



**Swami Ramanand Teerth Marathwada University, Nanded**  
**Choice Based Course Credit System (distribution and details of CBCS System)**  
**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc. (CM) Second Year (Two Semesters)**

| <b>Semester-III</b>  |   |                        |                        |                      |                             |
|----------------------|---|------------------------|------------------------|----------------------|-----------------------------|
| <b>Course Code</b>   | <b>Title of the paper</b>   | <b>External credit</b> | <b>Internal credit</b> | <b>Total Credits</b> | <b>Total Nor of Classes</b> |
| M.SC. CM-301         | Java Programming  | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-302         | Operation Research  | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-303         | Visual Basic.Net  | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-304         | Software Testing Tools  | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-305         | <b>Elective - III</b><br>1. Advanced Operating System<br>2. JavaScript<br>3. PHP & My SQL | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-306         | Lab-1 (Java Prog. VB.Net)   | 1                      | 1                      | 2                    | 60hrs                       |
| M.SC. CM-307         | Lab-2 (Software Testing Tools)  | 1                      | 1                      | 2                    | 60hrs                       |
| M.SC. CM-308         | Seminar   | 0                      | 1                      | 1                    |                             |
| <b>Total Credits</b> |   | <b>18</b>              | <b>7</b>               | <b>25</b>            |                             |

| <b>Semester-IV</b>   |   |                        |                        |                      |                             |
|----------------------|---|------------------------|------------------------|----------------------|-----------------------------|
| <b>Course Code</b>   | <b>Title of the paper</b>   | <b>External credit</b> | <b>Internal credit</b> | <b>Total Credits</b> | <b>Total Nor of Classes</b> |
| M.SC. CM-401         | Linux Operating System & Administration   | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-402         | Web Page Design & Active Server Pages 3.0   | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-403         | Network Management  | 3                      | 1                      | 4                    |                             |
| M.SC. CM-404         | Software Project Management   | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-405         | <b>Elective-IV</b><br>1. ORACLE DBA<br>2. Distributed Database Concepts<br>3. Data Mining | 3                      | 1                      | 4                    | 40hrs                       |
| M.SC. CM-406         | Lab-1 (Linux OS & Adm. + WPD & ASP)   | 1                      | 1                      | 2                    | 60hrs                       |
| M.SC. CM-407         | Lab-2 (Project Work)  | 1                      | 1                      | 2                    |                             |
| M.SC. CM-408         | Open Elective   | 0                      | 1                      | 1                    |                             |
| <b>Total Credits</b> |   | <b>18</b>              | <b>7</b>               | <b>25</b>            |                             |



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**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc. CM-301**

**JAVA Programming**

**(4 Credits)**

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**UNIT I: Introduction to Java,**

An Overview of Java, Java Applets and Application, Difference between Java and Java Script , Object Oriented Programming Features, Data Types , Java Token and Keywords , Declaring a variable, dynamic initialization, The scope and Life time of Variable, Type Conversion and Casting, Arrays: One-Two-Multidimensional Arrays.

**UNIT II: Operators and Control Statements**

Arithmetic Operators , The Bitwise Operators , Relational Operators , The Assignment Operators, the ?: Operator ,Operator Precedence , Selection Statements , Iteration Statements , Jump Statements

**UNIT III: Introduction to Classes and Objects, Inheritance, package and interface**

Class Fundamental , Declaring Object, Assigning Object Reference Variable, Introducing Methods, Constructors , Garbage Collection, The finalize () method ,Stack Class, Overloading Constructors, Using Object as Parameter, Argument Passing , Inheritance Basics, Member Access and Inheritance, Using Super Class, Creating a Multilevel Hierarchy , Using Abstract Classes, Using Final with Inheritance ,The object class , Defining a package, Understanding Class path , Importing packages , Defining an Interface, implementing Interfaces , Applying Interfaces, Variable in Interfaces

**UNIT IV: Exception Handling and String Handling**

Exception Handling Fundamentals, Exception Types, Uncaught Exceptions, Using Try and catch ,Java Built in Exceptions, User defined Exceptions Sub classes , The String class, The String constructor, Special String Operations , Characters extraction, String searching and Comparison, Data Conversion using valueof () , The String Buffer Class



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**UNIT V: Exploring JAVA Lang and Input/output- Exploring JAVA I/O**

Simple type wrappers, Runtime Memory Management, Array Copy, Object Clone and Clone-able Interface, Class and Class Loader, Security Manager, The java I/O Classes and Interfaces, File name-filter and Directories, I/O Stream classes: File input string, File Output Stream, Byte Stream, Byte Array Input Stream, Byte Array Output Stream, Filtered Stream, and Buffered Streams: Buffered input stream, Buffered Output stream

**UNIT VI: Networking, The Applet class, Swing and JAVA Database Connectivity (JDBC)**

Socket Overview, Reserved Socket, Proxy Servers , Internet addressing, Domain naming services (DNS) Java and the Net, the Networking Classes and Interfaces , The applet class, applet architecture, An applet Skeleton: Initialization and termination , Overriding Update (), Status windows , Handling Event: The Event class, Processing mouse Events , Handling Keyboard Events , HTML Applet tag, passing parameter to Applets , Applet context and show Document () , The Audio Clip and Applet Stub Interface , Swing and its features, Text fields, Buttons, Toggle Buttons, Check Boxes, Radio Buttons, View ports, Scrolling, Sliders and Lists , Combo Boxes, Progress bars, Tool Tips, Separators and Choosers, Layered Panes, Tabbed Panes, Split Panes and Layouts ,Introduction to JDBC, Type of JDBC Connectivity , Accessing Relational Database from Java Programs , Establishing Database Connections

**Reference Books:**

1. The Complete Reference- Java2 by H. Schildt, Fourth Edition, 2001, Tata McGraw Hill, ISBN -0072130849
2. Java : How to Program Java2 by -Dietel and Dietel, Second Edition, 2001, Pearson Education, ISBN- 0138993947
3. Java Example in Nutshell by D.Flanagan, Third Edition, 2001, 'O' Reilly, ISBN- 0596006209

A Programmers Guide to Java Certification by K.Mughal and R.W.Rasmussen First Edition, 1999 , Pearson Education ISBN- 0201596148

1. Java Foundation Classes by M.T.Nelson, Tata McGraw Hill ISBN: 007913758X
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**M.Sc. CM-302**

**Operations Research**

**(4 Credits)**

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**UNIT I: Basics of Operations Research**

Definition of Operations Research, Characteristics of operations Research, Scientific Methods in operations Research, Necessity of operations Research, Scope of operations Research, Objective of operations Research, Phases of operations Research.

**UNIT II: Linear Programming**

Introduction, Formulation of LP Programming, Graphical solution of LP programming, Development of SIMPLEX Method, Advantages of linear programming method.

**UNIT III: Transportation Models**

Introduction to model, Matrix terminology, Definition of transportation, Formulation and solution of transportation Model.

**UNIT IV: Assignment Models**

Definition of assignment models, Comparison with Transportation Model, Mathematical representation of Assignment model, Formulation and solution of Assignment model.

**UNIT V: Theory of Game**

Introduction, Characteristics of Game Theory, Basics definitions, MaxMin (MinMax) criteria and optimal strategy, Saddle point, Optimal strategies and value of game, Solution of game with saddle point.

**UNIT VI: Project Management by PERT /C PM**

Introduction, Historical development of PERT/CPM Technique, Application of PERT/CPM, Basics steps In PERT/CPM Technique, Network diagram representation, Rules for drawing Network diagram, Project evaluation and review technique, Application areas of PERT/CPM,



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**References Books:**

1. Operation Research, Edition IV, Premkumar Gupta and D. S. Hira, S. Chand and Co. Ltd Publication, 2002, ISBN-81-219-0218-9
  2. Operation Research, Edition IV, , Premkumar Gupta and D. S. Hira, S. Chand and Co. Ltd Publication, 2009, ISBN-81-219-0281-9
  3. Operations Research, 2005-06, S.D. Sharma, Kedar Nath Ram Nath and CO publishers. ISBN: 935059336X
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**M. Sc. CM-303**

**Visual Basic .NET**

**(4 Credits)**

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**UNIT I: Getting Started With VB.Net and Visual Basic: The Language**

The integrated Development Environment, The Start Page. Project types, The IDE Components, Building Console Application. Variables, Constants, Arrays, Flow Control Statements.

**UNIT II: Writing And using procedure and Working with Forms**

Subroutine Function, Arguments passing Mechanisms, Event handler Arguments, Passing an unknown number of Arguments, Overloading function. The Appearance of the Form, Properties of the form, Anchoring & Docking, The Form Events, Loading & Showing forms, Controlling one Form from within another, Forms vs Dialog Boxes Designing Menus, The Menu Editor, The Menu item Object Properties, Manipulating menus Run Times. Iterating a menu Item, Building Dynamic Form at Run Time, Creating Event handler At Run Time

**UNIT III: Basic and More Windows Controls AND Building Custom Class & Windows Control**

The Text Box. Control, Basic Properties, Text manipulation properties, Text selection properties, Text Selection Method, Undoing Edits, Capturing keystrokes, The ListBox, CheckedListBox, & ComboBox Control, Basic properties, The Item Collection, Searching, The Scrollbar & Trackbar Control, The Common Dialog Control, Color Dialog Box, The font Dialog Box. The Open & save As Dialog Box, The Prim Dialog Box, The Rich Text Control, The Rich textbox Properties, Methods, Advanced Edition Feature, Cutting & Pasting, Searching in Rich Textbox, Formatting URL, Print Document, PrintDialog, PageSetupDialog, PrintPreviewDialogControls, printer & Page Properties, ImageListControl, The TreeView Control, Adding new Items at Design Time, Adding New Item at Run time, Assigning images to Node Scanning the Tree View Control, The ListView Control, The Column Collection, The ListItemObjects, The Item Collection, The Sub ItemCollection. Building & using Custom class, Properties in custom class, Inheritance, Polymorphism, MyBase & MyClass Keywords, Building & using CustomControl, designing Irregular Shaped Control, Designing Owner Drawn Menus

**UNIT IV: Handling Strings, Charters, Dates and Working with Files & Folders**

The Char & String Class, The DateTime Class. Directory, File, DirectoryInfo, FileInfo & Path Classes, FileStream, StreamReader, StreamWriter Objects, Sending Data to a File, The File System watcher Components



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**UNIT V: Drawing & Painting with Visual Basic and Error Handling & Debugging, Tilt Multiple Documents Interface**

Displaying lineage, Exchanging Images through the clipboard, Drawing with GDI+, The Basic Drawing Objects, Drawing Shapes, Drawing Methods. Types of Error, Exception & Structured Exception handling, Debugging. MDI Application, Building MDI Application Built In capabilities of MDI Application. Accessing Child Forms.

**UNIT VI: Building Database Application with ADO.NET and Introduction to web Programming**

The architecture of ADO .NET, Creating Dataset, DataGrid Control, Data binding, DataAdapter Object, The Command & DataReader Objects 12.0, The Structure of Dataset, The DataForm Wizard, Transaction. Building web Application, Interacting with web Application, The Web Control, The ASP.NET Objects, The Page Object, The Response Objects, The Request Objects, the Server Objects, Handling Multiple Forms In web Application.

**Reference Books**

1. Mastering Visual Basic.Net By Evangelos Patroutsos (BPB Publication)
2. Visual Basic. Net Programming By Billy Hollis, Rockford Thotlog (Wrox Publication)
3. Visual Basic .Net Programming Black Book By Steven Holzner
4. Beginning VB.Net (2<sup>nd</sup> Edition)



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**M. Sc. CM-304**

**Software Testing Tools**

**(4 Credits)**

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**UNIT I: Introduction to Software Testing**

Quality, Quality Culture, Customer View, Characteristic of Software, SDLC Life cycle, Definition of Software testing, Principles of Software testing, Economics of testing, Testing policy, Structured approach to testing. Testing Process, Test objects, Test Methods, Black Box testing, White box testing, Configuration Management

**UNIT II: Defect Management**

Defect, Software Verification and Validation, Defect Techniques for Finding defect, Static technique, Dynamic technique, Categories of testing, Defect Management Process , Defect Management Risks, Retesting, Defect Life Cycle, Defect Tracking Tools, Severity, Priority, Defect Reporting, Defect Density

**UNIT III: Levels of Testing**

‘V’ Model, Stub, Driver, Integration Testing, Bottom-Up Testing, Top-down testing Sub-System testing , System testing, Execution Testing, Usability Testing , Compatibility testing, Operation testing, Acceptance Testing ,Alpha Testing, Beta Testing. Regression testing Error-handling testing , Manual-Support testing, Smoke testing, Ad-hoc testing, Parallel Testing, Stress testing, Load testing.

**UNIT IV: Writing and Tracking Test Cases**

Test plan, Test plan Benefits, Test Plan Template, Test Scope, Test Objectives, Assumptions, Risk, Risk Analysis , Risk management, Test Schedule and Planned Resources , Test case planning overview, Test Design, Test Cases, Test Procedures, Building Test Data, Equivalence Partitioning, Boundary Value analysis, Test case Organization and Tracking





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**UNIT V: Automated Testing and Test Tools**

Benefits of Automation, Introduction to Winrunner7.01 , Recording and Playback, GUI Map File and GUI map per Test , Creating Checkpoints, Virtual Object wizard, Programmed macros, Recording Tests, Synchronizing Test, checking bitmaps , Creating Data Driven Tests, Reading Text, Creating Batch Tests.

**UNIT VI: Test Director Software and Quick Test Professional**

Server and Client System configuration, Applications of Test Director, Creating Users in the project, Assigning Rights, Writing Test Cases in Test Director, Automation of test cases, Bug reporting, Customization of Fields, Introduction to QTP, Record and Play back, Active Screen , Running and analyzing Tests, Creating Checkpoints , Parameterizing Tests, Creating Output Values, Working with regular Expression, Dividing Tests into Multiple Actions

**Reference Books:-**

1. Software Engineering by Roger S. Pressman, Sixth Edition, McGraw Hill International Pub, ISBN- 0077227808.
2. Software Testing in the Real World by Edward Kit, Addition – Wesley Pub, ISBN-0201877562
3. Software Testing by Ron Patton, Second Edition, BPB Publication, ISBN-9780672327988
4. The Art of Software Testing by G. J. Myers, Third Edition, Wiley-InterScience Pub, ISBN: 9781118031964



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**M. Sc. CM-305 Elective III (1)      Advanced Operating System    (4 Credits)**

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**UNIT I Introduction to UNIX/Linux Kernel**

System Structure, User Perspective, Assumptions about Hardware, Architecture of UNIX Operating System (TextBook-3: Chapter Topics: 1.2, 1.3, 1.5, 2.1), Concepts of Linux Programming-Files and the File system, Processes, Users and Groups, Permissions, Signals, Inter-process Communication (TextBook-1: Chapter 1- relevant topics)

**UNIT II File and Directory I/O**

Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, inodes, structure of regular file, open, read, write, lseek, close, pipes, dup (TextBook- 3: Chapter Topics: 3.1-3.4, 4.1, 4.2, 5.1-5.3, 5.5-5.7, 5.12, 5.13) open, creat, file sharing, atomic operations, dup2, sync, fsync, and fdatsync, fcntl, /dev/fd, stat, fstat, lstat, file types, Set-User-ID and Set-Group-ID, file access permissions, ownership of new files and directories, access function, umask function, chmod and fchmod, sticky bit, chown, fchown, and lchown, file size, file truncation, file systems, link, unlink, remove, and rename functions, symbolic links, symlink and readlink functions, file times, utime, mkdir and rmdir, reading directories, chdir, fchdir, and getcwd, device special files (TextBook-4: Chapter Topics: 3.3, 3.4, 3.10 3.14, 3.16, 4.2-4.23)

**UNIT III: Process Environment, Process Control and Process Relationships**

Process states and transitions, layout of system memory, the context of a process, saving the context of a process, sleep, process creation, signals, process termination, awaiting process termination, invoking other programs, the user id of a process, changing the size of the process, The Shell, Process Scheduling (TextBook-3: Chapter Topics: 6.1-6.4, 6.6, 7.1-7.8, 8.1)

**UNIT IV: Memory Management**

The Process Address Space, Allocating Dynamic Memory, Managing Data Segment, Anonymous Memory Mappings, Advanced Memory Allocation, Debugging Memory Allocations, Stack-Based Allocations, Choosing a Memory Allocation Mechanism, Manipulating Memory, Locking Memory, Opportunistic Allocation (TextBook-1: Chapter 8) Swapping, Demand Paging (TextBook-3: Chapter Topics: 9.1, 9.2)

**UNIT V. Signal Handling**

Signal concepts, signal function, unreliable signals, interrupted system calls, reentrant functions, SIGCLD semantics, reliable-signal technology, kill and raise, alarm and pause, signal sets, sigprocmask, sigpending, sigsetjmp and siglongjmp, sigsuspend, abort, system function revisited, sleep (TextBook-4: Topics: 10.2-10.13, 10.15-10.19)

**Unit VI: Windows Thread Management**



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Thread Internals Data Structures, Kernel Variables, Performance Counters, Relevant Functions, Birth of a Thread Examining Thread Activity: Limitations on Protected Process Threads, Worker Factories (Thread Pools) Thread Scheduling Overview of Windows Scheduling, Priority Levels, (TextBook-2: Chapter 5 [relevant topics])

**References:**

1. Linux System Programming, O'Reilly, by Robert Love.
2. Windows Internals, Microsoft Press, by Mark E. Russinovich and David A. Soloman.
3. The Design of the UNIX Operating System, PHI, by Maurice J. Bach.
4. Advanced Programming in the UNIX Environment, Addison-Wesley, by Richard Steve



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**M. Sc. CM-305 Elective III (2)**

**JavaScript**

**(4 Credits)**

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**UNIT I: Introduction to JavaScript**

First look at JavaScript, Adding JavaScript to XHTML Documents, History & Use of JavaScript, JavaScript's Primitives Types – Numbers, Strings, Booleans, Undefined and Null, Composites Types – Objects, Arrays, Functions and The typeof Operator, Variables – Identifiers, Variable Declaration

**UNIT II: Operators & Statements**

Operators – Assignment, Arithmetic, Bitwise, Bitwise Shift, Comparison, Logical, typeof, void, Increment, Decrement and ?: Operator, Core JavaScript Statements – if Statements, switch Statement, while loop, do-while loop, for loop, continue and break Statement

**UNIT III: Functions and Objects**

Function Basics –Parameter-Passing Basics, return Statement and Parameter Passing: In and Out, Recursive Functions, Objects in JavaScript, Object Fundamentals – Object Creation, Object Destruction, Properties, Objects Are Reference Types and Passing Objects to Functions

**UNIT IV: Array, Date, Math's & Type Related Objects**

Array – Accessing Array Elements, Adding, Changing and Removing Array Elements, Array as Stacks and Queues and Manipulating Arrays, Date – Creating Dates and Manipulating Dates, Math – Constants and Methods Provided by the Math Object, Type Related Objects – Number and String

**UNIT V: Regular Expression**

The Need for Regular Expressions, The Concept of Regular Expressions, Introduction to JavaScript Regular Expressions – Creating Patterns, RegExp Object – test, compile and exec, String Methods for Regular Expressions – search, split, replace and match

**UNIT VI: Form Handling**

The Need for JavaScript Form Checking, Form Basics – Accessing Forms and Accessing Form Fields, Form Fields – Common Input Element Properties, Buttons, Text Fields, Checkboxes, Radio Buttons, Hidden Fields, File Upload Fields, Select Menus, Label,Fieldset and Legend, Form Validation – Abstracting Form Validation and Drop-in Form Validation

**REFERENCE BOOKS –**

1. The Complete Reference, JavaScript – By Thomas Powell, Fritz Schneider, TATA McGRAW-HILL Edition, 2004, ISBN – 0-07-0590027-3
2. Pure JavaScript – By R. Allen Wyke Jason D. Gilliam, Charlton Ting, Sean Michaels, SAMS Publishing, 2001, ISBN – 0-672-32141-6



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**M.Sc. CM-305 Elective III (3)**

**PHP & My SQL**

**(4 Credits)**

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**UNIT I: Introduction to PHP**

Basic Syntax, Sending Data to the Web Browser, Understanding PHP and HTML and White Space, Writing Comments, What Are Variables? , About Numbers, About Strings, About Constants, Operators, What Are Arrays, Conditionals statements, looping statements.

**UNIT II: Creating Dynamic Web Sites**

Creating an HTML Form, Handling an HTML Form, Validating Form Data, Handling HTML Forms with PHP Redux, Making Sticky Forms, Including Multiple File, Creating and Calling Your Own Functions, Variable Scope, Date and Time Functions, Sending Email

**UNIT III: Introduction and Advanced SQL and MySQL**

Choosing Your Column Types, Choosing Other Column Properties, Creating Databases and Tables, Inserting Records, Selecting Data, Using Conditionals, Using LIKE and NOT LIKE, Sorting Query Results, Limiting Query Results, Updating Data, Deleting Data, Using Functions, Database Design, Performing Joins, Grouping ,Creating Indexes, Using Different Table Types, Performing FULLTEXT Searches, Database Optimization

**UNIT IV: Error Handling and Debugging**

General Error Types and Debugging, Displaying PHP Errors, Adjusting Error Reporting in PHP, Creating Custom Error Handlers, Logging PHP Errors, Debugging Techniques, SQL and MySQL Debugging Techniques

**UNIT V: Using PHP with MySQL**

Modifying the Template, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Ensuring Secure SQL, Counting Returned Records, Updating Records with PHP

**UNIT VI: Web Application Security**

Using Cookies, Using Sessions, Sessions and Cookies, Improving Session Security, More Secure Form Validation, Handling HTML, Validating Data by Type, Form Validation with JavaScript



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**References**

1. PHP and MySQL for Dynamic Web Sites: Visual Quickpro Guide, Second Edition, Larry Edward Ullman, Peachpit Press, 2003, ISBN 0321186486, 9780321186485.
2. Programming PHP, II Edition, "Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre", "O'Reilly Media, Inc.", 2013, ISBN 1449365833, 9781449365837



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**M. Sc. CM-401      Linux Operating System and Administration      (4-Credits)**

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**UNIT I: Introduction to Fedora**

Features of Fedora, Hardware Requirements, Fedora Installation, Working with Linux file system, Logging to & working with Linux, Changing User Information, Reading Documentation, Using the shell, Using the text editors, Working with File Permissions

**UNIT II: The X Window System**

Basic X concept, Using XFree86, Starting X, Selecting & using X window manager

**UNIT III: Managing Users & Services**

User Accounts, Managing users, Managing Groups, Managing passwords, Granting System administrative privileges to regular users, User login process, Fedora core Linux Boot Process, System services and run levels, Controlling services at boot with administrative tools, Starting and stopping services manually

**UNIT IV: Managing Software & System Resources**

Using RPM for software management, controlling software from source, System monitoring tools

**UNIT V: Backing up, Restoring & recovery**

Choosing Backup strategy, Choosing backup hardware & media, Using Backup software, Copying files

**UNIT VI: Printing and Network Connectivity with Linux**

Configuring & managing print services, Creating & configuring Local printers, Creating Network printers, Using network configuration tools, Using DHCP [Dynamic Host Configuration Protocol], Using the network file system, Putting SAMBA to work, Introduction to DNS & Apache web server

**Reference Books:-**

1. Red Hat Linux 7 Unleashed by Bill Ball, David Pitts. Publisher: Sams 2000. ISBN-13: 9780672319853
2. Fedora Unleashed by Bill Ball ISBN: 8129705087



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**M. Sc. CM-402      Web Page Design and Active Server Pages 3.0      (4 –Credits)**

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**UNIT I: Web Publishing and HTML Documents**

Basic HTML Concepts, HTML: Structured Language, Overview of HTML, web Browser, WWW, Web Server, The Phases of Web Site Development-Implementation, Maintenance, Testing, What are Links or URLs? Structure of HTML Documents-HTML, Head, Title, Body tags, The Mark up tags Heading Styles, Formatting Text, List styles, Line Breaks, Paragraphs, Div, Including images in the Documents, Introduction to Hyper linking, The Anchor tag, Anchor tags and Images, Formatting table, Table, Table rows, Table data tags, Table Header and Footer tags, Frames The Form tag, Action and Method Attributes, Controls: Text fields, checkboxes, Option Buttons, Submit Buttons, Listboxes, Password Fields.

**UNIT II: Getting Started with ASP and Client side scripting and Server side scripting**

What is Dynamic Web Page?, Using dynamic web page, Installing and Configuring IIS 5.0 The Microsoft Management Console(MMC), Testing Web Server, Virtual Directories, How do Web Server Works, Client Side Scripting, Writing Client Side Scripts, A Client Side Script using VB script, A Client Side Script using Javascript, Advantage & Disadvantage of Client Side scripting, Server Side script-Writing Server Side Scripts.

**UNIT III: Basic ASP Technique, Variables, ASP control Structure and Object, Properties, Methods and Events**

Getting Information from the User, Using the Information Obtained from the User, A Simple Example. Creating Variables, Data Types in VB Script, Declaring Variable, Option Explicit arithmetic & Comparison Operator, Constant & String Manipulation, Arrays. Branching Structure-If.....Then, Select Case, Looping structure-For.....Next, For Each Next, Do.....While, Do loop while, Jumping Statement- Procedures, Functions. Object Terms- Programming with Object, Object Model Structure.

**UNIT IV: The Request & Response Objects and Application, Session and Cookies**

Sending Information to the Server, Sending Information Back to the Client Write Method The Request Object Collection: Query Strings, Forms, Server Variable, Client Certificate The Response object -1. Controlling information 2. Content expiration 3. Redirection Server. Execute & Server. Transfer. Using Cookies- Making & Deleting Cookies, The Application object, Application variable, Application object collection, Application object method, Global.asa, The Session Object, Session Object collection, Session Object, Properties, Session Object Method, Session & Global.asa.

**UNIT V: Error Handling and Server Pages Components**

Types of Error, Debugging ASP Script, Client Side verses Server Side Debugging, Get Last Error method, The Server Object, The Add Rotator Component, The Content linking Component, The Browser capabilities Component.





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**UNIT VI: ASP & Data Store Access And Using Recordsets**

Universal Data Access, ODBC, OLE- DB , ADO. Getting data, Microsoft Access(.mdb) files, Microsoft SQL Server/ MSDE(.mdf) files, What is connection? connection String Data Link file, Data Source Names, Connection Object, Opening a Connection, Closing a connection, The Recordset object, Creating a Recordset using Explicit connection object ADO Constants, Active Connection, Cursor Type, ADO Cursor Type, Locking, Using Recordset Object, BOF and EOF properties, Moving through Records, Finding Records, Filtering

**Reference Book's**

1. Beginning ASP 3.0 by David Buser, John Kauffman, wrox publication ISBN: 978-0-7645-4363-0
2. Mastering Active Server pages 3 By Russell Jones (BPB publication) ISBN-10: 0782126197
3. Complete Reference – HTML – Powell ISBN-10: 0071496297



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**M. Sc. CM-403**

**Network Management**

**(4-Credits)**

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**UNIT I: Introduction to Networks & LAN Hardware**

Uses of Computer Networks., Network Hardware- LAN,MAN,WAN, Wireless Networks, Network Software - Protocol Hierarchy, Design and issues for layer, Network Interface Card, Drivers, Magnetic Media, Twisted Pair Cable, Coaxial Cable, Fiber Optic Cable, Network Topologies-Bus Ring, Star, Tree and other Topologies, Networking Devices-Repeaters, Bridges, Routers, Gateways, Hub and Switch

**UNIT II: LAN Software**

Client-Server Model, File Server, Database Server, Print Server, DHCP Server, DNS Server, Peer-TO-Peer Networks

**UNIT III: Multiplexing and Switching**

Concept of modulation and their application, Multiplexing-Time division and Frequency division, Switching, Circuit Switching, Packet Switching, Message Switching

**UNIT IV: Network Standards and Network Protocols**

OSI Reference Model, TCP/IP reference model, IP Protocol , SMTP, PPP, FTP ,HTTP, SNMP, IP addresses

**UNIT V: Introduction to ISDN, PBX, FDDI and Internet**

ISDN Architecture, USE of PBX, FDDI, Token ring architecture, Definition, Internet Verses Intranet, Internet Service Providers, E-mail- Architecture and Services, WWW- Client side and Server Side, URL, Messengers, Search Engine

**UNIT VI: Ethernet Technology (802.3)**

Overview of Ethernet, 10 Mbps IEEE Standards, 100 Mbps IEEE Standards, Windows 2003 Server Overview, Understanding and using Active Directory managing and creating User Accounts, Creating and managing Shared Folders – Managing permissions

**Reference Books:-**

1. Local Area Network - Gerd E. Keiser Tata McGraw Hill ISBN: 0072393432
2. Local Area Network - Peter Holdson BPB Publication Fifth Edition ISBN: 0826454097
3. Data and Computer Communication -William Stallings Fifth Edition ISBN: 9332518866
4. Windows 2003 Server - Mark Minasi ISBN: 0782141307



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**M. Sc. CM-404                      Software Project Management                      (4 - Credits)**

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**UNIT I: Introduction to Software Project and Project Management**

Project, Software Project v/s other types of Project, Activities covered by Software Project, Management, The Project as a System, Problem with Software, Project Stakeholders. Introduction to Project Management, Phases of Project Management, Project Management life cycle.

**UNIT II: Resources Planning and Estimation Technique and Project Planning**

Resource Introduction, Resource Planning Delphi Techniques, COCOMO Model, FunctionPoint Analysis, Basic concept, Project Scheduling defining a task set for the Software Project, Defining a task network, Scheduling.

**UNIT III: Change Management**

Software Configuration Management, Software Configuration Management Repository, Software Configuration Management Process.

**UNIT IV: Reengineering**

Business process reengineering, Software reengineering, Reverse engineering, Forward engineering.

**UNIT V: Small Projects**

Introduction, Some problem with student projects, Content of project plan.

**UNIT VI: ISO / 2207 an overview**

The ISO /2207 approach to software life cycle data, The ISO /2207 approach to software life processes, The acquisition process, The supply process.

**Reference Books**

1. Software Engineering. - BY Pressman- Sixth Edition ISBN-10: 0077227808
2. Software Engineering - BY Richard Fairly ISBN-10: 0074631217



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**M.Sc.CM-405 Elective IV (1)**

**ORACLE DBA**

**(4 Credits)**

### **UNIT I: Database Architecture**

Overview of database, pfile, spfile, Instance, Tablespaces, Datafiles, Other files, Oracle managed Files, Users, Schemas, Indexes, View, Sequences, Synonyms, Privileges, Roles, Clusters, Hash Clusters, Internal memory structure, SGA, PGA ,Background processes, External structure, Redo logs, Control files, Trace files, Alert logs, Creating database manually

### **UNIT II: Hardware configuration and consideration**

Architectural overview, Standalone hosts, Standalone hosts with disk array, Standalone, Hosts with disk shadowing, Multiple databases, Networked hosts, Networks of databases, Remote updates, Remote application options, Real application, Clusters, Multiple processors, The parallel query and parallel load options, Client/server databases application, Standby databases

### **UNIT III: Physical databases layouts**

Database file layouts, I/O connections among data files, I/O bottlenecks among all data files, Concurrent I/O among background processes, Defining recoverability and performance goals for the system, Defining the system hardware and mirroring architecture, Database space using overview, Implementation of the storage clause, Locally managed Tablespaces, Dictionary managed Tablespaces, Table segments, Index segments, Rollback segments, Temporary, Free space, Resizing Datafiles, Control files, Online redo log Files Deallocate space from segments, Shrinking Datafiles, Shrinking Tables, Clusters and indexes, Oracle managed files(OFA)

### **UNIT IV: Logical Database Layouts**

Describe logical structure of a database, Different types of Tablespaces, Changing the Tablespaces size, Allocating segments for temporary segments, Temporary segments in permanent Tablespaces, Changing tablespace status, changing tablespace storage settings, Oracle Managed Files (OMFs), Oracle Flexible Architecture(OFA), Different segments types and relationships, Extent usages, Block space utilization

### **UNIT V. Backup –Recovery& Networked ORACLE**

Types of Logical and Physical backups, Implementations , Integrations of backup procedures, NOARCHIVELOG Mode, ARCHIVELOG Mode, Backup Methods –Closed Database Backup, Open Database Backup, Recovery in NOARCHIVELOG Mode, Recovery in ARCHIVELOG Mode, Recovery manager architecture, Recovery Manager Features, Using Recovery manager & RMAN, Using OEM backup manager, Generating lists and reports. **Networked Oracle** - Overview of SQL \*Net and Net8 , Connect descriptors, Service names and Listeners, Net8 assistants, The multi-protocol



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interchange, Dedicated Server Processes, Oracle Shared Server, Benefits of Oracle Shared Server, Client Server application, Database links

**UNIT VI: .Database Security, Auditing& Database Tuning**

Security capabilities-Account security, Object privileges, System level roles and privileges, Implementing security-operating system security, Create user, Drop user, User profiles, and Password managements, Preventing password reuse, setting password complexity, Using password file for authentication, Auditing, Login audits, Action audits, Object audits, Protecting the audit trail. **Tuning Databases** -Tuning application design, Tuning SQL,Memory usage, Data storage, Data manipulation,Physical storage, Logical storage,Reducing net traffic using OEM

**Reference Books –**

1. Oracle 9i DBA Handbook,Eighth Reprint - Kevin Lonely, Marlene TheriaultOracle Press, Tata McGraw Hill PublicationISBN-0- 07-048674-3
2. OCA Oracle 9i Associate DBA Certification Exam Guide,Sixth Reprint, Jason Couchman, Sudheer N. MarishettiOracle Press,Tata McGraw Hill Publication,2005 ISBN-0-07-049893-8



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### **M.Sc.CM-405 Elective IV (2)      Distributed Database Concepts      (4-Credits)**

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#### **UNIT I: Database System Architectures**

Centralized Architectures, client server Architecture, Server System Architecture , Parallel System Distributed System , Network Types

#### **UNIT II: Distributed Database**

Homogeneous and Heterogeneous Databases , Distributed Database storage, Transaction Concept ,Distributed Transactions, Commit Protocols, Concurrency control in distributed databases, Availability, Serializability, Distributed Query Processing , Heterogeneous Distributed Databases , Distributed Database in Oracle

#### **UNIT III: Parallel Database**

Introduction, I/O Parallism, Interquery Parallism, Intraquery Parallism, Interoperation Parallism, Intraoperation Parallism, Design of Parallel system,

#### **UNIT IV: Decision Support System & Indexing and Hashing**

Introduction, Aspects of decision support, Database design for Decision support, Data Preparation Data warehouses and Data marts, Online Transaction Processing (OLTP), Basic Concepts, Ordered indices, B tree index files, B+ tree index files, Multiple key access, Static Hashing, Dynamic Hashing, Comparison of Ordered indexing and Hashing, Bitmap indices

#### **UNIT V: Advanced Data types and New Applications & Advanced Transaction Processing**

Motivation, Time in Database, Spatial and Geographic data, Multimedia Databases, Mobility and Personal Databases. Transaction Processing Monitors, Transactional Workflows, Main memory databases, Real time transaction system, Long duration transactions, Transaction Management in Multidatabases

#### **UNIT VI: Recovery System**

Failure classification, Storage structure, Recovery and Atomicity, Log based recovery, Shadow Paging, Recovery With concurrent Transactions, Failure with loss of Non-volatile storage, Advanced recovery technique, Remote backup system

#### **Reference Books –**

1. Database System Concepts - (Abraham, Korth and Sudarshan (4th edition) Tata McGraw-Hill) ISBN: 007044756X
2. An Introduction to Database systems - C. J. Date (3rd Edition) Pearson Education



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**M.Sc.CM-405 Elective IV (3)**

**Data Mining**

**(4-Credits)**

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**UNIT I: Introduction**

Basic Data Mining Tasks, Data Mining Versus Knowledge Discovery in Databases, Data Mining Issues, Data Mining Metrics

**UNIT II: Related Concepts**

Database/OLTP Systems, Fuzzy sets & Fuzzy Logic, Information Retrieval, Data Ware housing

**UNIT III: Data Mining Techniques**

Introduction, A Statistical Perspective on Data Mining

**UNIT IV: Classification**

Introduction, Statistical-Based Algorithms, Distance –Based Algorithms

**UNIT V: Clustering**

Introduction, Similarity and Distance Measures, Outliers, Hierarchical Algorithms, Partition Algorithms, Minimum Spanning Tree, Squared Error Clustering Algorithm, K-Means clustering, Clustering Large Database

**UNIT VI: Web mining**

Introduction, Web Content Mining, Web Structure Mining, Web Usage Mining

**Reference Books**

1. Data Mining Introductory and Advanced Topics, 2008, Margaret H.
2. Dunham and S. Sridhar, Pearson Education, ISBN 81-7758-785-4



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**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc.CM-408 Open Elective I**

**Language Aptitude**

**(1 Credits)**

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**UNIT I: Professional Skills**

Interview Techniques, HR Interview Questions, Getting Prepared for the interview, Telephonic Interview

**UNIT II: Group Discussion**

Meaning, nature and purpose, Do's & Don'ts of Group Discussion, Topics of the GD, Practical Sessions on GD

**UNIT III: Personality Development**

Interpersonal Skills, Empathy Skills, Negotiation Skills, Problem Solving, Leadership Skills

**UNIT IV: Basics of English**

Tense: mood, aspect, usage, Prepositions, Basic Sentence Structure, Framing Questions, Model Auxiliary Verbs & usage, Synonyms & Antonyms, Idioms & Phrases

**UNIT V: Writing Skills**

Resume Building, Curriculum Vita, Email Drafting; Do's & Don'ts, Essay Writing, Covering Letter

**UNIT VI: Presentation Skills and English Aptitude**

Body language, eye contact, facial expressions, Opening of Presentation, Public Speaking: Do's & Don'ts, Topics for the presentation, Seminars: Practical Sessions, **English Aptitude**: Spotting Errors, Closet Test, Sentence Correction, Ordering of Sentences, Comprehension, Sentence Formation, Sentence Improvement

**References:**

1. English Grammar & Composition, First Edition, Rajendra Pal & Prem
2. Lata Suri, Sutan Chand & Sons Delhi, 2012, ISBN:978- 81-8050-868-0
3. Personality Development & Communicative English, Fifth Edition, Dr. T. Bharathi, Neelkamal Publication Private Limited, 2004, ISBN: 81-8316-007-7
4. R. Gupta's Group Discussion & Interviews, First Edition, Anand Ganguly, Ramesh Publication House Delhi, ISBN:81-7812-050-X.





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5. Practical English Grammar, Fourth Edition, A.J.Thomson & A.V. Martinet, Oxford India, 1986 , ISBN-13:978-0-19-562053-5.
6. Developing Communication Skill, First Edition, Krishana Mohan & Meera Banerji, Macnillan India, 1990, ISBN-0333929195.
7. Essential English Grammar, Second Edition, Raymond Murphy Cambridgege University Press, 1998, ISBN- 13:978-81-7596-029-9.



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**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc.CM-408 Open Elective II Logical Reasoning and Quantitative Aptitude**

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**(1 Credits)**

**UNIT I: General Mental Ability-I**

Series Completion, Coding and Decoding, Blood relations, Seating Arrangement, Comparison type questions.

**UNIT II: General Mental Ability-II**

Directions sense test, logical venn diagrams, Inserting the missing character, data sufficiency.

**UNIT III: Logical Deduction**

Logic, statement arguments, statement assumptions, statement conclusion.

**UNIT IV: Arithmetical Ability-I**

Numbers, Simplification, Average, Problems on ages, Percentage, Probability.

**UNIT V: Arithmetical Ability-II**

Profit and loss, ratio and proportion, time and work, simple interest compound interest, calendar.

**UNIT VI: Data Interpretation**

**Tabulation, Bar graphs, Pie charts, line graphs**

**Reference books:**

1. Quantitative Aptitude by Dr. R S Aggarwal, Revised edition, ISBN 81-219-2498-7
2. A Modern Approach to Verbal Reasoning by Dr. R S Aggarwal, S. Chand and Company pvt. Ltd., ISBN 81-219-0552-4



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M.Sc. (Computer Management) Second Year (Two Semester)

### **M.Sc.CM-408 Open Elective III: DBMS Administration (1 Credits)**

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#### **UNIT I: Client/Server Concepts**

Client server Architecture, Invoking Client Programs, MySQL Client Program-Using MySQL interactively, Statement Terminators, Using Script Files with MySQL, MySQL Output Formats, Client Commands and SQL Statements, Using Server-Side Help, Using the – safeupdates Option,

#### **UNIT II: MySQL Architecture**

Client/Server Overview, Communication Protocols, the SQL Parser and Storage Engine Tiers, How MySQL Uses Disk Space, How MySQL Uses Memory, Types of MySQL Distributions, Starting and Stopping MySQL Server on Windows, Starting and Stopping MySQL Server on UNIX, Runtime MySQL Configuration, Log and Status Files, Loading Time Zone Tables, Security-Related Configuration, Setting the Default SQL mode , Upgrading MySQL

#### **UNIT III: Locking**

Locking Concepts, Explicit Table Locking, Advisory Locking

#### **UNIT IV: Storage Engines**

MySQL Storage Engines, The MyISAM Engine, The MERGE Engine, The InnoDB Engine, The MEMORY Engine, The FEDERATED Engine, The Cluster Storage Engine, Other Storage engines,

#### **UNIT V: Data (Table) Maintenance**

Types of Table Maintenance Operations, SQL Statements for Table Maintenance, Client and Utility Programs for Table Maintenance, Repairing, InnoDB Tables, Enabling MyISAM Auto-Repair

#### **UNIT VI: Data Backup and Recovery Methods**

Introduction, Binary Versus Textual Backups, Making Binary Backups, Making Text Backups, Backing Up Log and Status Files, Replication as an, Aid to Backup, MySQL Cluster as Disaster Prevention, Data Recovery



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**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc.CM-408 Open Elective IV: Cyber Crime & Cyber Security (1 Credits)**

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Why Learn About Cyber Crime.

Introduction to Cyber Crime.

Types of Cyber Crime.

Hacking passwords of MS-Office Files & Email for ethical use.

Sending Fake Emails/SMS.

Email Tracing.

Chatting In LAN/ Transferring Files in LAN. Sharing Desktop.

Preventing Credit/Debit card Fraud.

Screen Recording.

Introduction to Cyber Security.

Online Safety Tips.

Protecting Password.

Stenography/Hiding Information.

Encrypting Decrypting Information.

Identifying secure websites.

Cyber Laws.



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**M.Sc. (Computer Management) Second Year (Two Semester)**

**M.Sc.CM-408 Open Elective V: Internet Programming (1 Credits)**

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**UNIT I: BASIC NETWORK AND WEB CONCEPTS**

Internet standards - TCP and UDP protocols - URLs - MIME - CGI - Introduction to SGML.

**UNIT II: JAVA PROGRAMMING**

Java basics - I/O streaming - files - Looking up Internet Address - Socket programming - client/server programs - E-mail client - SMTP - POP3 programs - web page retrieval - protocol handlers - content handlers - applets - image handling - Remote Method Invocation.

**UNIT III: SCRIPTING LANGUAGES**

HTML - forms - frames - tables - web page design - JavaScript introduction - control structures - functions - arrays - objects - simple web applications.

**UNIT IV: DYNAMIC HTML**

Dynamic HTML - introduction - cascading style sheets - object model and collections - event model - filters and transition - data binding - data control - ActiveX control - handling of multimedia data

**UNIT V: SERVER SIDE PROGRAMMING**

Servlets - deployment of simple servlets - web server (Java web server / Tomcat / Web logic) - HTTP GET and POST requests - session tracking - cookies - JDBC - simple web applications - multi-tier applications.

**REFERENCES**

1. Deitel, Deitel and Nieto, "Internet and World Wide Web - How to program", Pearson Education Publishers, 2000.
2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002
3. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
4. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.

Naughton, "The Complete Reference - Java2", Tata McGraw-Hill,