

ANNEXURE -I

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Marks		
									Mark s	Mark s	Mark s
First Semester	MCA17101	Discrete Mathematical Structures	Compulsory Foundation	4	3	1	0	4	30	70	100
	MCA17102	Introduction to Internet Technologies	Core	4	3	1	0	4	30	70	100
	MCA17103	Object Oriented Programming Using C++	Core	4	3	1	0	4	30	70	100
	MCA17104	Computer Organization	Core	4	3	1	0	4	30	70	100
	MCA17105	Accounting & Financial Management	Core	4	3	1	0	4	30	70	100
	MCA17106	Human Values and Professional Ethics –I	Compulsory Foundation	2	2	0	0	2	30	70	100
	MCA17102 P	Introduction to Internet Technologies Lab		2	0	0	4	4	30	70	100
	MCA17103 P	Object Oriented Programming Using C++ Lab		2	0	0	4	4	30	70	100
	MCA17105 P	Tally Lab		2	0	0	4	4	30	70	100
Total				28	17	5	12	34	270	630	900

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MCA17101: Discrete Mathematical Structures

UNIT – I:

Fundamentals:

Sets, Relations and functions, Fundamentals of logic, Logical Implementation, Logical Equivalence, First order logic, Truth Tables, Tautologies, Mathematical induction

Elementary Combinatorics:

Combinations and Permutations, Enumeration - with repetitions, with constrained repetitions, The Principle of Inclusion - Exclusion. Chapter (1-2)

UNIT –II:

Recurrence Relations:

Generating functions, Coefficients of Generating functions, Recurrence Relations, Methods of Characteristics Roots, Inhomogeneous Recurrence Relations Chapter (3)

UNIT – III:

Relations and Diagrams:

Relations and diagrams, Binary relations, Equivalence relations, Ordering relations, Lattices, Paths and Closures, Directed graphs, Isomorphism, Adjacency matrices - Applications, Sorting and Searching Chapter (4)

UNIT – IV

Trees & Graphs:

Trees, Properties of trees, Graphs, Spanning trees, Binary trees, BFS, DFS, Kruskals Algorithm, Planar graphs, Euler Circuits, Hamiltonian graphs, Chromatic numbers, Four-color problem, Network Flows (Chapter 5 & 7.2)

Text Books:

- 1 Discrete Mathematics For Computer Scientists, (Chapter 1-5) BY J L Mott, A Kandel and T P Baker
- 2 Discrete mathematics by KH Rossen (tmh)

Reference Books:

- 3 Discrete mathematical structure - (tmh) by Trembley and Manohar
- 4 Discrete mathematics with algorithms - (John Wiley) by M. O. Albertson and J .P. Hutchinson
- 5 “Graph Theory with Applications to Engineering and Computer Science” prentice Hall, Englewood Cliffs, 1974.
- 6 J. P Tremblay and R.P Manohar, DMS with Applications to Computer Science, Tata MC. Graw – Hill, 2001.

MCA17102: Introduction to Internet Technologies

UNIT – I:

Introduction to Internet, Internet Services, WWW, Working of Internet, Internet Connection Concepts, Introduction to Intranet, DNS working, Configuring Internet Connection, Connecting LAN to Internet. Single User, Multi User, Server, Workstation, Client-Server environment, Computer Network, Types of Computer Network: LAN, WAN, MAN; Network Topologies. Protocols used in internet FTP, HTTP etc. Windows and GUI. Latest Developments and usage of Internet for IOT, Cloud Computing, Web Services.

UNIT – II:

E-Mail Concepts – Configuring E-Mail Program, Sending and Receiving Files through E-Mail, Fighting Spam, Sorting Mail, and avoiding E-Mail viruses. Web-Based chat rooms and discussion boards, Voice and Video conferencing. Streamlining Browsing, Keeping track of Favorite Web Sites, Web Security, Privacy, and Site-Blocking. Searching the Web – Audio and Video on the Web. Two tier-Three Architectures, Internet Architecture

UNIT-III:

Web Browsers, Search Engines, Categories of Search Engines, Searching Criterion, Surfing the Net, Hypertext Transfer Protocol (HTTP), URL. Other Internet Tools. Online Chatting, Messaging, and Conferencing Concepts, E-Mail mailing lists, Usenet newsgroup concepts – Reading usenet newsgroups, Internet Relay Chat, Instant messaging.

UNIT-IV:

HTML-5: Internet Language, Understanding HTML, Create a Web Page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, E-mail Links and link within a Page, Creating HTML Forms with HTML 5 controls. Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colors, Creating Animated Graphics. Web Page Design and layout, Advanced Layout with Tables, Using Style Sheets.

Text Books:

1. Dick Oliver: Tech Yourself HTML 4 in 24 Hours, Techmedia.
2. Satish Jain: "O" – Level Information Technology,
3. Craig Zacker: 10 minutes Guide to HTML Style Sheets, PHI.
4. V.K. Jain: "O" – Level Information Technology, BPB Publications.
5. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books
6. Publishing Co., New Delhi.
7. Margaret Levine Young: Internet – The Complete Reference
8. Harley Hahn: The Internet – Complete Reference, TMH.
9. Rajender Singh Chillar: Application of IT to Business, Ramesh Publishers, Jaipur.

MCA17103: Object Oriented Programming Using C++

UNIT – I:

Basics, Tokens, Expressions: Software Crisis, Software Evolution, Procedure Oriented Programming Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Features of OOP, Applications of OOP, A Simple C++ Program, Structure of C++ Program, Tokens, Keywords, Identifiers and Constants, Basic Data Types, User Defined Data Types, Derived Data Types, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators.

UNIT – II:

Functions, Classes and Objects: Introduction to classes, Specifying a class, Defining a member Functions, A C++ Program with Class Access Specifiers, Inline function, Nesting of Member Functions, Memory Allocation for Objects, Static Data Members, Static Member Functions, Array of Objects, Object as Function Arguments, Default Arguments, Const Arguments, Function Overloading, Friend Functions & Virtual Functions.

UNIT – III:

Constructors, Destructors, Inheritance: Introduction, Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors, Operator Overloading, Rules for Operator Overloading, Overloading of Binary and Unary Operators, Introduction to Inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Abstract Classes, Constructors in Derived Classes, Containership.

UNIT – IV:

Pointers, Virtual Functions and Polymorphism: Introduction, Polymorphism, Compile time Polymorphism, Runtime Polymorphism, Pointers to objects, this Pointer, Pointers to Derived Classes, , Virtual Functions, Pure Virtual Functions.

Templates and Exception handling: Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function templates with Multiple Parameters, Member Function Templates, Basic of Exception Handling, Exception Handling Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions.

Text Book:

Object oriented Programming in C++ by E. Balagurusamy, Published by Tata McGraw – Hill.

MCA17104: Computer Organization

UNIT - I:

Basic Structure of Computers- Functional Units- Basic Operational Concepts- Bus Structure- Software- Performance- Multiprocessor and Multicomputer – Historical Perspective.

UNIT - II:

Number System and Computer Arithmetic – Signed and Unsigned Numbers, Addition and Subtraction, Multiplication, Division, Floating Point Arithmetic Operations, Logic Gates, Boolean Algebra , K-Maps.

Combinational and Sequential Circuits – Half adder, Full adder, Flip flops, Sequential Circuits, Decoders, Encoders, Multiplexers, Registers, Shift Registers, Binary Counters.

UNIT - III:

Memory Organization - Memory hierarchy, Main memory - RAM, ROM chips, Memory address map, memory connection to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory - Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.

Micro Programmed Control: Control memory, Address sequencing, Micro Program example, design of control unit, Hard wired control, Micro programmed control

UNIT- IV:

Input - Output Organization - Peripheral devices, input-output interface-I/O Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA- DMA control, DMA transfer, Input output processor-CPU-IOP communication.

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Text Book:

1. Mano M.M. Computer System Architecture, 3rd edition. PHI, 1993.
2. Hamacher C, Vranesic Z, and Zaky S. Computer Organization, 5th edition, Mc Graw – Hill,2002.

Reference Books:

1. Stallings W, Computer Organization and Architecture, 6th edition. Parson Education, 2003.
2. Mano M.M. Computer System Architecture, 3rd edition. PHI, 1993.
3. Yarbrough JM, Digital Logic – Applications and Design, Thomas Lernig, 1997.
4. Heuring VP, and Jordan HF, Computer Systems Design and Architecture, Pearson Education, 1997.

MCA17105: Accountancy and Financial Management

UNIT – I:

Accounting Information System – Users of accounting information, Accounting concepts & conventions, Double entry system – Journal, Journalizing.

Ledger Posting – Balancing, Subsidiary books – purchase, Sales, P/R, S/R, Cash Book, cash book Triple column – Problems – Trial Balance – Preparation of T/B problems.

UNIT – II:

Financial Statements – Utility to users, Trading A/C, Profit & Loss A/C – Classification of Expenses.

Classification of Assets and Liabilities - Balance Sheet – Problems – Adjustments: closing stock, outstanding expenses and incomes, prepaid expenses and incomes received in advance, Depreciation, Bad debts, provision for Doubtful debts; interest on capital and Drawings, Problems pertaining to sole Traders, Financial Statements of Non- Profit organization, Receipts & payments A/C, Income and Expenditure A/C and Balance Sheet – simple problems without adjustments.

UNIT – III:

Financial Management: Definition – Need. Financial Analysis – Meaning – indicators of financial status – profitability liquidity, solvency, turnover, Leverage, Types of Financial Analysis – Horizontal Analysis – comparative statements, Vertical Analysis – Common Size statement. Ratio analysis – meaning – Standards of Comparison.

Profitability Ratios – G.P. Ratio, N.P. Ratio, ROI, EPS, P/E Ratio, Liquidity Ratios – current Ratio, Quick Ratio, Solvency Ratios – Debt equity, Debt – Total funds Turnover Ratios – Stock Turnover, Debtors Turnover, Stock velocity, Debt collection period, Fixed assets turnover, working capital turnover, Simple problems on Ratio analysis.

UNIT – IV:

Cost Accounting – Meaning – Significance of cost information Costs – Meaning - Classification : Functional Classification Behavior of costs – Fixed, variable – Features Simple description of costing methods, Preparation Cost sheet under unit costing using functional classification of Costs Cost information for decision making - Decision areas, Marginal Costing – Meaning – Marginal cost Statement, Break even Analysis – Graphic, mathematical Approach, Contribution Margin, P/V Ratio, BEP, Profit Planning, Sales Planning, Sample Problems of Marginal costing, key factor – Simple problems using key factor.

SUGGESTED READINGS:

1. Gupta, R.L. and Radha Swamy, M., Accountancy, Sultan Chand & Sons, New Delhi

2. Mukarjee A and Hanif M, Modern Accountancy, Tata Mc Graw Hill, New Delhi
3. Tulsin P.C, Financial Accounting, TMH, New Delhi
4. Maheswar SN and Maheswari S.K., Financial Accounting, Vikas Publishing House, Mumbai
5. Pandey I.M., Financial Management, Vikas Publishing House, Mumbai.
6. Khan M. Y and Jain P.K., Financial Management, TMH, New Delhi
7. Maheshwari S.N, Cost and Management Accounting, Vikas Publishing House, Mumbai
8. Jain P.K. and Naraang K.L., Cost Accounting, kalyani Publishers, Mumbai
9. Catherine Gowthrope, Business Accounting and Finance: For Non specialists (2nd Ed.) International Thomson Business press, Singapore.
10. Jiamblo – Managerial Accounting (WILEY)

MCA17102P: Introduction to Internet Technologies Lab

1. a) Write a HTML5 Program to create hyperlinks to four websites.
b) Write a HTML5 Program to link an email address.
2. Write a HTML5 Program to include images to web pages.
3. Write a HTML5 Program to create complex table.
4. Write a HTML5 Program to insert special characters in the document.
5. Write a HTML5 Program to adding background images and indentation using CSS
6. Write a HTML5 Program to link an internal style sheet.
7. Create an simple animator of an image that moves in a diamond pattern as its changes opacity.
8. Write a HTML5 Program to skewing and transforming elements in CSS.
9. Write a HTML5 Program to add an image and float the text around the image
10. Write a HTML5 Program to multi column text layout.
11. Write a HTML5 Program to create website registration form with optional survey.
12. Create an auto complete input element with an associated data list that contains days of the week.
13. Write a HTML5 Program to absolute positioning of an element.
14. Link HTML5 page to extend CSS file.
15. Draw a rectangle with a border on a canvas.

MCA17103P: Object Oriented Programming Using C++ Lab

1. Write a C++ program for Armstrong Number.
2. Write a C++ program for calculation of reverse number.
3. Write a C++ program for reverse operation of a string.
4. Write a C++ program for Matrix Multiplication.
5. Write a C++ program for Matrix Addition.
6. Write a C++ program for swapping given values.
7. Write a C++ program for function templates.
8. Write a C++ program for operator overloading.
9. Write a C++ program for function overloading
10. Write a C++ program for display student data using arrays.
11. Write a C++ program for Multiple Inheritance.
12. Write a C++ program for Exception Handling.

MCA17105P: Tally Lab

1. Creating a Company
2. Difference between Accounting Packages
3. Creating a Groups
4. Creating a Ledges
5. Recording of Vouchers into the tally

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Second Semester	MCA17201	Probability & Statistics	Compulsory Foundation	4	3	1	0	4	30	70	100
	MCA17202	Database Management Systems	Core	4	3	1	0	4	30	70	100
	MCA17203	Data Structures using Java	Core	4	3	1	0	4	30	70	100
	MCA17204	Problem Solving through Java	Core	4	3	1	0	4	30	70	100
	MCA17205	Unified Modeling Language	Core	4	3	1	0	4	30	70	100
	MCA17206	Human Values and Professional Ethics – II	Compulsory Foundation	2	2	0	0	2	30	70	100
	MCA17203P	Data Structures using Java Lab		2	0	0	4	4	30	70	100
	MCA17204P	Problem Solving & UML Lab		2	0	0	4	4	30	70	100
	MCA17202P	Database Management Systems Lab		2	0	0	4	4	30	70	100
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VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

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MCA17201: PROBABILITY & STATISTICS

UNIT-I

INTRODUCTION & PROBABILITY

Introduction – Definition of statistics, Measure of central tendency and measure of dispersion - Random Experiment – Sample Space and events – Mathematical probability – some Elementary theorems- Addition theorem of probability - Boole's Inequality - Conditional probability - Multiplication Theorem of probability, Baye's theorem.

UNIT- II

RANDOM VARIABLES:

Definition- Discrete and continuous Random Variable – Properties of Distribution function, Characteristic function, Binomial distribution – Definition – Mean – Variance. Poisson distribution – Definition – Mean – Variance. Normal distribution- Definition – Mean – Variance MGF, Recurrence relation.

UNIT-III

ESTIMATION TECHNIQUES:

CORRELATION: Method of least squares, Definition of correlation. Scatter diagram, Properties of Correlation – Karl Pearson's Coefficient of correlation – Limits for correlation coefficient- Spearman's Rank correlation coefficient.

REGRESSION: Introduction – Linear Regression – Multiple regressions, Properties of Regression.

UNIT-IV

TEST OF HYPOTHESIS: Null and Alternative Hypothesis – Type – I error Type – II error – Critical Region – Level of significance – one tailed and two – tailed test – Neyman – Pearson Lemma.

TEST OF SIGNIFICANCE:

Student's T – Test, F – Test - χ^2 – Test.

Text Book:

1. **Fundamentals of Mathematical Statistics**, Gupta, Kapoor , S.Chand

Reference:

1. **Probability and statistics for MCA**, T.K.V.Iyengar, B.krishna Gandhi, S.Ranganathan, M.V.S.S.N.Prasad, S.Chand and Company Ltd.
2. **Probability and Its Applications**, Murray R Spiegel,Schaum Series, TMH
3. **Engineering Mathematics**, B.V.Ramana, TMH., 2002,

4. **Introduction to probability and statistics**, J.S.Milton, Jesse C.Arnold, 4/e, TMH.

MCA17202: DATABASE MANAGEMENT SYSTEMS

UNIT – I

Overview of Database Systems – Managing Data, A Historical Perspective, File Systems Vs Aa DBMS, Advantages of a DBMS, Describing and Storing Data in a DBMS, Queries in a DBMS, Transaction Management, Structure of a DBMS, People who work with DBMS

Introduction to Database Design – Database Design and ER Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design with the ER Model, Conceptual Design for Large Enterprises, The Unified Modeling Language, Case Study: The Internet Shop

UNIT – II

The Relational Model – Introduction, Integrity Constraints over Relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/ Altering Tables and Views, Case Study: The Internet Store

Relational Algebra and Calculus – Preliminaries, Relational Algebra, Relational Calculus, Expressive Power of Algebra and Calculus

UNIT – III

SOL: Queries, Constraints, Triggers – Overview, The Form of a Basic SQL Query, Union, Intersect and Except, Nested Queries, Aggregate Operators, Null Values, Complex Integrity Constraints in SQL, Triggers and Active Database, Designing Active Databases

UNIT – IV

Database Application Development – Accessing Databases from Applications, An Introduction to JDBC, JDBC Classes and Interfaces, SQLJ, Stored Procedures, Case Study

Internet Applications – Introduction, Internet Concepts, HTML Documents, XML Documents, The Three – Tier Application Architecture, The Presentation Layer, The Middle Tier

TEXT BOOK:

1. Database Management Systems by Raghu Ramakrishnan, Johannes Gehrke, 3rd Edition.

MCA17203: DATA STRUCTURES USING JAVA

UNIT I

Linear Data Structures : Abstract Data Types –Linear and Non Linear Data types – OOPS Concepts - Simple Program -Pointers -Arrays – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions

UNIT II

Non-Linear Data Structures: Trees – Binary Trees – Binary tree representation and traversals – Threaded binary trees – Binary tree representation of trees – Application of trees: Tree traversals– Graph and its representations – Graph Traversals methods and its applications.

Search Structures And Priority Queues: AVL Trees – Red-Black Trees – Splay Trees – Binary Heap – Leftist Heap

UNIT III

Sorting: Insertion sort – Merge sort – Quick sort – Heap sort – Sorting with disks – k-way merging – Sorting with tapes – Polyphase merge.

UNIT IV

Searching And Indexing: Linear Search – Binary Search - Hash tables – Overflow handling – Cylinder Surface Indexing – Hash Index – B-Tree Indexing.

Text Book:

1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Book Sorce, Gurgaon, 1976. 2. Gregory L. Heilman, Data Structures, Algorithms and Object Oriented Programming, Tata Mcgraw-Hill, New Delhi, 2002.

References:

1. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, Second Edition, Tata McGraw-Hill, New Delhi, 1991.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.

MCA17204: PROBLEM SOLVING THROUGH JAVA

UNIT – I

Introduction to Java – Features, JVM, Parts of Java, First step towards Java Programming- API Document, Starting a Java Program, Formatting the Output, Naming Conventions and Data Types, Literals, Operators in Java, Control Statements, Input and Output

UNIT – II

Arrays – Types of Arrays, Three Dimensional Arrays, arrayname.length, Command Line Arguments, Strings, StringBuffer and StringBuilder–Creating StringBuffer Objects, StringBuffer Class Methods, StringBuilder Class, StringBuilder Class Methods, Introduction to OOPs - Problems in Procedure Oriented Approach, features of OOP system

UNIT – III

Classes and Objects – Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors, Methods in Java, Relationship between Objects, Inheritance, Polymorphism

UNIT – IV

Type Casting, Abstract Classes, Interfaces, Packages, Exception Handling, Wrapper Classes, Streams and Files, Threads, Graphics Programming using AWT

TEXT BOOK

1. Core JAVA An Integrated Approach by Dr. R. Nageswara Rao, Dreamtech Publication, 2014 Edition.

MCA17205: UNIFIED MODELING LANGUAGE

UNIT- I

Introduction to UML – Models and Modeling, Methodologies, The Unified Modeling Language, Design models and code, The Software Development process.

Modeling with Objects – The object model, Classes and Objects, Object Properties, Avoiding Data replication, Links, Associations, Message Passing, Polymorphism, Dynamic binding, the applicability of the object model

Software Development Processes - The Waterfall Model, Alternatives to the Waterfall Model, The Unified Process, The role of models in development, the use of UML in the Unified Process

Restaurant System: Business Modeling – Informal requirements, Use case modeling, Describing Use cases, Structuring the use case model, Completing the use case model, Domain Modeling

UNIT- II

Restaurant System: Analysis - The Purpose of Analysis, Object Design, Software architecture, Use case realization, recording new Bookings, Cancelling Bookings, Updating Bookings, Completing the analysis model

Restaurant System: Design – Receiving Input from The User, Producing Output, Persistent data Storage, The design model, detailed class Design, Dynamic modeling of behavior, A statechart for the booking system, A statechart for the Reservations

UNIT- III

Restaurant System: Implementation - Implementation diagrams, Implementation strategies, Application framework, The Java AWT framework, Implementation of classes, Implementation of associations, Implementation of operations

Class and Object Diagrams – Data Types, Classes, Describing Objects with classes, Associations, Generalization and Specialization, Inheritance of attributes and Operations, Aggregation, Composition, Association classes, N-ary associations, Interfaces, Templates

UNIT- IV

Interaction Diagrams - Collaborations, Classifier roles, Association roles, Interaction Diagrams, Object Creation, Object Destruction, Role Multiplicity and Iterated Messages, Multiobjects, Conditional Messages, Messages to Self

Statecharts – State-dependent Behavior, States, Events, Transitions, Initial and Final States, Guard Conditions, Actions, Activities, Composite States, History States, Summary of the CD Player, Dynamic Modeling in Practice, Time Events, Activity States, Summary of the ticket machine

Component Diagrams - Dependencies, Components and artefacts, Component Diagrams, Some Common Physical Relationships, Compilation dependencies, Components and Interfaces

TEXT BOOK

1. Practical Object – Oriented Design With UML by Mark Priestley, 2nd Edition

Courses Offered to Other Departments by the Computer Science Department

1. Foundation in Computer Applications

UNIT-I

Introduction to computer systems: Types of Computers, Characteristics of computers; History of Computer systems, Evaluation and Generation, Basic Anatomy of computer systems: Basic components, Functions of Components, Memory software and hardware components, Input devices and Output devices;

Computer Software: System software and application software: Types of programming languages: Machine level, Assembly level, High level and natural languages;

Operating systems: Introduction and function of OS, Introduction to windows XP and Linux.

UNIT-II

Introduction to MS-Office: MS-Word- Word basics – creating and printing documents – formatting features – mail merge – templates, Macros.

MS-Excel : Excel Basics- creating and printing sheets, formula creation, formatting , menu, command, toolbars, data sort and usage of built-in-function.

MS-Power Point: PowerPoint basics – Navigating, creating and editing power point presentations, slides creation with graphics, animation, pictures, and auto content wizard. Import and Export of documents, slides and worksheets. Indian Language editors either in Windows / I-heap

UNIT-III

Page Maker: Navigating in page maker – PageMaker environment elements, navigating a page maker document, creating a document: Document setup and saving using text using and importing graphics.

Multi-Page Documents: Multi-Page Document setup , Master Pages, Inserting Pages and working with text working with frames : creating Text Frames , formatting Text: Character formatting , Paragraph formatting, working with indents, Tabs and Rules Graphics: working with Text and Graphics, attaching text to a frame.

UNIT-IV

Internet Fundamentals : Introduction to NET and their components, basics definition of LAN, MAN & WAN, Search Engine, Browsing Techniques, Saving , Copying , Downloading .E-mail: Creating of E-mail , Sending E-Mail, Attaching files reading mails forward , compose , save and reply.

TEXTBOOK

1. A First Course in Computers, 2005 Edition, by Sanjay Saxena Vikas Publishing House Pvt. Ltd (For Unit-I, II, IV).

2. PC HARDWARE

UNIT – I

An Inside Look at a Contemporary PC – The Contemporary PC, Disassembly/ Reassembly Notes, Standardized Form Factors.

An Inside Look at Monitors – Monitor assembly, working with On – Screen Controls, Notes on Monitor Disassembly and Reassembly.

UNIT – II

An Inside Look at Operating Systems and the Boot Process – The PC Hierarchy, Understanding popular OS features, A closer look at MS-DOS, The boot process, creating a DOS boot disk, windows 9x/ Me maintenance tips

Arranging the preservice checkout – The universal troubleshooting process, Benchmarking the PC, Viruses and computer service, Quick – Start Bench Testing.

UNIT – III

Backup Guide – Backup Considerations, Using Microsoft Backup, Using Backup Exec, Backup Troubleshooting.

BIOS – Typical Motherboard BIOS, BIOS Features, BIOS and Boot Sequences, BIOS Shortcomings and Compatibility Issues, BIOS Troubleshooting, BIOS Upgrades.

Busses – Industry standard Architecture (ISA), Peripheral Component Interconnect (PCI), Accelerated Graphics Port (AGP), General Bus Troubleshooting

UNIT - IV

Conflict Troubleshooting – Understanding System Resources, Recognizing and Correcting Conflicts.

CPU Identification and Troubleshooting – CPU Essentials, Modern CPU Concepts, The Intel CPUs, The AMD CPUs, The VIA Cyrix CUs, CPU Overclocking, Troubleshooting CPU Problems

Data Recovery Techniques – Understanding Data Loss, Protecting Drives and Data, Recovering Files and Folders, Recovering FAT and Discovery Damage, Recovery the MBR, Data Recovery Tips, Data Recovery Troubleshooting.

TEXT BOOK:

1. Troubleshooting, Maintaining & Repairing PCs by Stephen J. Bigelow, 5th Edition.

3. INTERNET FOUNDATION

UNIT I:

Prerequisites for Internet – Hardware, Software, Others, Factors Affecting the speed of Internet Connectivity, Configuring the Modem, Configuring a TCP/IP connection.

UNIT II

Introduction, Important Features, Internet Protocols (IP Address, Domain Naming System (DNS) Communication Protocols), Connecting to the Internet (Dial-up Connections, Digital Subscriber Line (DSL) ,Cable Modems, Integrated Services Digital Network(ISDN).

UNIT III:

Search Engine – How Search Engines works, Preliminary Searching Hints, Boolean Searching, Using a Search Engine.

UNIT IV:

E-Mail – Creating an Email Account, Sending and Receiving E-Mails, Receiving E-Mails, Internet Phone, Google Earth.

TEXT BOOK:

1. A first course in computers based on Windows XP and Office XP by ‘Sanjay Saxena’.

REFERENCE BOOKS:

1. Fundamentals of Computers by Er. Anil Jamwal, Dr. Avinash Chiranjeev, Md. Azharul Haque.
2. Digital Computer Fundamentals by S Poornachandra.

MCA17203P: DATA STRUCTURES USING JAVA LAB

1. Write a Program to implement STACK Operations Using Arrays
2. Write a Program to implement QUEUE operations using Arrays
3. Write a Program to implement operations on Double Linked List?
4. Write a Program to implement STACK Operations using Linked List
5. Write a Program to implement QUEUE Operations using Linked List
6. Write a Program to construct Binary Search Tree and implement
 - a. Pre-Order b. In-Order c. Post Order traversals
2. Write a Program to sort the list of elements using Bubble Sort Technique
3. Write a Program to sort the list of elements using Selection Sort Technique
4. Write a Program to sort the list of elements using Quick Sort Technique
5. Write a Program to sort the list of elements using Merge Sort Technique
6. Write a Program to sort the list of elements using Insertion Sort Technique
7. Write a Program to search a key element in the given list of elements using Binary Search Technique
8. Write a Program to implement Breadth First Search (BFS)Technique
9. Write a Program to implement Depth First Search (DFS)Technique

MCA17204P: PROBLEM SOLVING & UML LAB

PROBLEM SOLVING LAB:

1. Write a Java Program to accept a year number from the key and test if it is leap or not.
2. Write a Java Program for calculating and displaying area of a circle.
3. Write a Java program to create a push button and add it to a frame.
4. Write a Java program to find the areas of Square and Rectangle by deriving them from Shape.
5. Write a Java program to make cloning Employee class object by writing own myclone() method, from where Object class clone() method is called.
6. Write a Java program for calculating electricity bill for commercial and domestic plans by using abstract class
7. Write a Java program to create an interface that connects to a database and retrieves the data from the database.
8. Write a Java Program to create a package and store Addition class and Subtraction class in it.
9. a) Write a Java program for Multiple Exception Handling.
b) Write a Java program to throw a User Defined Exception.
10. Write a Java Program to convert int into binary, hexadecimal and octal format.
11. Write a Java Program to Compress and Uncompress the data.
12. Write a Java program for Serialization and De-Serialization of objects.
13. Write a Java program for to synchronize the threads acting on the same object. Synchronize block can be executed only one thread at a time
14. Write a Java program for Thread Deadlock.
15. Write a Java program for creating Thread Groups.
16. Write a Java program for animates the things using threads.
17. Write a Java program for creating a frame and close it using WindowAdapter class.
18. Write a Java program for drawing a smiling face in a frame with filled colors.
19. Write a Java program to display an image in the frame and also in the title bar of the frame.
20. Write a Java program to trap the key code and key name typed by the user on the keyboard and display them in a text area.

TEXT BOOK

1. Core JAVA An Integrated Approach by Dr. R. Nageswara Rao, Dreamtech Publication, 2014 Edition.

UML LAB:

1. Develop Class Diagram, Usecase Diagram, Activity Diagram, Sequence Diagram, Collaboration Diagram, Component Diagram, Deployment Diagram, State Transition Diagram for ATM System

2. Develop Class Diagram, Usecase Diagram, Activity Diagram, Sequence Diagram, Collaboration Diagram, Component Diagram, Deployment Diagram, State Transition Diagram for Library Management System.

MCA17202P: DATABASE MANAGEMENT SYSTEMS LAB

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
3. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
4.
 - i. Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
 - ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
5. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
6. Write PL/SQL procedure for an application using exception handling.
7. Write PL/SQL procedure for an application using cursors.
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. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
11. Implementing operation on relation using PL/SQL
12. Generating Reports

REFERENCES:

1. ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.
3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
4. Database Systems using Oracle: A Simplified Guide to SQL and PL/SQL, Shah, PHI.

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Third Semester	MCA17301	Software Engineering	Core	4	3	1	0	4	30	70	100
	MCA17302	Operating Systems	Core	4	3	1	0	4	30	70	100
	MCA17303	Unix & Network Programming	Core	4	3	1	0	4	30	70	100
	MCA17304	Advanced Java Programming	Core	4	3	1	0	4	30	70	100
	MCA17305	Computer Graphics	Core	4	3	1	0	4	30	70	100
	MCA17306	The courses offered by other Departments	Open Elective	4	0	0	0	4	0	100	100
	MCA17302P	Operating Systems Lab		2	0	0	4	4	30	70	100
	MCA17303P	Unix & Network Programming Lab		2	0	0	4	4	30	70	100
	MCA17304P	Advanced Java Programming Lab		2	0	0	4	4	30	70	100
Total				30	15	5	12	36	240	660	900



VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

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VIKRAMA SIMHAPURI UNIVERSITY COLLEGE: NELLORE

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MCA17301: SOFTWARE ENGINEERING

UNIT – I

SOFTWARE, SOFTWARE ENGINEERING, AND PROCESS: The nature of Software, The unique nature of WebApps, Software engineering- A layered technology, The essence and principles of software engineering practice, Generic process model (framework), Process patterns, Process assessment and improvement, CMMI, Software myths.

PROCESS MODELS: Prescriptive process models: The waterfall model, Incremental process models, Evolutionary process models. The Unified process, Aspect oriented software development.

AGILE DEVELOPMENT: Agile process, extreme programming.

UNIT-II

UMBRELLA ACTIVITIES: Risk management, Software quality assurance, Software configuration management.

MEASUREMENT AND METRICS: Size oriented metrics, Function oriented metrics, Metrics for software quality.

SOFTWARE REQUIREMENTS: Introduction to functional and non-functional requirements, Requirements engineering activities, Eliciting requirements, *Requirements modeling*, Requirements validation, Software requirements specification(SRS), Requirements management. **Requirements modeling: Structured view:** Data modeling (ERD), Flow-Oriented modeling(DFD), Behavioral modeling, Object models, Structured methods. **Software Project Estimation:** Empirical estimation models.

UNIT III

DESIGN CONCEPTS: Software design quality guidelines and attributes, Design concepts, Design model.

SOFTWARE ARCHITECTURE: Architecture and its importance, Architectural Styles, Data design, Architectural design.

DESIGN : Structured view (Traditional view): Architectural mapping using data flow (Call and return architecture), Interface design, Function based component design.

OBJECT ORIENTED VIEW: OO Architecture, Class hierarchies, Message design, Class based component design.

PERFORMING USER INTERFACE DESIGN: Golden rules, User interface analysis and design, interface analysis, interface design steps.

PATTERN BASED DESIGN: Design patterns, Pattern based software design, Architectural patterns, Component level design patterns, User interface design patterns.

UNIT IV

TESTING STRATEGIES: A strategic approach to software testing – Verification and Validation – Organizing for Software Testing – Testing Strategies – Criteria for completion of testing – unit, integration, validation and system testing – debugging.

TESTING TACTICS: Testing Fundamental – White Box, Black Box, and Control Structure Testing – Object Oriented testing Methods.

PRODUCT METRICS: Metrics for the requirements model, Metrics for the design model, Metrics for source code, Metrics for testing, Metrics for maintenance.

TEST BOOK:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 7th edition. McGrawHill International Edition.

REFERENCES:

1. Software Engineering- Sommerville , 8th edition, Pearson education.
2. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
3. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
4. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
5. Software Engineering principles and practice- Waman S Jawadekar, The McGraw- Hill Companies.

MCA17302: OPERATING SYSTEMS

UNIT – I

INTRODUCTION: What is an Operating Systems Do, Computer System Organization, Computer System Architecture, Operating – System Structure, Operating – System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special – Purpose Systems, Computing Environments

SYSTEM STRUCTURES: Operating – System Services, User Operating – System Interface, System Calls, Types of System Calls, System Programs, Operating – System Design and Implementation, Operating – System Structure, Virtual Machines, Operating – System Generation, System Boot

PROCESS – CONCEPT: Overview, Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Communication in Client – Server Systems

UNIT – II

PROCESS SCHEDULING: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple – Processor Scheduling, Thread Scheduling, Operating System Examples, Algorithm Evaluation

SYNCHRONIZATION: Background, The Critical – Section Problem, Peterson’s Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions

DEADLOCKS: System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

UNIT – III

MEMORY – MANAGEMENT STRATEGIES: Background, Swapping, Contiguous Memory Allocation, paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium

VIRTUAL – MEMORY MANAGEMENT: Background, Demand Paging, Copy – on – Write, Page Replacement, Allocation of Frames, Thrashing, memory – Mapped Files, Allocating Kernel Memory, Other Considerations, Operating – System Examples

FILE SYSTEM: File Concept, Access Methods, Directory Structure, File – System Mounting, File Sharing, Protection

UNIT – IV

IMPLEMENTING FILE SYSTEMS: File – System Structure, File – System Implementation, Directory Implementation, Allocation Methods, Free – Space Management, Efficiency and Performance, Recovery, Log – Structured File Systems, NFS, Example: The WAFL File System

SECONDARY – STORAGE STRUCTURE: Overview of Mass – Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap – Space management, RAID Structure, Stable – Storage Implementations, Tertiary – Storage Implementation

I/O SYSTEMS: Overview, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Request to Hardware Operations, STREAMS, Performance

TEXTBOOK:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Seventh Edition.

MCA17303: UNIX & NETWORK PROGRAMMING

UNIT- I

INTRODUCTION – History, Layering, OSI Model, Processes, A Simplified Model, Client – Server Model, Plan of the Book.

THE UNIX MODEL – Introduction, Basic Definitions, Input and Output, Signals, Process Control, Daemon Processes

INTERPROCESS COMMUNICATION: Introduction, File and Record Locking, Simple Client-server Pipes, FIFO's, Streams and Messages, Name Spaces, System V IPC, Message Queues, Semaphores, Shared Memory, Socket and TLI.

UNIT – II

A NETWORK PRIMER

COMMUNICATION PROTOCOLS: Introduction, TCP/IP, XNS, SNA, NetBIOS, OSI Protocol, UUCP, Protocols Comparisons.

UNIT - III

BERKELEY SOCKETS: Introduction, Overview, Unix Domain Protocols, Socket Addresses, Elementary Socket System Calls, Simple Examples, Advanced Socket System Calls, Reserved Ports, Stream Pipes, Passing File Descriptors, Socket Options, Asynchronous I/O, Input/output Multiplexing, Out-of-Band and Data, Sockets and Signals, Internet Super server, Socket Implementation.

UNIT – IV

SYSTEM V TRANSPORT LAYER INTERFACE: Transport, Overview, Transport Endpoint Addresses, Elementary TLI Functions, Simple Example, Advanced TLI Functions, Streams, TLI Implementation, Stream Pipes, Passing File Descriptors, Input/output Multiplexing, Asynchronous I/O, Out-of-Band Data.

TEXT BOOK:

1. UNIX NETWORK PROGRAMMING BY W. RICHARD STEVENS

MCA17304: ADVANCED JAVA PROGRAMMING

UNIT – I

JAVA2 ENTERPRISE EDITION OVERVIEW – The ABC of Programming Languages, Taking Programming Languages Up a Notch, The Beginning of Java, Java Bytecode, The Advantages of Java, J2EE and J2SE

J2EE MULTI –TIER ARCHITECTURE – Distributive Systems, The Tier, J2EE Muti – Tier Architecture, Client Tier Implementation, Web Tier Implementation, Enterprise JavaBeans Tier Implementation, Enterprise Information Systems Tier Implementation, Challenges

J2EE BEST PRACTICES - Enterprise Application Strategy, The Enterprise Application, Clients, Sessions Management, Web Tier and JavaServer Pages, Enterprise JavaBeans Tier, The Myth of Using Inheritance, Maintainable Classes, Performance Enhancements, The Power of Interfaces, The Power of Threads, The Power of Notification

J2EE DESIGN PATTERNS AND FRAMEWORKS – The Pattern Concept, Pattern Catalog

UNIT – II

J2EE DATABASE CONCEPTS - Data, Database, Database Schema, The art of Indexing.

JDBC OBJECTS - The Concept of JDBC, JDBC Driver Types, JDBC Packages, A Brief Overview of the JDBC Process, Database Connection, Associating the JDBC/ODBC Bridge with the Database, Statement Objects, ResultSet, Transaction Processing, Metadata

JDBC AND EMBEDDED SQL - Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data from a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, View.

UNIT – III

JAVA AND XML – Generating an XML Document, Parsing XML, Quick Reference Guide.

JAVA SERVLETS – Java servlets and Common Gateway Interface Programming, A Simple Java Servlet, Anatomy of a Java servlet, Reading Data from a Client, Reading HTTP Request Headers, Sending Data to a Client and Writing the HTTP Response Header, Working with Cookies, Tracking Sessions

JAVA SERVERPAGES – JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects

UNIT – IV

ENTERPRISE JAVABEANS – Enterprise JavaBeans, Deployment Descriptors, Session Java Bean, Entity Java Bean, Message – Driven Bean, The JAR File

JAVA INTERFACE DEFINITION LANGUAGE AND CORBA – The Concept of Object Request Brokerage, Java IDL and CORBA, The IDL Interface, The Client Side, The Server Side, Running the Code.

JAVA REMOTE METHOD INVOCATION – Remote Method Invocation Concept, Server Side, Client Side

TEXT BOOK

1. The Complete Reference J2EE by Jim Keogh, Tata McGraw – Hill Edition

UNIT-I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT-II

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrusbeck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

UNIT-III

3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

UNIT-IV

Visible surface detection methods : Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCE BOOKS:

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2ndedition.
4. "Principles of Interactive Computer Graphics, "Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

MCA17303P UNIX AND NETWORK PROGRAMMING LAB

- 1) Display type of a given file using command line argument.
- 2) Write a program to display parent and child process details. (Process ID, Parent Process ID, Group ID, User ID)
- 3) Write a program to print number of Links &last access of a file.
- 4) Simulate Inter Process Communication(Parent and Child Process) using PIPE
- 5) Simulate IPC(two different process) using FIFO
- 6) Implement Message queue for Sending and Receiving messages.
- 7) Simulate IPC between two different process using Shared memory
- 8) Simulate Synchronous between two different process using Semaphore
- 9) Design TCP Server/Client process which accepts simple messages from Client and gives response using Socket.
- 10) Design UDP Server/Client process which accepts simple messages from Client and gives response using Socket.

1. Simulate the following CPU Scheduling algorithms
 - a) Round Robin
 - b) SJF
 - c) FCFS
 - d) Priority
2. Simulate all file allocation strategies.
 - a) Sequential
 - b) Indexed
 - c) Linked
3. Simulate MVT and MFT
4. Simulate all File organization techniques.
 - a) Single level directory
 - b) Two level
 - c) Hierarchical
 - d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm Dead Lock Prevention.
7. Simulate all Page replacement algorithms.
 - a) FIFO
 - b) LRU
 - c) LFU
 - d) Etc....
8. Simulate Paging Techniques of memory management.

1. Write a JDBC Application which creates following menu.
 1. Select statement
 2. Statement other than select statement
 3. ExitEnter your choice (1..3):
2. Write a JDBC Application to select values from table using prepared statement
3. Write a JDBC Application finding out all the tables in the database.
4. Write a JDBC Application for SQL procedure Execution with both IN and OUT parameter using callable statement.
5. Write a client/server application using stream sockets
6. Write a client/server application using datagram sockets
7. Write a program for simple file transfer.
8. Write a program for on RMI Application to call a method.
9. Write an RMI Application with Form Designing
10. Write a Bean Application for starting and stopping the Juggler Bean and execute it in Applet
11. Write a Bean Application to implement all Bean properties.
12. Write a Bean Application for Rotating a Molecular Bean
13. Write a Servlet program to communicate html-Servlet.
14. Write a Servlet program for invoking the get and post methods.
15. Write a Servlet program for session tracking using cookies.

TEXT BOOK:

1. JAVA How to Programming BY DEITEL & DEITEL (PEARSON Education - Third Edition-3001)



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Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Fourth Semester	MCA17401	Operation Research	Compulsory Foundation	4	3	1	0	4	30	70	100
	MCA17402	Design & Analysis of Algorithms	Core	4	3	1	0	4	30	70	100
	MCA17403	Data Mining & Data Warehousing	Core	4	3	1	0	4	30	70	100
	MCA17404	Computer Networks	Core	4	3	1	0	4	30	70	100
	MCA17405	1. System Programming 2. Software Testing	Generic Elective	4	3	1	0	4	30	70	100
	MCA17406	Courses offered by other Departments	Open Elective	4	0	0	0	0	0	100	100
	MCA17403P	Data Mining & Data Warehousing Lab		2	0	0	4	4	30	70	100
	MCA17404P	Computer Networks Lab		2	0	0	4	4	30	70	100
	MCA17407P	Mini Project		2	0	0	4	4	30	70	100
Total				30	15	5	12	36	240	660	900



VIKRAMA SIMHAPURI UNIVERSITY:: NELLORE

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MCA17401 OPERATIONS RESEARCH

UNIT I

Introduction to Operations Research

Basics definition, scope, objectives, phases, models and limitations of Operations Research, Linear Programming Problem – Formulation of LPP, Graphical solution of LPP, Simplex Method, Artificial variables, big-M method, Two phase simple method, Degeneracy & Unbounded solutions. Dual Simplex problem, Comparison of solutions of the dual and its primal, Dual simple method.

UNIT II

Transportation Problem

Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method, Optimality test- the stepping stone method and MODI method.

Assignment model

Formulation, Hungarian method for optimal solution, Solving unbalanced problem, Traveling salesman problem as assignment problem.

Sequencing models

Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

UNIT III

Replacement Models

Replacement of Items that deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

Non-Linear Programming

Basic concepts of Non linear programming, Problem Constrained, Unconstrained optimization, Kuhn-kucker conditions, Quadratic programming.

UNIT IV

Games Theory

Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game, Solution of games with saddle points, dominance principle, Rectangular games without saddle point – mixed strategy for 2 X 2 games, graphical method, dominance principle.

Inventory models

Inventory costs, Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

Text Books:

1. Kanthi Swaroop , P.K Gupta and Man Mohan , “Operations Research”, 4th edition,2001.

Reference Books:

1. P.K.Gupta and Man Mohan ”Problem solving in Operations Research”, Sultan Chand,1990.
2. A.Taha Handy,”Operations Research”, Macmillan Publishing company,Newyork,1997, 6th edition.

MCA17402: DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big notation, Omega notation, theta notation and Little notation, Probabilistic analysis, Amortized analysis.

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT-II

Divide and conquer: General method, [applications](#)-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-IV

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms.

TEXT BOOKS:

1. Fundamentals of [Computer](#) Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and [Internet](#) examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.

REFERENCES:

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and .Stein, PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education

MCA17403 DATA MINING & DATA WAREHOUSING

UNIT - I:

Data Mining & OLAP Technology for Data Mining: What is Data Mining, Data Mining Functionalities, and classification, Data Mining Task, Integrating a Data Mining System, Major issues in Data Mining, Descriptive Data Summarization, and Data Cleaning, Data Integration and transformation, Data reduction, Data Discrimination and concept Hierarchy Generation?

UNIT - II:

Data Warehousing & OLAP Technology: . What is Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse implementation, From Data Warehouse to data mining, Efficient methods for Data Cube Computation, feature development of data cube and OLAP technology, Attribute – oriented Induction.

UNIT - III:

Data Mining Patterns Association and Correlations: Basic Concepts of frequent patterns, Frequent Item sets, mining methods, Association rules, what is classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Association mining to correlation analysis, Constraint based association mining.

UNIT – IV:

Data Mining Methods: Classification by back propagation, support vector, machines and other classification methods, What is Cluster analysis, types, Partitioning methods, Hierarchical methods, Density Based methods, Grid Based methods, and Model-Based Clustering methods, Outlier analysis, Graph mining, Social network analysis and multidimensional data mining

TEXT BOOK:

1. Data Mining Concepts & Techniques By Jiawei Han, Micheline & Kamber (2nd Edition) Harcourt India (Elsevier Publishing Company)

REFERENCE BOOKS:

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION
6. DATA WAREHOUSING, DATA MINING & OLAP BY ALEX BERSON AND STEPHEN J. SMITH (TMH)

7. Data Warehousing by S Mohanthy (TMH)
8. Data Warehousing using Oracle by Deshpande (Dreamtech)
9. Data Warehousing by Amitesh Sinha (Thomson)
10. Data Mining by P Adriaans & D Zantinge (Pearson)
11. Data Mining by S M Sivanandam & S Sumathi

MCA17404 COMPUTER NETWORKS

UNIT – I:

Introduction – Data Communications, Networks, The Internet, Protocols and Standards.

Network Models – Layered Tasks, the OSI Model, Layers in the OSI Model, TCP/IP Protocol Suite, Addressing.

Physical Layer and Media – Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance.

Digital Transmission – Digital – To – Digital Conversion, Analog – To- Digital Conversion, Transmission Modes

Analog Transmission - Digital – To – Analog Conversion, Analog – To- Analog Conversion

UNIT – II:

Bandwidth Utilization: Multiplexing and Spreading – Multiplexing, Spread Spectrum,

Transmission Media – Guided Media, Unguided Media: Wireless

Switching: Circuit – Switched Networks, Datagram Networks, Virtual – Circuit Networks, Structure of a Switch

UNIT – III:

Error Detection and Correction – Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum

Data Link Control – Framing, Flow and Error Control, Noisy Channels, HDLC, Point – Point Protocol

Multiple Access – Random Access, Controlled Access, Channelization

UNIT – IV:

Network Layer: Logical Addressing – IPv4 Address, Ipv6 Address

Network Layer: Address Mapping, Error Reporting and Multicasting – Address Mapping, ICMP, IGMP, ICMPv6

Congestion Control and Quality of Service – Data Traffic, Congestion, Congestion Control, Two Examples, Quality of Service, Techniques to Improve Qos, Integrated Services, Differentiated Services, Qos In Switched networks

Application Layer – Name Space, Domain Name Space, Distributed of Name Space, DNS in the Internet, Resolution, DNS Message, Types of Records, Registers, Dynamic Domain Name System (DDNS), Encapsulation

Remote Logging, Electronic Mail and File Transfer: Telnet, Electronic Mail, File Transfer

TEXT BOOK:

1. Data Communications and Networking by Behrouz A Forouzan, 4th Edition, Tata McGraw Hill Education PVT Lmted.

ELECTIVE: MCA17405 - 1. SYSTEM PROGRAMMING

UNIT – I:

Background – Introduction, System Software and Machine Architecture, The Simplified Instructional Computer, Traditional (CISC) Machines, RISC Machines

Assemblers: Basic Assembler Functions, Machine – Dependent Assembler Features, Machine – Independent Assembler Features, Assembler Design Options, Implementation Examples

UNIT – II:

Loaders and Linkers – Basic Loader Functions, Machine – Dependent Loader Features, Machine – Independent Loader Features, Loader Design Options, Implementation Examples

UNIT – III:

Micro Processors – Basic Macro Processor Functions, Machine – Independent Macro Processor Features, Macro Processor Design Options, Implementation Examples

UNIT – IV:

Compilers - Basic Compiler Functions, Machine – Dependent Compiler Features, Machine – Independent Compiler Features, Compiler Design Options, Implementation Examples.

TEXT BOOK:

1. System Software An Introduction to System Programming by Leland L. Beck and D. Manjula, 3rd Edition

2. SOFTWARE TESTING

UNIT – I:

Software Quality Assurance – The Software Crisis, the Birth of Software Engineering, what is Software Engineering, Why Software Engineering, Is the Software Crisis overcome, The Software Chaos, Criteria for the success of a Software Project, Process – Oriented software Development, Phases in Software Development Life Cycle, Software Development Life Cycle Models, The Management Processes, Software Quality Assurance, Quality Management Systems, Process Change Management

UNIT – II:

Software Testing process – Psychology of Testing, Verification and Validation, Testing team and Development Team, Cost of Quality, Characteristics of Test Engineers, Why Testing is Difficult, Levels of Testing, Testing Approaches, Types of Testing, Test Plan, Criteria for Completion of Testing, Software Reliability, Manual Testing and its Limitations/Drawbacks.

Software Testing Tools: An Overview – Need for Automated Testing Tools, Taxonomy of Testing Tools, Functional/Regression Testing Tools, Performance Testing Tools, Testing management Tools, Source Code Testing Tools, How to Select a Testing Tool

UNIT – III:

WinRunner – Overview of WinRunner, Testing an Application using WinRunner, Test Script Language (TSL), GUI MAP File, Synchronization of Test Cases, Data-Driven Testing, Rapid Test Script Wizard, Mapping Custom Object to a Standard class, Checking GUI Objects.

Silk Test – Overview of Silk Test, Architecture of Silk Test, Testing an Application Using Silk Test, The 4Test Scripting Language, Checkpoints, Data-Driven Test Cases.

SQA Robot – Overview of SQA Robot, Testing an Application using SQA Robot, Synchronization of Test Procedures, Creating Checkpoints.

UNIT – IV:

JMeter – Jmeter Overview, JDBC Test, HTTP Test

TestDirector – TestDirector Overview, Testing Management Process, Managing the Testing Process Using Test Director

TEXT BOOK

1. Software Testing Tools by Dr.K.V.K.K. Prasad, 2010 Edition.

Courses Offered to Other Departments by the Computer Science Department

1. PROGRAMMING IN C

UNIT – I:

What is C, Getting started with C, The first C program, Compilation and Execution, Receiving Input, C Instructions, Control Instructions, Decisions, If statement, If-else, Logical Operators

UNIT – II:

Loops – While, for, Odd loop, break, continue statements, do – while loop, the case control structures – Decisions using switch, switch versus if-else ladder

UNIT – III:

Functions & Pointers – Function, Passing Values, Scope Rule, Calling Convention, One Dicey issue, Advanced features, Adding functions to the library, The C Preprocessor – Features, Macro Expansion, File Inclusion, Conditional Compilation, #if and #elif Directives, the Build process

UNIT – IV:

Arrays – Arrays, Pointers and Arrays, Two Dimensional Arrays, Array of Pointers, Three Dimensional Array, Structures, File Input/Output – Data Organization, File Operations, Counting Characters, Tabs, Spaces, File Opening Modes, Record I/O in Files, Text Files and Binary Files, Record I/O Revisited, Database Management, Low Level Disk I/O, I/O under windows

TEXT BOOK

1. Let Us C by Yashawant Kanetkar, 9th Edition.

2. PROGRAMMING IN VISUAL BASIC

UNIT – I:

The Visual Basic Environment and Help System: The initial Visual Basic Screen, The SDI (Single Document Interface) Environment, Tool Bars, Toolbox and Custom Controls and Components.

Customizing A Form and Writing Simple Programs: Starting a New Project, The Properties Window, Common Form Properties, Scale Properties, Color Properties, Making A Form Responsive, Printing A Visual Representation of a Form.

UNIT – II:

First Steps in Building the User Interface: Creating Controls, The Name (Control Name) Property, Properties of Command Buttons, Simple Event Procedures for Command Buttons, Access Keys, Image Controls, Text Boxes, Labels, Message Boxes.

First Steps in Programming: Visual Basic's Editing Tools, Statements in Visual Basic, Variables, Setting Properties with Code, Data types, Working with Variables, More on Strings.

Displaying Information: Displaying Information on a Form, The Format Function, Picture Boxes, Rich Text Boxes, The Printer Object.

UNIT – III:

Controlling Program Flow: Determinate Loops, Indeterminate Loops, Making Decisions (Conditionals), Select Case, Nested If-Then's, The GoTo

Built – in Functions: String Functions, The Like Function and Fuzzy Searching, The RND Function, Bit- Twiddling Functions, Numeric Functions, Date and Time Functions, Financial Functions, Tables with the most Useful Functions.

Writing Your Own Functions and Procedures: Function Procedures, Sub Procedures, Advanced uses of Procedures and Functions, using the Object Browser to Navigate among Your Sub Programs

UNIT – IV:

Organizing Information Via Code: Lists: One Dimensional Arrays, Arrays with more than one Dimensions, Using Lists and Arrays with Functions and Procedures, The New Array based String, Sorting and Searching, Records (User Defined Types), The with Statement, Enums.

Organizing Information Via Controls: Control Arrays, Lists and Combo Boxes, The Flex Grid Control

Finishing the Interface: The Toolbox Revisited, Common Dialog Boxes, The Microsoft Windows Common Controls 6.0, menus, MDI Forms.

An Introduction to Graphics: Fundamentals of Graphics, Screen Scales, the Line and Shape Controls, Graphics via Code, Lines and Boxes, Circles, Ellipses and Pie Charts, Curves.

TEXT BOOK:

1. Visual Basic 6 from the Ground UP by Gary Cornell, Mc Graw Hill Education, Edition 1999.

3. DESKTOP PUBLISHING (DTP)

UNIT – I:

Preparing for Desktop Publication: Introduction, Learning System, Project Planning Page Design, Working and Editing manuscript, Creating and Editing Graphics, Image and Text Type Setters

UNIT – II:

Preparation of Newsletter: Starting Page maker, Designing the layout placing the lead Article, Placing more articles, Printing the Publication

UNIT – III:

Business Reports and Manuals: Preparation of Annual Business Report, Printing the Report using different devices, Technical manual, Designing the pages, Preparing and Placing Text and Graphics

UNIT – IV:

Advanced Design & Tips: Wrapping text around Graphics, Enlarging Essential Capital, Mixing Column Layouts Reverse type, Fancy Titles and Headlines, Rules, borders and boxes Layouts with Colour, Special Layouts, Few tips and Techniques

TEXT BOOK:

1. Desktop Publishing with PageMaker by Tony Bave & Cheryl Rhoder, John Wiley & Sons Publication.

MCA17403P: DATA MINING & DATA WAREHOUSING LAB

1. Demonstration of preprocessing on dataset student.arff
2. Demonstration of preprocessing on dataset labor.arff
3. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means
10. Demonstration of clustering rule process on dataset student.arff using simple kmeans

MCA17404P COMPUTER NETWORKS LAB

1. Implement the data link layer framing methods such as character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
3. Write a program for selective report ARQ
4. Write a program using Go Back NARQ method.
5. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
6. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
7. Take an example subnet of hosts. Obtain broadcast tree for it.

MCA17407P: MINI PROJECT



VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Fifth Semester	MCA17501	.NET Technologies	Core	4	3	1	0	4	30	70	100
	MCA17502	1. Geographical Information Systems & Cyber Security 2. Cryptography & Network Security 3. Wireless and AdHoc Networks 4. Mobile Application Development	Generic Elective	4	3	1	0	4	30	70	100
	MCA17503	1. Big Data Analytics 2. Natural Language Processing 3. Programming using 'R' 4. Advanced Database Management Systems	Generic Elective	4	3	1	0	4	30	70	100
	MCA17504	1. Cloud Computing 2. Mathematical Modeling & Simulation 3. Machine Learning 4. Virtual Technologies	Generic Elective	4	3	1	0	4	30	70	100
	MCA17505	1. Artificial Intelligence 2. Neural Networks 3. Internet Of Things 4. Image Processing using MATLAB	Generic Elective	4	3	1	0	4	30	70	100
	MCA17506	Leadership Skill & Group Discussion		2	2	0	0	2	50	0	50
	MCA17501P	.NET Technologies Lab		2	0	0	4	4	30	70	100
	MCA17503P	Elective Lab		2	0	0	4	4	30	70	100
	MCA17505P	Elective Lab		2	0	0	4	4	30	70	100
Total				28	17	5	12	34	290	560	850

Course Structure for Master of Computer Applications for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year



VIKRAMA SIMHAPURI UNIVERSITY:: NELLORE

Syllabus for Master of Computer Applications for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

MCA17501: .NET TECHNOLOGIES

UNIT - I:

FUNDAMENTALS OF VISUAL BASIC: Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels. (Chapters 1 to 7)

UNIT - II:

WINDOWS FORMS: Different types of Bars, Menus, Views.

OBJECT - ORIENTED PROGRAMMING: Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, Vate Binding, Graphics handling and File handling. (Chapters 8 to 13)

UNIT - III:

WEB FORMS: Working with web forms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. (Chapters 14 to 19)

UNIT - IV:

DATA ACCESS WITH ADO.NET : Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases, Handling databases in code, Database access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 30 to 25)

TEXT BOOK:

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 3003)

REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvosrson (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynold Hacrtte (PHI)

ELECTIVE: MCA17502 1. GEOGRAPHICAL INFORMATION SYSTEMS & CYBER SECURITY

UNIT - I:

Defining GIS, The uses of GIS, Socioeconomic challenges, an overview of the GIS industry and GIS softwares, Functions of GIS, Benefits of computerizing information, Users of GIS.

UNIT - II:

Planning a GIS, Implementing a GIS, Selecting a GIS, Types of GIS analysis, Location based services, Representing geographical information systems, Generalization of GIS, Integration of GIS, A case study in GIS implementation, Digital Map making.

UNIT - III:

Fundamentals & Issues In Cyber Security - Introduction, Cyber Security and its problem-Intervention Strategies: Redundancy, Diversity and Autarchy, Private ordering solutions, Regulation and Jurisdiction for global Cyber security, Copy Right-source of risks, Pirates, Internet Infringement, Fair Use, postings, criminal liability, First Amendments, Data Loss.

UNIT - IV:

Intellectual Property Rights - Copy Right-Source of risks, Pirates, Internet Infringement, Fair Use, postings, Criminal Liability, First Amendments, Losing Data, Trademarks, Defamation, Privacy-Common Law Privacy, Constitutional law, Federal Statutes, Anonymity, Technology expanding privacy rights.

Procedural Issues - Duty of Care, Criminal Liability, Procedural issues, Electronic Contracts & Digital Signatures, Misappropriation of information, Civil Rights, Tax, and Evidence.

TEXT BOOKS:

1. Geographical Information Systems- Anil K.Jamwal
2. Geographical Information Systems an Introduction-Second Edition- Tor Bernhardsen
3. Geographical Information Systems- Sabhah Mehtani, Amarjit Snha
4. Jonathan Rosenoer, "Cyber Law: The law of the Internet", Springer-Verlag, 1997.

REFERENCE BOOK:

1. Mark F Grady, Fransesco Parisi, "The Law and Economics of Cyber Security", Cambridge University Press, 2006.

ELECTIVE: MCA17502 2. CRYPTOGRAPHY & NETWORK SECURITY

UNIT - I:

INTRODUCTION:- Attacks, Services, and Mechanisms, Security Services.

CONVENTIONAL ENCRYPTION: Classical Techniques: Steganography, Classical Encryption Techniques.

CONVENTIONAL ENCRYPTION: MODERN TECHNIQUES:- Simplified DES, The Data Encryption Standard, Differential and Linear Cryptanalysis, Block Cipher Modes of Operation, Triple DES, Blowfish.

UNIT - II:

CONFIDENTIALITY USING CONVENTIONAL ENCRYPTION: Traffic Confidentiality, Random Number Generation.

PUBLIC-KEY CRYPTOGRAPHY:- Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography.

INTRODUCTION TO NUMBER THEORY: Prime and Relatively Prime Numbers, Fermat's and Euler's Theorem, Euclid's Algorithm, The Chinese Remainder Theorem, Discrete Logarithms, Hash functions, Security of hash functions and MACs.

UNIT - III:

DIGITAL SIGNATURES AND AUTHENTICATION PROTOCOLS: Digital Signatures, Authentication Protocols, Digital Signature Standard.

E-MAIL SECURITY:- Complete Email system, Email Security, Pretty Good Privacy(PGP), MIME, S/MIME.

UNIT - IV:

IP SECURITY: IP Security Overview, IP Security Architecture, Encapsulating Security Payload, Key Management. **FIREWALLS:** Firewall Design Principles, Trusted Systems.

WEB SECURITY: Web Security Threats, Web Traffic Security approaches, Security Socket Layer, SSL Record Protocol, Transport layer security, Secure Electronic Transaction(SET)

TEXT BOOK:

1. Cryptography And Network Security principles and Practice FOURTH Edition By Willam Stallings (Pearson Asia)

REFERENCE BOOKS:

1. Davies & Price : Security For Computer Networks - Wiley (1984)
2. Network Security and Cryptography, N. Sridhar & R.Siva Ranjani, HI – Tech Publishers (2005)
3. Mayer & Matyas : Cryptography – Wiley B. Schneier : Applied Cryptography - (John Wiley)
4. Cryptography In C And C++ :Weischanbach – A Press
5. Cryptography Mystified: Hershey
6. Introduction to cryptography BY J A Buchanan (Springer)

ELECTIVE: MCA17502 3. WIRELESS AND ADHOC NETWORKS

UNIT - I:

INTRODUCTION: Introduction to Wireless Networks, Various Generations of Wireless Networks, Virtual Private Networks- Wireless Data Services, Common Channel Signaling, Various Networks for Connecting to the Internet, Blue tooth Technology, Wifi-WiMax- Radio Propagation mechanism , Pathloss Modeling and Signal Coverage

WIRELESS LOCAL AREA NETWORKS: Introduction-WLAN topologies-IEEE 802.11 Standards , MAC Protocols, Comparison of 802.11 a,b,g and n Standards, HIPER LAN , ZigBee 802.15.4, Wireless Local Loop

UNIT - II:

WIRELESS ADHOC NETWORKS: Basics of Wireless Networks, Infrastructured Versus Infrastructureless Networks – Properties of Wireless, AD hoc Networks, Types of Ad Hoc Networks, Challenges in AD Hoc Networks –Applications of Wireless AD Hoc Networks

ROUTING PROTOCOLS FOR AD HOC NETWORKS: Introduction-Proactive Routing Protocols- Reactive Routing protocols-Hybrid Routing Protocols-QoS Metrics-Energy impact issues in Routing.

UNIT - III:

MOBILE AD HOC NETWORKS (MANETS): Overview, Properties of A MANET, Spectrum of MANET Applications, Routing and Various Routing Algorithms.

OTHER WIRELESS TECHNOLOGIES: Introduction, IEEE 802.15.4 and Zigbee, General Architecture, Physical Layer, MAC layer, Zigbee, WiMAX and IEEE 802.16, Layers and Architecture, Physical Layer, OFDM Physical layer.

UNIT - IV:

SECURITY IN AD HOC NETWORKS: Introduction- Security Attacks, Intrusion Detection System, Intrusion Prevention system, Intrusion Response system, Wired Equivalent Privacy(WEP) -A Security Protocol for Wireless Local Area Networks (WLANs), Security in MANETs.

TEXT BOOKS:

1. Principles of Wireless Networks , Kaveth Pahlavan, K. Prasanth Krishnamurthy, Pearson Publications, Asia, 2002
2. Mobile Cellular Communications, G.Sasibhusan Rao, “”, Pearson Publications.

REFERENCES:

1. Guide to Wireless Ad Hoc Networks: Series: Computer Communications and Networks, Misra, Sudip; Woungang, Isaac; Misra, Subhas Chandra, 2009, Springer 48

ELECTIVE: MCA17502 4. MOBILE APPLICATION DEVELOPMENT

UNIT - I:

Preliminary Considerations - Why You Might Be Here, Cost of Development, Importance of Mobile Strategies In The Business World, Why Is Mobile Development Difficult?, Mobile Development Today, Mobile Myths, Third-Party Frameworks.

Diving Into Mobile: App or Website - Mobile Web Presence, Mobile Applications, Marketing, Your App as a Mobile Web App

Creating Consumable Web Services for Mobile Devices - What Is a Web Service, Web Services Languages (Formats), Creating an Example Web Service, Debugging Web

UNIT - II:

Mobile User Interface Design - Effective Use of Screen Real Estate, Understanding Mobile Application Users, Understanding Mobile Information Design, Understanding Mobile Platforms, Using the Tools of Mobile Interface Design

Mobile Websites - Choosing a Mobile Web Option, Adaptive Mobile Websites, Dedicated Mobile Websites, Mobile Web Apps with HTML5

UNIT - III:

Getting Started With Android- Why Target Android, Who Supports Android, Android as Competition to Itself, Getting the Tools You Need, Connecting to the Google Play, Android Development Practices, Building the Derby App in Android

Getting Started With IOS - The iPhone Craze, Getting the Tools You Need, iOS Project, Debugging iOS Apps, Objective-C Basics, Hello World App, Building the Derby App in iOS, Other Useful iOS

UNIT - IV:

Getting Started With Windows Phone 7 - New Kid on the Block, Getting the Tools You Need, Building the Derby App in Windows Phone 7, Distribution, Other Useful Windows Phone Things

Getting Started With PhoneGap - History of PhoneGap, Why Use PhoneGap, Who Is Using PhoneGap, Differences between PhoneGap and HTML5, Getting the Tools You Need, PhoneGap Project, Building the Derby App in PhoneGap, Other Useful Phone Gap Things, Connecting PhoneGap to the Markets

TEXT BOOK: 1. Professional Mobile Application Development by Jeff McWherter, Scott Gowell

ELECTIVE: MCA17503 1. BIG DATA ANALYTICS

UNIT - I:

INTRODUCTION TO BIG DATA: Big Data-definition, Characteristics of Big Data (Volume, Variety, Velocity, Veracity, Validity), Importance of Big Data , Patterns for Big Data Development, Data in the Warehouse and Data in Hadoop,

INTRODUCTION TO HADOOP: Hadoop- definition, Understanding distributed systems and Hadoop, Comparing SQL databases and Hadoop, Understanding MapReduce, Counting words with Hadoop—running your first program, History of Hadoop, Starting Hadoop - The building blocks of Hadoop, NameNode, DataNode, Secondary NameNode, JobTracker and Task Tracker

UNIT - II:

MAPREDUCE -A Weather Dataset, Analyzing the Data with Unix Tools, Analyzing the Data with Hadoop, Scaling Out, Hadoop Streaming, Hadoop Pipes, Developing a MapReduce Application - The Configuration API, Configuring the Development Environment, Running Locally on Test Data, Running on a Cluster, Tuning a Job, MapReduce Workflows

UNIT - III:

HDFS: Components of Hadoop -Working with files in HDFS, Anatomy of a MapReduce program, Reading and writing the Hadoop Distributed File system -The Design of HDFS, HDFS Concepts, The Command-Line Interface, Hadoop Filesystem, The Java Interface, Data Flow, Parallel Copying with distcp, Hadoop Archives

MAPREDUCE PROGRAMMING: Writing basic Map Reduce programs - Getting the patent data set, constructing the basic template of a Map Reduce program, Counting things, Adapting for Hadoop's API changes, Streaming in Hadoop, Improving performance with combiners.

UNIT - IV:

MAPREDUCE ADVANCED PROGRAMMING: Advanced MapReduce - Chaining MapReduce jobs, joining data from different sources, creating a Bloom filter, Passing job-specific parameters to 49 your tasks, probing for task-specific information, Partitioning into multiple output files, Inputting from and outputting to a database, keeping all output in sorted order

GRAPH REPRESENTATION IN MAPREDUCE: Modeling data and solving problems with graphs, Shortest Path Algorithm, Friends-of-Friends Algorithm, PageRank Algorithm, Bloom Filter, Parallelized Bloom filter creation in MapReduce, Map-Reduce semi-join with Bloom filters

TEXTBOOKS:

1. Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch ,“Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data”, 1st Edition, TMH,2012.
2. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly

REFERENCE BOOKS:

1. Hadoop in Action by Chuck Lam, MANNING Publ.
2. Hadoop in Practice by Alex Holmes, MANNING Publishers
3. Mining of massive datasets, Anand Rajaraman, Jeffrey D Ullman, Wiley Publications.

ELECTIVE: MCA17503 2. NATURAL LANGUAGE PROCESSING

UNIT - I

Introduction to Natural Language Understanding, Syntactic Processing: Grammars and Parsing.

UNIT - II

Features and Augmented Grammars, Toward Efficient Parsing, Ambiguity Resolution.

UNIT- III

Statistical Methods: Probabilistic Context-Free Grammars, Best-First Parsing.

UNIT - IV

Semantic Interpretation: Linking Syntax and Semantics, Strategies for Semantic Interpretation.

Context and World Knowledge: Using World Knowledge, Discourse Structure, Defining a Conversational Agent.

TEXT BOOK:

1. Natural Language Understanding – James Allen, Second Edition, Pearson Education.

REFERENCE BOOKS:

1. Speech and Language Processing – Daniel Jurafsky, James H.Martin.
2. Foundations of Statistical Natural Language Processing – Christopher Manning, Hinrich Schutze, MIT Press.

ELECTIVE: MCA17503 3. PROGRAMMING USING ‘R’

UNIT-I:

Introduction, what is R, Basic Features of R, Design of the R System, Limitation of R, R Nuts & Bolts How to run R, R Sessions and Functions, Basic Math, Getting data in and out of R, Reader Packages, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes.

UNIT-II:

R Programming Structures, Control Statements, Loops, - Looping Over Nonvector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion, A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.

UNIT-III:

Doing Math and Simulation in R, Math Function, Extended Example Calculating Probability- Cumulative Sums and Products-Minima and Maxima- Calculus, Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains, Set Operation, Input /out put, Accessing the Keyboard and Monitor, Reading and writer Files,

UNIT-IV:

Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot() Function – Customizing Graphs, Saving Graphs to Files.

TEXT BOOKS:

1. The Art of R Programming, A K Verma, Cengage Learning.
2. R for Everyone, Lander, Pearson
3. The Art of R Programming, Norman Matloff, No starch Press.

REFERENCE BOOKS:

1. R Cookbook, Paul Teetor, Oreilly.
2. R in Action, Rob Kabacoff, Manning
3. R Programming for Data Science, Roger D. Peng Lean Publishing.

ELECTIVE: MCA17503 4 . ADVANCED DATABASE MANAGEMENT SYSTEMS

UNIT – I:

ENHANCED ENTITY-RELATIONSHIP AND OBJECT MODELING: Subclasses, Super classes, and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization, Modeling of UNION Types Using Categories, An Example UNIVERSITY ERR Schema and Formal Definitions for the ERR Model, Conceptual Object Modeling Using UML Class Diagrams, Relationship Types of Degree Higher Than Two, Data Abstraction and Knowledge Representation Concepts Relational Database Design Using ER-to-Relational Mapping, Mapping ERR Model Concepts to Relations

UNIT – II:

CONCEPTS FOR OBJECT-ORIENTED DATABASES: Overview of Object-Oriented Concepts, Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type Hierarchies and Inheritance. Overview of the Object Model of ODMG, The Object Definition Language. Object-Relational Features of Oracle, An Overview of SQL3, Implementation and Related Issues for Extended Type Systems, The Nested Relational Data Model.

UNIT – III:

STORAGE AND INDEXING: OVERVIEW OF STORAGE AND INDEXING - Data on External Storage, File organizations and Indexing, Index Data Structures, Comparison of File Organizations.
STORING DATA: DISKS AND FILES - The Memory Hierarchy, Redundant Arrays of Independent Disks, Disk Space Management, Buffer Manager, Files of Records, Page Formats, Record Formats.

UNIT – IV:

TREE - HASH INDEXING: TREE - STRUCTURED INDEXING - Intuition For Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete, Duplicates, B+ Trees in Practice.

HASH-BASED INDEXING - Static Hashing, Extendible Hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS

1. Fundamentals of DataBase Management Systems by Navate & Elmasri (IV Edition)
2. DataBase Management System (III Edition) by Raghu Ramakrishna and J.Gehrke

REFERENCE BOOKS

1. Fundamentals of Database Systems (Third edition) by - Elmasri & Navathe (Pearson Education 3002)
2. Database system concepts (iv edition) by - Silber Schatz, Korth G. Sudarshan

ELECTIVE: MCA17504 1. CLOUD COMPUTING

UNIT – I:

INTRODUCTION TO CLOUD COMPUTING – Introduction, Characteristics of Cloud Computing, Cloud Models, Cloud Services Examples, Cloud – based Services & Applications

CLOUD CONCEPTS & TECHNOLOGIES – Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Network Function Virtualization, MapReduce, Identity and Access Management, Service Level Agreements, Billing

UNIT – II:

CLOUD SERVICES & PLATFORMS - Compute Services, Storage Services, Database Services, Application Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software

DEVELOPING FOR CLOUD – Cloud Application Design, Reference Architectures for cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches

UNIT – III:

BIG DATA ANALYTICS – Introduction, Clustering Big Data, Classification of Big Data

UNIT – IV:

MULTIMEDIA CLOUD – Introduction, Case Study: Live Video Streaming App, Streaming Protocols, Case Study: Video Transcoding App

CLOUD APPLICATION BENCHMARKING & TUNING – Introduction, Workload characteristics, Application Performance Metrics, Design Considerations for a Benchmarking Methodology, Benchmarking Tools, Deployment Prototyping, Load Testing & Bottleneck Detection Case Study, Hadoop Benchmarking Case Study

CLOUD SECURITY – Introduction, CSA Cloud Security Architecture, Authentication, Authorization, Identity & Access Management, Data Security, Key Management, Auditing

TEXT BOOK:

1. Cloud Computing A Hands-on Approach by Arshdeep Bahga, Vijay Madiseti

ELECTIVE: MCA17504 2. MATHEMATICAL MODELING AND SIMULATION

UNIT – I:

Mathematical Modeling: Introduction, Modeling Types, Quick Review, First order differential Equations, Second order differential Equations, Linear Algebra, Scaling, Cascades of Compartments, Parameter units

UNIT – II:

Mathematical Analysis Tools & Bifurcation: Stability Analysis, Phase Plane behavior, Direction Field, Routh- Hurwitz criteria, Transcritical & Saddle-Node, Pitchfork, Hopf Bifurcation with examples

UNIT – III:

Mathematical Methods & Stochastic modeling: Discretization, Euler Method, Non Standard Methods, Field Print Analysis, Stochastic Process, Probability Generating Function, Markov Charts and Random Walks

UNIT – IV:

Computer Simulation and Computer Softwares: Deterministic Structure, Stochastic Structure, Monte Carlo Method, Simulation Packages, Classification Simulation Software, General Purpose Vs Application Oriented Simulation Packages, Modeling Approaches

TEXT BOOKS:

1. Mathematical Modeling: A Graduate TextBook, Seyad M. Moghadas, Majid. Jaber-Douraki – E-Book, Wiley Publication
2. Simulation Modeling Analysis, Averiel M Law, IV Edition, THM

ELECTIVE: MCA17504 3. MACHINE LEARNING

UNIT I: INTRODUCTION

Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning. Concept learning and the general to specific ordering – Introduction, A concept learning task, Concept learning as search, Find- S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias.

UNIT II: LINEAR REGRESSION & LOGISTIC REGRESSION

Predicting numeric values: regression - Finding the best fit lines with linear regression, Locally weighted linear regression, Shrinking Coefficients, The bias / Variance tradeoff.

Logistic Regression: Classification with logistic regression and the sigmoid function, Using optimization to find the best regression coefficients.

UNIT III: EVALUATION HYPOTHESES

Evaluation Hypotheses: Motivation, Estimation hypothesis accuracy, Basics of sampling theory, a general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms.

UNIT IV: SUPPORT VECTOR MACHINES & GENETIC ALGORITHMS

Support vector machines: Separating data with the maximum margin, finding the maximum margin, efficient optimization with SMO algorithm, speeding up optimization with full platt SMO, Using Kernels for more Complex data.

Genetic Algorithms: Representing Hypotheses, Genetic Operators, Fitness Function and Selection, Illustrative Example.

TEXT BOOKS:

1. Machine Learning ,Tom M. Mitchell, MGH
2. Machine Learning in Action, Peter Harington, 2012, Cengage.`

REFERENCE BOOK:

1. Introduction to Machine Learning, Ethem Alpaydin, PHI, 2004

ELECTIVE: MCA17504 4. VIRTUAL TECHNOLOGIES

UNIT - I:

OVERVIEW OF VIRTUALIZATION: System architectures - Virtual Machine basics - Process vs System Virtual Machines - Taxonomy. Emulation: Basic Interpretation - Threaded Interpretation - Pre-coded and Direct Threaded Interpretation - Binary Translation. System Virtual Machines - Key concepts - Resource utilization basics.

UNIT - II:

PROCESS VIRTUAL MACHINES: Implementation – Compatibility – Levels – Framework – State Mapping – Register – Memory Address Space – Memory Architecture Emulation – Memory Protection – Instruction Emulation – Performance Tradeoff - Staged Emulation – Exception Emulation – Exception Detection – Interrupt Handling – Operating Systems Emulation – Same OS Emulation – Different OS Emulation – System Environment.

UNIT - III:

HIGH LEVEL LANGUAGE VIRTUAL MACHINES AND SERVER VIRTUALIZATION: Virtual machines: Pascal P-Code – Object Oriented HLLVMs - Java VM architecture - Java Native Interface - Common Language Infrastructure. Server virtualization: Partitioning techniques - virtual hardware - uses of virtual servers - server virtualization platforms

UNIT - IV:

NETWORK AND STORAGE VIRTUALIZATION: Design of Scalable Enterprise Networks – Layer2 Virtualization – VLAN - VFI - Layer 3 Virtualization – VRF - Virtual Firewall Contexts - Network Device Virtualization - Data- Path Virtualization - Routing Protocols. Hardware Devices – SAN backup and recovery techniques – RAID – Classical Storage Model – SNIA Shared Storage Model – Virtual Storage: File System Level and Block Level 31

REFERENCES:

1. James E. Smith, Ravi Nair, “Virtual Machines: Versatile Platforms for Systems and Processes”, Elsevier/Morgan Kaufmann, 2005.
2. David Marshall, Wade A. Reynolds, “Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center”, Auerbach Publications, 2006.
3. Kumar Reddy, Victor Moreno, “Network virtualization”, Cisco Press, July, 2006.
4. Chris Wolf, Erick M. Halter, “Virtualization: From the Desktop to the Enterprise”, APress 2005.
5. Kenneth Hess , Amy Newman, “Practical Virtualization Solutions: Virtualization from the Trenches”, Prentice Hall, 2010

ELECTIVE: MCA17505 1. ARTIFICIAL INTELLIGENCE

UNIT - I:

Introduction about Artificial Intelligence(AI), Problem and search-What is AI Technique, Criteria for success, Problems Space and Search, State Space Search, Production systems, Problem Characteristics, Production system Characteristics.

UNIT - II:

Heuristic search techniques, knowledge representation issues, Prediction logic, Resolution principle, Representing knowledge using rules, forward vs backward reasoning, semantic reasoning under uncertainty- Non monotonic reasoning, Statistical reasoning. Different knowledge representation schemes-Semantic nets, Minsky's frames. Conceptual dependency theory, scripts, Waltz's algorithm.

UNIT - III:

Natural Language processing-Overview of linguistics, Grammars and languages, Basic parsing techniques, Transitional networks, Semantic analysis and representation structures, Natural language generation, Natural language systems; General concepts in knowledge acquisition-types of learning, General learning model, Performance measures.

UNIT – IV:

Expert system architecture- Characteristic feature of expert systems, History, Applications, Rule based system architecture, Expert system shells; Pattern recognition-The recognition and classification process, Learning classification patterns, Recognizing and understanding speech; Perception and Action; Features of AI Programming Language PROLOG.

TEXT BOOKS:

1. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata Mcgraw Hill 2nd edition, 2002.
2. Dan W.Patterson, “Introduction to Artificial Intelligence & Expert Systems” , PHI, 1999.

REFERENCE BOOKS:

1. Patrick Hendry Winston, “Artificial Intelligence”, 3rd edition, PHI, 1999.
2. George F. Luger, “Artificial Intelligence- Structured and strategies for complex problem solving” , Pearson education, 4th edition, 2001.

ELECTIVE: MCA17505 2. NEURAL NETWORKS

UNIT - I

Introduction to Neural Networks: Biological neuron, McCulloch-pitts neuron model, Neuron Modelling for Artificial Neural Systems, Models of Artificial Neural Networks-feed forward and feedback networks, Neural Processing, Learning as approximation, Supervised and unsupervised learning, Neural Network Learning rules-Hebbian, Perceptron, Delta, Widrow-Hoff, Correlation, Winner-Take-All learning rules.

UNIT - II

Single-Layer Neural Networks: Classification Model, Features and Decision Regions, Discriminant Functions, Linear Machine and Minimum Distance Classification, Training and Classification using Discrete Perceptron, Single-Layer Continuous Perceptron Networks, Multicategory Single-Layer Perceptron Networks, Hopfield Network – Discrete-time, Gradient type.

UNIT - III

Multi-Layer Neural Networks: Linearly Nonseparable Pattern Classification, Delta Learning Rule for Multiperceptron Layer, Generalized Delta Learning Rule, Feed forward Recall and Error Back propagation training, Learning Factors.

UNIT - IV

Associative Memories: Basic concepts, Linear Associator, Recurrent Auto associate Memory, Performance Analysis of Recurrent Auto associate Memory, Bidirectional Associate Memory (BAM): Memory Architecture, Association Encoding and Decoding, Stability Considerations, Memory Example and Performance Evaluation, Improved coding of memories, Multidirectional Associative Memory, Associative Memory of Spatio-Temporal Patterns.

TEXT BOOK:

1. JacekM.Zurada,” Introduction to Artificial Neural Systems”, West Publishing Company

EFERENCE BOOKS:

1. S.N.Sivanandam, S.Sumathi, S.N.Deepa, “Introduction to Neural Networks using MATLAB6.0”, TMH, 2006.
2. Simon Haykins, “Neural Networks”, Pearson Education.

ELECTIVE: MCA17505 3. INTERNET OF THINGS

UNIT - I:

INTRODUCTION TO INTERNET OF THINGS –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT Communication Models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyle

UNIT - II:

IOT AND M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANGNETCONF, YANGSNM NETOPEER

UNIT - III:

INTRODUCTION TO PYTHON - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

UNIT - IV:

IOT PHYSICAL DEVICES AND ENDPOINTS - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins

IOT PHYSICAL SERVERS AND CLOUD OFFERINGS – Introduction to Cloud Storage models and communication APIs Webservice – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547 2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

ELECTIVE: MCA17505 4. IMAGE PROCESSING Using MAT LAB

UNIT - I:

DIGITAL IMAGE FUNDAMENTALS: What is digital image processing, Examples of fields that use digital image processing, Fundamental steps in digital image processing, Components of image processing system, Image sampling and quantization, some basic relationships between pixels linear and Non-linear operators.

UNIT - II:

IMAGE ENHANCEMENT: Image enhancement in the spatial domain: Some basic gray level transformation, Histogram processing, Enhancement using arithmetic and logic operations, Basics of spatial filters, smoothing and sharpening spatial filters, combining spatial enhancement methods.

UNIT - III:

IMAGE COMPRESSION: Fundamentals, Image compression models, Elements of information theory, Error free compression, Lossy compression, Image compression standards- Huffman, Golombo, arithmetic, LZW, Run-length, Block transform coding.

MORPHOLOGICAL IMAGE PROCESSING: Preliminaries, Dilation, Erosion, Open and Closing, Hit transformation, Basic morphologic algorithms

UNIT - IV:

COLOR IMAGE PROCESSING: Color fundamentals, Color models- RGB color model, CMY and CMYK color models, HIS color model, and Basics of full color image processing, smoothing and sharpening.

SEGMENTATION: Thresholding, Edge Based Segmentation: Edge Image Thresholding, Region Based Segmentation, Matching.

REPRESENTATION AND DESCRIPTION: Representation, Boundary Descriptor, Regional Descriptors.

TEXT BOOKS:

1. "Digital Image Processing", Rafael C.Gonzalez and Richard E. Woods, Third Edition, Person Education 2007.
2. "Digital Image Processing", S. Sridhar, Oxford University Press.

REFERENCE BOOKS:

1. "Fundamentals of Digital Image Processing", S. Annadurai, Person Edun, 2001.
2. "Digital Image Processing Analysis", B. Chanda and D. Dutta mnjumdar, PHI, 2003.
- 3."Image Processing Analysis and Machine Vision", Milan Sonka, Veclav Hlavac and Roger Boyle, 2nd Edition, Thomson Learning, 2001.
4. "Digital Image Processing", Vipula Singh, Elsevier.

MCA17506: LEADERSHIP SKILL & GROUP DISCUSSION

UNIT - I:

CONCEPT AND NATURE OF LEADERSHIP: concept and Significance, Importance, evaluations of leadership, Leadership at different levels, Leadership and Gender, Male and Female Leadership styles.

UNIT - II:

LEADERSHIP QUALITIES: List of Qualities, Charismatic Leadership, working leader, psychopathology of leadership

UNIT - III:

LEADERSHIP IN GROUPS: groups, teams, group vs. teams and team formation process, stages of group, group dynamics, and managing team performance & team conflicts.

UNIT - IV:

LEADERSHIP ETHICS: Definition, ethical theories, principles of ethical leadership, core leadership values : respect, making a difference, integrity, authenticity, courage, service, humility, wisdom.

LEADERSHIP VALUES ACROSS GLOBE: leader vs. manager, leadership in India, china and America.

TEXT BOOKS:

1. **Leadership- Philip Sadler**, Fast Track Series, Crest Publishing House.
2. Leadership and Management – Dr. A. Chandra Mohan, Himalaya Publishing House
3. **John C. Maxwell (2014)**; “The 5 Levels of Leadership”, Centre Street, A division of Hachette Book Group Inc.

1. Write a VB .NET console application for the function overloading?
2. Write a VB .NET console application for the function overriding?
3. Write a VB .NET console application program to process student details?
4. Write a VB .NET console application program for sorting of an elements?
5. Write a VB .NET console application program for searching an element?
6. Write a VB .NET windows interface to demonstrate normal calculator in VB .NET?
7. Write a VB .NET console application program for File Handling?
8. Write a VB .NET windows application program for Data base connectivity?

1. Write a Python Program to print the Multiplication table for the given number?
2. Write a Python Program to check whether the given number is Prime or not?
3. Write a Python Program to find Factorial of the given number?
4. Write a Python Program to implement Breadth First Search Traversal?
5. Write a Python Program to implement Water Jug Problem?
6. Write a Python Program to remove stop words for a given passage from a text file using NLTK?
7. Write a Python Program to implement stemming for a given sentence using NLTK?
8. Write a Python Program to POS (Parts of Speech) tagging for the give sentence using NLTK?
9. Implement linear regression algorithm of machine learning.
10. . Brute Force solution to the Knapsack problem.
11. . WAP in turbo prolog for medical diagnosis and show t he advantage and disadvantage of green and red cuts.
12. Write simple fact for following:
 - a. Ram likes mango.
 - b. Seema is a girl.
 - c. Bill likes Cindy.
 - d. Rose is red.
 - e. John owns gold.

1. Create a relational hierarchy table to display emp names based on
MGR(MURALI(1000),SMITH(9000),ALLEN(9001),WARD(8000),MARTIN(8001),TURNER(6000),JAMES(6001).
2. Write a pl/sql program to count number of characters and words in a given string.
3. Create a student table to display total marks and percentage.
4. Write a program to display Year Calendar by using TRUNC command.
5. Write a pl/sql program to satisfy the ELSE IF condition?
6. Write a pl/sql program to print an indexed element from the Array.
7. Write a pl/sql program to swap two numbers without taking third Variable.
8. Write a pl/sql program to modify views using Instead of Triggers.
9. Implementing operation on Relation using SQL.
10. Write a pl/sql program to print different types of Patterns.
11. (A) Write a pl/sql program for Fibonacci series.
(B) Write a pl/sql program for Palindrome number.
12. (A) Write a pl/sql program to find Greatest of Three numbers.
(B) Write a pl/sql program to check the given number is Even or odd.

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Sixth Semester	MCA17601	Major Project Work	Core	12	0	0	0	0	100	200	300
Total				12	0	0	0	0	100	200	300



VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

Course Structure for Master of Computer Applications for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

S.No	Semester	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
1	First Semester	28	17	5	12	34	270	630	900
2	Second Semester	28	17	5	12	34	270	630	900
3	Third Semester	28	17	5	12	34	240	660	900
4	Fourth Semester	28	17	5	12	34	240	660	900
5	Fifth Semester	28	17	5	12	34	290	560	850
6	Sixth Semester	12	0	0	0	0	100	200	300
Total		152	85	25	60	170	1410	3340	4750

S.No	Semester	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
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Open Elective

Second Semester	<p>Courses offered to other Departments by the Computer Science Department</p> <ol style="list-style-type: none"> 2. Foundation in Computer Applications 3. PC Hardware & Office Automation Techniques Lab 4. Internet Foundation
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Open Elective

Fourth Semester	<p>Courses offered to other Departments by the Computer Science Department</p> <ol style="list-style-type: none"> 1. Programming in C 2. Programming in Visual Basic 3. Desktop Top Publishing(DTP)
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VIKRAMA SIMHAPURI UNIVERSITY COLLEGE
DEPARTMENT OF COMPUTER SCIENCE
KAKUTUR - 524 320, S. P. S NELLORE (Dt)
Model Question Papers

Time: 3 Hours
Max. Marks: 70

PART – A

Answer any FOUR questions from Part –A each question carries 5 Marks 4X5M = 20M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

PART-B

Answer all questions from Part –B each question carries 12.5 Marks
4X12.5M = 50M

9. (A) UNIT - I

OR

(B)

UNIT - II

10. (A)

OR

(B) .

UNIT - III

11. A)

OR

(B)

UNIT - IV

12. A)

OR

(B)