the working of a CPU.
 2. To let the students interact with the CPU through assembly language programming.
 3. To help the students to learn about interfacing of peripheral devices.

Unit 1 **12 Hours**

Introduction: 8086 Microprocessor, Pin configuration. Memory organization. 8086 based system: 8086 minimum mode configuration, 8086 maximum mode configuration, 8086 bus cycle.

Unit 2 **12 Hours**

8086 instruction set: Addressing modes of 8086, Instruction Format, Instruction set of 8086: Data Transfer, Arithmetic, Logical, Shift & Rotate, String, Adjustment, Flag Related, Control Transfer & Processor Control

Unit 3 **12 Hours**

8086 Interrupts: Interrupt system, Classification of interrupts, Interrupts of 8086, Interrupt pointer table, Interrupt sequence. 8259A PIC: Programming of 8259A, Operating modes of 8259A.

Unit 4 **12 Hours**

Serial and Parallel data transfer: Microprocessor controlled data transfer, DMA, Serial transmission, Types of communication system, Serial transmission format, Baud rates. 8251 USART: Block Diagram, Control word, Data transfer operations.

Unit 5 **12 Hours**

Programmable Peripheral Interfacing chips: 8255: Block diagram, Operational description, Mode 0, Mode 1, Mode 2, 8255 interfacing, Interfacing of stepper motor.

Text book: Sunil Mathur, Microprocessor 8086: Architecture, Programming & Interfacing, PHI Learning Pvt Ltd, 2011

Ref. Book: William B. Jones, Assembly Language Programming for the IBM PC, 3rd Edition, Dreamtech Press, 2002

MCA - SEMESTER IV
SOFTWARE ENGINEERING & QUALITY ASSURANCE

Instructional Hrs: 60

- Objectives: 1. To understand the management and technical aspects of the engineering discipline to learn about software product and process.
2. To enable the students to learn about project planning, estimation, analysis and design.
3. To learn about to produce high quality software.

UNIT I **12Hrs**

Software characteristics - Software Engineering Layers - Software Process - Process Models - Linear Sequential, Evolutionary and Formal Methods – Software Measurements size Oriented, Function Oriented, Extended Function point metrics, Metrics for Quality.

UNIT - II **12Hrs**

Software Project Planning - Software Scope, Resource - Project Estimation - Problem Based, Loc Based, Process Based Estimation - Estimation Models - Cocomo Model - Software Quality - Quality Assurance - Software Reviews - Formal Technical Reviews - Statistical Quality Assurance - Software Reliability - SQA Plan

UNIT - III **12Hrs**

Software Requirements Analysis - Communication Techniques - Analysis principles - Software Prototyping - Specification - Software Design Concepts- Effective Modular Design - Cohesion - Coupling- Design - Documentation- Real Time Systems and Design Methods - Data, Architecture, Transform and Transaction Mapping, Interface and Procedural Design.

UNIT - IV **12Hrs**

Software quality in business context: The Meaning of “Quality”, Defining Quality - The quality challenge - Why is quality important? - Quality Control V/S Quality Assurance - Quality Assurance at each phase of SDLC - Quality Assurance in software support projects - The SQA function - Managing software quality in an organization: Quality management system: Various expectations - Quality assurance: Some diagnostic questions - The need for the SQA group in an organization - Planning for software quality assurance: Software quality assurance plans - Software quality assurance: Organizational level initiatives - quality planning - Some interesting dilemmas and observations.

UNIT - V

12Hrs

Product quality and process quality: Introduction - Software systems evolution - Product quality - Models for software product quality - Process quality - software measurement and metrics: Overview - Introduction - Measurement during software life cycle context - Defect metrics - Metrics for software maintenance - classification of software metrics - Requirements related metrics - Measurements and process improvement - Measurement principle - Identifying appropriate measures and metrics for projects - Metrics implementation in projects - Benefits of measurement and metrics for project tracking and control - Earned value analysis - planning for metrics program - Issues in software measurements & metrics program- Implementation - Object oriented metrics: An overview.

Text Books:

1. Software Engineering - A practitioner's approach, Rogger S.Pressman, McGraw Hill companies Inc 1998 (Unit I to III)
2. Nina S. Godbole "Software Quality Assurance Principle and Practice," Narosa, 2004 (Unit IV & V)

MCA - IV SEMESTER

PRINCIPLES OF COMPILER DESIGN

Instructional Hrs: 60

- Objectives:
1. Introducing students to the concepts and principles of compiler design.
 2. Providing students with basic understanding of grammars and language definition.
 3. Introducing students to the various phases of designing a compiler.

UNIT - I

12Hrs

Introduction - The Structure of a Compiler - Compiler writing tools - The Lexical and Syntactic Structure of a language - The role of the Lexical Analyzer- Design of Lexical Analyzers - Regular Expression - Finite automata.

UNIT - II

12Hrs

Context - Free Grammars - Derivations and parse tree - Capabilities of Context - free Grammars - Parsers - Shift - reduce parsing - Operators - Precedence Parsing - Top-down parsing - Predictive parsers.

UNIT - III

12Hrs

LR parsers - The Canonical collection of LR (0) items - Constructing SLR parsing Tables - Symbol Tables - Data Structure for Symbol Tables.

UNIT - IV

12Hrs

Syntax - directed translation Schemes - Implementation of Syntax – directed translators - Intermediate Code - postfix notation - Parse tree & Syntax trees - Three address code - Translation of assignment statements - Boolean expression.

UNIT - V

12Hrs

The Principal source of optimization - Loop optimization - DAG representation of basic blocks - problems in code generation - A sample code generator.

Text Books

Principles of Compiler Design.
- Alfred V.Aho & Jeffrey D.Ullman, Narosa Publishing House.
(Units I to V)

Reference Books:

1. Compilers: Principles, Techniques and Tools (2<sup>nd</sup> Edition) Alfred V.Aho, Monica S.Lam, Ravi Sethi and Jeffrey D.Ullman
2. Compiler Construction: Principles and Practice Kenneth C.Louden.

**MCA - SEMESTER V
SOFTWARE PROJECT MANAGEMENT AND TESTING**

Instructional Hrs: 60

- Objectives: 1. To learn about the activities involved in software project management.
2. To understand various techniques for effort estimation.
3. To learn about Resources and various testing techniques.

UNIT - I

12Hrs

Introduction to software project management Project - Software project Vs Other types - Activities covered - Project as system - Management - Problems with software projects -Management control - Stakeholders - Requirement specification - Information and control in organization. Stepwise: An overview of project planning Project evaluation - Strategic assessment – Technical assessment - Cost benefit analysis - Cash flow forecasting - Cost benefit evaluation techniques - Risk evaluation. Selection of an appropriate project approach: Choosing technologies - Technical plan content list - Choice of process models - Structured methods - Rapid application development - The waterfall models - The V-process model - The spiral model –software prototyping - Incremental delivery - An Incremental example- Selecting the most appropriate process model.

UNIT - II

12Hrs

Software Effort Estimation: Introduction - Where are estimates done? -Problems with over and under estimates - The basis for software estimating-Software effort estimation techniques - Expert Judgement - Estimating by analogy - Albrecht function point analysis - Function points mark II - Object points - A procedural code - Oriented approach - COCOMO: a parametric model - Activity Planning: Introduction - The Objectives of activity planning - When to plan - Project Schedules - project and Schedules- Projects and activities - Sequencing and scheduling activities - Network planning models - Formulating a network model - Using dummy activities - Represented lagged activities - Adding the time dimension - The forward pass - The Backward pass - Identifying critical activities path – Activity Float - Shortening the project duration - Identifying critical activities - Precedence networks - RISK Management; Introduction - The nature of risk Managing risk - Risk Identification - Risk Analysis - Reducing the risks - Evaluating risks to the schedule - Calculating the z values.

UNIT III

12Hrs

Resource allocation: Introduction - The nature of resources - Identifying resource requirements - Scheduling resources - Creating critical paths - Counting the cost - Being specific - Publishing the resource schedule - Cost schedules - The scheduling sequence - Monitoring and control: Introduction - Creating the framework - collecting the data - Visualizing progress - Cost monitoring - Earned value - Prioritizing monitoring - Getting the project back to target- Change control - Managing contracts - Managing people and organizing teams: Understanding behaviour - Organizational behaviour: A background

- Selecting the right person for the job - Instruction in the best methods - Motivation - Working in groups - Becoming a team - Decision making - Leadership - Organizational structures.

UNIT - IV

12Hrs

Software Development Life Cycle models: Phases of Software project - Quality, Quality Assurance, Quality control - Testing, Verification and Validation-Process Model to represent Different Phases - Life Cycle models - White – Box Testing: Static Testing - Structural Testing.

Black - Box Testing:- How to do Black - Box Testing?- Integration Testing: Integration Testing as Type of Testing - Integration Testing as a Phase of Testing - Scenario Testing - Defect Bash.

UNIT - V

12Hrs

System and Acceptance Testing: Functional versus Non - functional Testing – Functional system testing – non-functional testing - Acceptance Testing.

Performance Testing: Methodology of Performance Testing - Tools for Performance Testing - process for Performance Testing.

Regression Testing: What is Regression Testing? - Types of Regression Testing. Testing planning, Management, Execution and Reporting: Test planning - Test Management - Test process - Test Reporting.

Test Metrics and Measurements: Project Metrics - Progress Metrics - Productivity Metrics - Release Metrics.

Text Books:

1. Bob Hughes And Mike Cotterell, “Software Project Management,” Tata McGraw Hill - Third Edition 2004 (Unit I to III)
2. SOFTWARE TESTING Principle and practices - Srinivasan Desikan & Gopal Ramesh, 2006, Pearson Education. (Unit - IV & V)

MCA SEMESTER-V
XML AND WEB SERVICES

Instruction Hours : 60

Objectives : 1. To understand the basic programming constructs in XML
2. To design real-world enterprise applications using web services

UNIT-I

INTRODUCTION TO XML: The Current Standards,XML Structure,XML Elements, writing & Parsing Documents,Layer of elements,Commenting XML code, **CREATING WELL-FORMED XML:** Documents basics,Creating and Describing elements, **WORKING WITH ATTRIBUTES:** Defining attributes,Defining multiple attributes, Using pre-defined attributes.

- 15 Hours

UNIT-II

DTD & VALIDATION: Adding DTDs to Documents, Public vs system DTDs, Declaring Element types, Controlling element content, **DTD ENTITIES:** Types, Defining general entities & Parameter entities, **XML NAMESPACES:** Namespaces, Namespaces with Document & DTD, **STYLE SHEET:** XSLBasics, **TRANSFORMING XML WITH XSLT:** Style sheet structure, Elements,Templates rules,Looping with in a template rule, Conditional processing, Sorting.

- 15 Hours

UNIT-III

SCHEMA: DTD's &Schema, Writing a basic schema, Schema elements, simple & complex element types using groups. **DATA SOURCE OBJECT:** Tabular data control, XML Data source objects, XML Islands, Working with XML islands, **THE DOCUMENT OBJECT MODEL:** DOM, XML Interfaces, XML Objects.

- 12 Hours

UNIT- IV

WEB SERVICES: Introduction, web services, Application oppurtunities, **EMERGENCE OF WEB SERVICES:** Server side and client side architecture progression, **SOAP:** SOAP Modelling, SOAP encoding, SOAP binding.

- 10 Hours

UNIT-V

WSDL: Introduction, Web service invocation & WSDL, Web service description details, Service description through WSDL,**UDDI:** Nomenclature, Core UDDI, Service publication and discovery.

- 8 Hours

REFERENCE BOOKS:

1. THE COMPLETE REFERENCE XML-HEATHER WILLIAMSON, Tata McGraw-Hill Edition, 2011[UNIT I,II,III]
2. MASTERING XML-AK SAINI,SUMIT TULI,XL BOOKS, 1<sup>st</sup> EDITION 2002[UNIT III]
3. WEB SERVICES AN INTRODUCTION -B V KUMAR, S V SUBRAHMAYA, Tata McGraw-Hill Publication,2009[UNIT IV,V]

MCA - SEMESTER - V
MOBILE COMMUNICATION

Instructional Hrs: 60

- Objectives: 1. To facilitate the students to learn about mobile medium.
2. To help the students to understand the various media for mobile communication.
 3. To help the students to learn about harnessing the power of internet through wireless media.

UNIT-I **12Hrs**

WIRELESS TRANSMISSION: Frequencies, Signals, Antennas, Multiplexing, Modulation, Spread Spectrum.

MEDIUM ACCESS CONTROL: Specialized MAC, SDMA, FDMA, TDMA, CDMA.

UNIT-II **12Hrs**

TELE COMMUNICATION SYSTEMS: GSM: Mobile Services, System Architecture, Radio Interference, Protocols, Localization, Handover, Security, New Data Services.

Satellite systems: GEO, LEO, MEO, Routing, Localization, Handover.

UNIT-III **12Hrs**

Wireless LAN: IEEE 802.11, Hiper LAN.

UNIT-IV **12Hrs**

Mobile Network Layer: Mobile IP, DHCP, Mobile Ad Hoc Networks.

UNIT-V **12Hrs**

Mobile Transport Layer: Traditional TCP, Classical TCP improvements, TCP over 2.5a & 3.0a Wireless Networks, performance enhancing proxies

WAP: Architecture, WDP, WTLS, WTP, WSP, WAE, WTA.

Text Book:

Joochen Schiller, Mobile Communications 2<sup>nd</sup> ED, Pearson, 2009.

DATA WAREHOUSING & MINING

Instructional Hrs: 90

- Objectives: 1. To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues and implications.
2. Describe the range of techniques for designing data mining and data ware housing systems.
3. Understand the strengths and limitations of various data mining models.

UNIT - I

12Hrs

DATAMINNING:

INTRODUCTION: Importance of data mining, kinds of data applicable of data mining, Data mining functionalities, Classification of data mining systems, Major issues in data mining, **DATA PREPROCESSING:** Data cleaning, Data integration and transformation, Data reduction, Discretization and concept hierarchy generation.

UNIT - II

12Hrs

DATA MINING PRIMITIVES AND ARCHITECTURES: Data mining primitives, Query language, Architectures of data mining systems-
CHARACTERIZATION AND COMPARISON: Concept description, Data generalization and summarization - Based characterization, Mining class - comparisons, Mining descriptive statistical measures.

UNIT-III

12Hrs

CLASSIFICATION AND PREDICTION: Issue, classification by decision tree induction and back propagation, Other classification methods, Prediction Classifier accuracy - **MINING COMPLEX TYPES OF DATA:** mining spatial database, mining multimedia databases, mining text databases

UNIT - IV

12Hrs

DATA WAREHOUSING:

OVERVIEW AND CONCEPT- The need for data warehousing, The building blocks of data warehouse, Trends in data warehousing.

UNIT -V

12Hrs

ARCHITECTURE AND INFRASTRUCTURE- The architectural components, Infrastructure as the Foundation for Data Warehousing-**INFORMATION ACCESS AND DELIVERY OLAP** in the Data Warehouse

Text Books:

1. DATA MINING CONCEPTS AND TECHNIQUES: Jiawei Han, Micheline Kamber, Harcourt, India Pvt.Ltd, First Edition, 2001 (UNIT I to III)
2. DATA WAREHOUSING FUNDAMENTALS, Paulraj Ponniah, A Wiley Interscience publications (UNITS IV & V)

Reference Books:

1. DATA MINING, Peter Adriaans, Dolf Zantinge, Addison Wesley, 1998.
2. BUILDING DATA MINING APPLICATIONS FOR CRM- Alxn berson, Stephen smith, Kurt Thearling, Tata McGraw Hill Publishing, 2001(UNIT - V)

MCA - SEMESTER V
TCP/IP Protocol Suite

Instructional Hrs: 60

- Objectives: 1. To help the students to understand the concepts of networking.
2. To enable the students to learn the technologies behind internet.
 3. To help the students to understand the protocols used in internet.

UNIT - I **12Hrs**

OSI Model & TCP/IP protocol suite: OSI model; TCP/IP protocol suite, addressing, Wired LAN, Wireless LAN, Point to point WAN, Switched WAN, Connecting devices.

UNIT II **12Hrs**

Network Layer: Packet switching at network layer, Network layer services, IPv4 addressing: Classful addressing, Classless addressing, Special addresses, NAT. Forwarding of IP Packets, Delivery, Forwarding, Structure of a router

UNIT III **12Hrs**

IPv4: Datagrams, Fragmentation, Options, Checksum. ARP: Address mapping, ARP protocol, ARP package. ICMPv4: Messages, Debugging tools, ICMP package. Unicast Routing Protocols: Intra and inter domain routing, Distance vector routing, RIP, Link state routing, OSPF, Path vector routing: BGP.

UNIT IV **12Hrs**

Transport Layer: Transport layer services, Transport layer protocols, UDP: User datagram, UDP services, UDP applications, UDP package. TCP: TCP services, TCP features, Segment, A TCP connection, TCP features, Segment, TCP connection, State transition diagram, Windows in TCP, Flow control, Error control, Congestion control, TCP timers, Options

UNIT V **12Hrs**

Application Layer: Host configuration DHCP: DNS, Remote login, FTP & TFTP, WWW & HTTP, Email.

Text Book:

Behrouz A. Forouzan, TCP/IP protocol suite, Fourth Edition, Tata Edition, Tata Mc Graw Hill Education Pvt. Ltd, 2010.

Reference Book:

Andrew S. Tanenbaum, Computer Networks, Fourth Edition, PHI, 2007

M.C.A

Question paper pattern:

SECTION - A

Answer all questions. No choice. One question from each unit. Each question Carries three Marks. (5 x 3 = 15)

SECTION - B

Essay type questions of either or type - 5 questions - One question from each Unit. (5 x 11 = 55)

SUPPORTIVE PAPER
For students of other than Computer Science Department
III - SEMESTER
RELATIONAL DATABASE MANAGEMENT SYSETEM

Instructional Hrs: 90

- Objectives: 1. To equip the participants with the relevant quantitative tools and techniques for application in solving managerial problems.
2. To understand the role of the DBMS & RDBMS in the organization.
3. To understand the concepts include aspects of database design, database languages and database system implementation.

UNIT - I

18 Hrs.

Introduction to database management systems – History of database management systems, need for database, characteristics of DBMS, Types of DBMS, The Relational model , The Hierarchical model, The network model – Introduction to RDBMS – RDBMS terminology, The Relational Data Integrity, Referential Integrity, Relational Data Manipulation – Data Modeling – Principles of Normalization up to 5<sup>th</sup> Normal form.

UNIT - II

18 Hrs.

Overview of Oracle – Oracle products, The oracle architecture – overview of database Oracle products, The oracle architecture – Overview of database and instances, Internal memory structure , Process structures, External structures and architecture – Logical database layouts – System, Data, Indexes, Tools , RBS, temp, users – Hardware configuration considerations – Standalone Hosts, Standalone Hosts with arrays, disk shadowing, Multiple databases, Networked Hosts, Networks of databases, clustered servers.

UNIT - III

18 Hrs.

Introduction to SQL – Characteristics and types of SQL, Referring to oracle objects, Parsing SQL, Oracle data types , SQL operators and conditions – Arithmetic, character, comparison, logical and set operators, operator precedence, Tables views, Indexes, sequences –SQL commands – DDL, DCL,DML, Transaction control, session control, System control commands.

UNIT - IV

18 Hrs.

Introduction to PL/SQL – PL/SQL blocks, PL/SQL Basics – Variables and constants, character set, data types, PL/SQL structures, Triggers, Procedures, Snapshots and Synonyms.

UNIT - V

18 Hrs.

Database security – Managing data base users – roles – Privileges – Backup and Recovery – Auditing the database.

TEXT BOOKS:

1. ORACLE 7 – The Application Development Handbook – Alexis Leon, COMDEX Computer Publishing (UNITS 1-5).
2. Essential oracle 7.0 – Tom Leurs, Prentice Hall of India Pvt.Ltd.

REFERENCE BOOKS:

1. ORACLE 7.0 – Complete Reference – George Koch & Kevin Loney, Tata Mc Graw Hill.
2. FUNDAMENTALS OF DATABASE SYSTEMS – Elnasri Navathe, Addison Wesley.

Question Paper Pattern

PART – A

Answer all questions. No choice. One question from each unit. Each question carries three marks. (5 x 3 = 15)

PART – B

Essay type questions of either or type – 5 questions – One question from each unit (5 x 11 = 55)