Syllabus

of

Master of Science

(Computer Science)

(Two Years Post Graduate Course)

M.Sc. (Computer Science) - I
SEMESTER - I
PAPER-1: DISCRETE MATHEMATICAL STRUCTURE
(1MSc1)

Unit-I :(Fundamental and Mathematics Logic)
Fundamental: Sets and Subsets, Operations on Sets, Sequence, Properties of Integer, Matrices. **Logic**-Proposition and Logical Operation Conditional Statements, Methods of Proof, Mathematical Induction,
Mathematics Logic: Statements and Notation, Connectives ,Normal forms ,The Theory of Interface for The Statement Calculus ,Inference Theory of The Predicate Calculus,

Unit-II :(Counting, Relation and Diagraph, Function)
Counting: Permutation, Combination, Pigeonhole Principle, and Recurrence Relations. **Relational and Digraphs:** Product Sets and Partitions, Relations and Digraphs, Paths in Relations and Digraphs Properties of Relations, Equivalence Relations, Computer Representation of Relations and Digraph, Manipulation of Relations, Transitive Closure. **Functions:** Definition and Introduction, Function for Computer Science, Permutation Functions,

Unit-III :(Graph Theory, Boolean and Tree)
Graph Theory: Basic Concept of Graph Theory, Euler Paths and Circuits, Hamiltonian Paths and Circuits. Other Relations and Structure- Partially ordered Sets, Lattices Finite.
Boolean: Algebra, Functions of Boolean Algebras, Boolean Function as Boolean Polynomials.
Tree- Introduction Undirected Tree, Minimal Spanning Trees.

Unit-IV: (Semigroup and Groups)
Semigroups and Groups: Binary Operations Revisited Semigroups, Products and Quotations of Groups. Introduction to Computability**,** Languages Finite State Machines, Semigroup, Machines and Language.

Books:

1) S. Lipschutz,"Discreate Mathmatics", TMH, ISBN 0-07-066932-0
2) Bernard Kolman C,Busby and Sharon Ross, "Discrete Mathematical Structures", 2007, ISBN - 81-203-2082-4, Publication PHI.
3) Discrete Mathematical Structures with Application to Computer Science, TMH, 2003, ISBN-0-07-065142-6.
4) J.K.Sharma, "Discrete Mathematics", Mcmillan,2009, ISBN-403-924759

References:

1) Goodaire, "Discrete Mathematics with Graph Theory", PHI, ISBN-13-9750131679955.
2) J.K.Sharma, "Discrete Mathematics", McMillan, ISBN-9781403924759.
3) Rajendra Akerkar, "Discrete Mathematics", Pearson, ISBN-9788131717943.
4) Choudham, "a First Course in Graph Theory", Macmillan, ISBN-9780333920404.
5) C. J. Liu "Combinational Mathematics", TMH, ISBN-021726343.

M.Sc. (Computer Science) - I
SEMESTER - I
PAPER-2: ADVANCED JAVA
(1MSc2)

Unit-I: (Introduction of Java with OOPs Concepts)

Introduction of Java: Java and Internet, Features of Java, Oops Concepts of Java, Data Types, Operators, Variables and Arrays **Classes:** Declaring Objects, Methods, Constructor, Overloading Constructor, Garbage Collection, Finalize() Method, Uses of Static and Final Variable, Command Line Argument, Uses of Packages.

Exception Handling: Uncaught Exception, Try -Catch Block, Multiple Catch, Nested Try, Throw, Throws, Finally, Built-in and User- Defined Exception.

Multithreading: Life Cycle, Thread Class and Runnable Interface, Type Priorities, Synchronization and Interthread Communication

Unit-II: (Classes and Package)

Classes: Wrapper Classes, **Applet:** Applet Class, Architecture, Life Cycle, Display Methods, HTML Applet Tag, And Passing Parameter to Applet. **AWT:** Working with Windows, Controls, Layout Manager, and Menus. Introduction of Swings and Event Handling. **Networking:** The Java.Net Package, Connection oriented Transmission, Stream Socket Class, Creating a Socket to a Remote Host on a Port (Creating TCP Client and Server)

Unit-III: (JDBC ODBC)

Database Programming: Design of JDBC, JDBC Configuration, Types of Drivers, Executing SQL Statements, Query Execution, Scrollable and Updatable Result Sets, Rowset,Metadata, Transactions

Collections: Introduction to The Collection Framework (Interfaces, Implementation and Algorithms), Interfaces, **Collection Classes:** Set, List, Queue and Map, **Set:** Hash set, Tree set, and Linked hash Set, Interfaces Such As Lists, Set, Vectors, Linked list, Comparator, Iterator, Hash, Tables.

Unit-IV: (JSP and Servlet)

Servlet: Introduction to Servlet(Http Servlet),Life Cycle of Servlet, Handing Get and Post Request(Http),Data Handling Using Servlet, Creating and Cookies, Session Tracking Using Http Servlet, **JSP**: Getting Familiar with JSP Server, First JSP, Adding Dynamic Contents Via Expressions Scriptlets, Mixing Scriptlets and HTML, Directives, Declaration, Tags and Session.

Books:

1) Diel, “Java How to Program”, Pearson Education Inc, 6th Ed., 2007, ISBN 81-317-0954-X
2) Herbert Schield, “Java2 Complete References”, TMH, 7th Ed., 2007, ISBN 0-07-063677-X
3) Steven Horlzner ,“Java 2 Programming Black Books”, ISBN-13: 978-1588800978

References:

1) Jason Hunter, William Crawford, “Java Servlet Programming”, O'reilly Media Inc., 2th Edition, ISBN- 0596000405

M.Sc. (Computer Science) - I
SEMESTER - I
PAPER-3: DIGITAL ELECTRONICS AND EMBEDED SYSTEM
(1MSc3)

UNIT -I: Introduction

Fundamental Concepts - Introduction, Digital Signal, Analog Signal, Basic Digital Circuits, AND, OR, NOT, NAND, NOR, Exclusive OR, Exclusive NOR Operation, Boolean Algebra, De-Morgan's and Duality Theorems, Timing Diagram.

Number System and Codes – Introduction Number System, Binary Number System, Signed Binary Numbers, Binary Arithmetic's, 1's Compliment, 2's Compliment.

UNIT -II: Combinational Logic & Flip-Flops

Combinational Logic Design - Introduction, Standard Representation for Logic Functions, K-Map Representation, Simplification of Logical Function Using K-Map, Minimization of Logical Function Don't Care Condition, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Multiplexer and their Use in Combinational Logic Design, De-Multiplexer and their use in Combinational Logic Design, Digital Comparators.

Flip- Flops - Introduction, Clocked R-S Flip Flop, J–K Flip Flop, D-Type Flip Flop, T-Type Flip Flop, Master – Slave Flip – Flop, and Edge Triggered Flip Flop, Applications of Flip Flops. Shift Registers and Counters, Ripple Counters, Synchronous Counters, Decoder and Encoder.

UNIT -III: Introduction to Embedded Systems

Introduction to Embedded Systems: Embedded Systems, Embedded Processor & Software into a System, Embedded Hardware Units and Devices in a System, Examples of Embedded Systems, Embedded System-on-Chip (Soc) and Use of VLSI Circuit Design Technology, Complex Systems Design Process and Processors in Embedded System, Formalization of System Design, Design Process and Design Examples, Classification of Embedded Systems, Skills Required for an Embedded System Designer 8051 and Advanced Processor Architectures, Memory Organization and Realworld Interfacing.

UNIT -IV: Real Time Operating Systems

Real Time Operating Systems : OS Services, Process Management, Timer Functions, Event Functions, Memory Management, File and I/O Subsystems Management, Interrupt Routines in RTOS Environment and Handling of Interrupt Source Calls, Real-Time Operating Systems, Basic Design using an RTOS, RTOS Task Scheduling Models, Interrupt Latency and Response of the tasks as Performance Metrics, OS Security Issues.

Books :

1) A. P. Malvino, Jerald A. Brown, "Digital Computer Electronics", TMH, 3rd Ed., 1995, ISBN--13:978-0-07-462235-3
2) R.P. Jain, "Modern Digital Electronics", TMH, 3rd Ed., 2003, ISBN- 0-07-049492-4
3) V. K. Puri, "Digital Electronics: Circuits and Systems", TMH, 13th Reprint, 2006, ISBN-0-07-463317-1

Reference :

1) Frank Vahid, Tony Givargis, "Embedded System Design: A Unified Hardware/Software Introduction", 3rd Ed., John Wiley & sons,2009, ISBN- : 978-81-265-0837-2
2) Alan C. Shaw, "Real-Time Systems and Software", John Wiley & sons, Inc. Pub., 2001, ISBN- : 0-471-35490-2

M.Sc. (Computer Science) - I
SEMESTER - I
PAPER-4: DATA WAREHOUSING AND SQL SERVER
(1MSc4)

Unit I: (Data Warehousing and OLAP)

Introduction to Data Warehousing: Characteristics of a Data Warehouse, Data Warehouse Architectural Strategies, Design Considerations, Data Content, Building a Data Warehouse, Metadata, Tools for Data Warehousing, Performance Considerations, Crucial Decisions in Designing a Data Warehouse, Different Case Studies. Various Technological Considerations: OLTP and OLAP Systems, Data Modeling, Categories of OLAP Tools, Managed Query Environment (MQE), OLAP Tools and The Internet.

Unit II: (Data Mart and Data Mining Tools)

Data Mart: Data Mart, Type of Data Mart, Loading a Data Mart, Metadata for a Data Mart, Data Model for a Data Mart, Software Component for a Data Mart, Tables in Data Mart, Security in Data Mart. **Data Mining and Tools:** Introduction, From Data Warehouse to Data Mining, Steps of Data Mining, Data Mining Algorithm, Database Segmentation, Predictive Modeling, Link Analysis, Tools for Data Mining.

Unit III: (SQL Server, Components and Queries)

SQL Server Architecture: SQL Server Data Storage Architecture, The Data Engine, System Databases. **SQL Components:** SQL's Basic Object, Data Types, Transact-SQL Functions, Scalar Operators, Null Values. Data Definition Language, Data Manipulation Language, Queries, Modification of Table Contents, Stored Procedures and User-Defined Functions, Views.

Unit IV: (Data Integrity, User Security and Concurrency Control)

Managing Data Integrity: Data Integrity Controls, Working with Constraints, DML Triggers. **Managing User Security:** Security Architecture, Implementing SQL Server Principles and Authentication, Implementing Permission in SQL Server. **Backup and Concurrency Control:** Transaction Architecture, Locking, Backup Types, Performing Database Restore, Replication, Using Transaction Logs, Using Triggers, Replication Methods.

Books:

1. C.S.R. Prabhu, "Data Warehousing", PHI, 3rd Ed., 2010, ISBN-978-81-203-3421-2.
2. Dusan Petkovic, "Microsoft SQL Server 2008, Beginner S Guide", TMH Pub., 1st Edition, 2008, ISBN-0071540383.
3. Michel Lee, Gentry Bieker, "Mastering SQL Server 2008", Sybex Pub., 1st Ed., 2009, ISBN-047028904x.

References:

1. Jiawei Han, Micheline Kamber, Jian Pei, "Data Mining Concepts and Techniques", Elsevier Pub. 3RD Ed, 2011, ISBN-9780123814791.
2. Alex Berson, "Data Warehousing, Data Mining & OLAP", TMH, ISBN 0-07-058741-8
3. Robert Vieira, "Beginning Microsoft SQL Server 2008 Programming", Wrox Publication, 2009, ISBN-9780470257012.

M.Sc. (Computer Science) - I
SEMESTER - II
PAPER-1: THEORY OF COMPUTATION AND SYSTEM PROGRAMMING (2MSc1)

Unit-I : (Finite Automation and Regular Expression)

Finite Automation and Regular Expression : Finite State Systems, Basic Definitions, Non - Deterministic Finite Automata, Finite Automata with Moves, Regular Expressions, Two Way Finite Automata, Finite Automata with Output, Application on Finite Automata.

Properties of Regular Sets: The Pumping Lemma for Regular Sets, Close Properties of Regular Sets, Decision Algorithms for Regular Sets.

Context Free Grammars : Motivation and Introduction, Context Free Grammar, Derivation Tree, Simplification of Context Free Grammars, Chomsky Normal form, Greibach Normal form, The Existence of Inherently Ambiguous Context Free Languages.

Unit-II : (Push Down Automata and Turing Machine)

Push Down Automata: Informal Description, Definitions, Push Down Automata and Context Free Languages.

Turing Machine : Introduction, The Turing Machine Model, Computable Languages and Functions , Techniques Turing Machine Construction, Modification of Turing Machines, Church's Hypothesis, Turing Machine As Enumerators, Restricted Turing Machine Equivalent to The Basic Model.

Chomsky: Regular Grammars, Unrestricted Grammars, Context Sensitive Languages, Relation between Classes of Languages.

Unit-III: (Introduction to Device Drivers)

Introduction to Device Drivers: Role of Device Drivers, Splitting The Kernel, Classes of Devices and Modules, Security Issues, Version Numbering, Building and Running Modules Kernel Modules Vs. Applications, Compiling and Loading, Kernel Symbol Table, Preliminaries, Interaction and Shutdown, Module Parameters, Doing It in User Space.

Unit-IV: (Assembly and Machine Languages)

Assembly and Machine Languages: CPU Architecture of 8086 Family, Function, Procedure and General Purpose Registers, Memory Segmentation and Address Computation, Addressing Modes, Instructions Set and formats. Different Types of Instruction, Processing of Binary, ASCII and BCD Data, Stacks, Calls, Returns, Near and Far Procedures. Interrupts and Their Routines, Definitions and Recursive Macros, Assemblers, Overview of Compilation Process.

Loaders and Linkers: Loading Schemes, Linking, Relocation and Program Relocation.

Books:

1. Donovan J.J, "Systems Programming", New York, TMH, ISBN-0-07-460482-1
2. Dhamdhere, D.M., "System Programming", TMH, ISBN-0-7-133311-8
3. John E. Hoperott and Jeffery D.Ullman, "Introduction to Automata Theory, Languages and Computation".
5. E. V. Krishmamoorty, "Theory of Computer Science", ISBN-088791255x.

References:

1. Adam Hoover, "System Programming with C and UNIX", Pearson, ISBN-0136076602.
2. D. I. A. Cohen," Introduction to Computer Theory", ISBN-0-471-13772-3.
3. H.R.Lewis and C.H.Papadimitrion, "Elements of Theory of Computation", PHI, ISBN- 0132624788

M.Sc. (Computer Science) - I
SEMESTER - II
PAPER-2: EVENT DRIVEN PROGRAMMING WITH VB.NET
(2MSc2)

Unit –I: (Introduction to .Net)
Introduction to .Net Framework, Basic Functionality of CLR, MSIL, About Platform Independency, Language Interoperability, CTS and CLS, .Net Languages, Assemblies, Garbage Collection, Architecture of GC and Application Domain

Unit - II: (Visual Studio.Net)
WPF Designer and Windows form Integration, Multi-Framework Targeting, Better Intelligent Support, Refactoring and Enhancements, Visual Studio Split View, Debugging The .Net Source Code
VB.Net Language: Features of VB.Net, Writing Programs in VB.Net, Compiling and Execution from Command Prompt
Data Types, Expressions and Operators: Option Statements, Basic Element of Programming (Data types, Variable, Constant, Control Flow Statement), Type Casting, Boxing and Unboxing, Built-in Functions in VB.Net, Sub Programs and Working with Arrays

Unit -III: (Object oriented Programming with VB.Net)
Principles of OOP, Data Encapsulation, Data Abstraction, Properties, Method Overloading, Constructors, Inheritance, Overloading and Overriding, Shadowing, Abstract Classes and Sealed Class, Polymorphism, **Delegate-** Unicast and Multicast, Events, Collections, Directories, Strings, String Builders, Attributes, Namespaces and Generics
Windows Applications: Introduction to System.Windows.forms.Dll, Basic Controls and Event Driven Programming, Programming with Advanced Controls. **Windows Control Library**
Error Handling: Structured Error Handling, Error Categories, Debug and Trace Classes, Code Optimization, Testing Phases and Strategies

Unit - IV: (Data Access with ADO.Net)
Introduction to Access Libraries DAO,RDO,ADO, Limitation of ADO, ADO.Net Objects and Usage, ADO.Net Managed Providers, Data Reader, Data Adapter and Dataset, Data Relation and Dataset, Data Binding, Connected and Disconnected Environments, Connection Pooling, ADO.Net Exceptions, Using Stored Procedures, N-Tier Database Application, ADO.Net and XML. File Stream, Windows Services, Crystal Reports

Books:

1) David I. Schneider, "an Introduction to Programming Using Visual Basic .Net", PHI, ISBN-81-203-2159-6
2) Shirish Chavan, "Visual Basic .Net", Pearson, ISBN-81-317-1391-1
3) Mastering Crystal Report, BPB.

References:

1) Jeffrey R. Shapiro, "The Complete References -Visual Basic .Net", TMH, ISBN-0-07-049511-4
2) Anne Prince and Doug Lowe, "March's VB.Net Database Programming with ADO.Net".
3) Crystal Report – The Complete References, TMH

M.Sc. -I
Semester-II
Paper-3: Digital Communication and Networking
(2MSc3)

Unit-I: (Data Communication)

Data Transmission: Concept and Terminology, Analog and Digital Data Transmission, Transmission Impairment, Transmission Media. **Data Encoding**- Digital Data, Analog Data, Digital Signal, Analog Signal. **Digital Data Communication-** Asynchronous and Synchronous Transmission, Error Detection Technique, Interfacing. **Data Link Control-** Line Configurations, Flow Control, Error Control, Data Link Control Protocols. Multiplexing Frequency Division Multiplexing, Synchronous Time Division Multiplexing.

Unit-II: Data Communication Networking

Circuit Switching: Communication Networks, Circuit Switching, Single Node Network, Digital Switching Concept, Control Signaling. Packet Switching- Packet Switching Principles, Virtual Circuits and Data Grams, Routing, Traffic Control, X.25. LAN and MAN- LAN, MAN Technology, Bus, Trees and Star Topologies, Optical Fiber Bus, Ring Topology, Medium Access Control Protocols, LAN, MAN Standards.

Unit-III: (Communication Architecture)

Protocols and Architecture: Protocols, The Layered Approach, OSI Model, TCP/IP Protocol Suite, System Network Architecture. **Internetworking-** Principles of Internetworking, Bridge, Routing with Bridges, Connectionless Internetworking, Connectionless Internetwork Protocol, Router-Level Protocol, Connection oriented Internetworking.

Unit-IV: (Digital Network)

Transport Protocols: Transport Services, Protocol Mechanism, Network Services, ISO Transport Standards, TCP and UDP, Light Weight Transport Protocol. **Session Service and Protocols-** Session Characteristics, OSI Session Service Definition, OSI Session Protocols Definition. ISDN and Broadband ISDN, The Integrated Digital Network, Overview of ISDN, Transmission Structure, User Access, Isdn Protocols, Broadband ISDN.

Book:

1. William Stalling, “Data and Computer Communication”, PHI, ISBN-0131392050.
2. forouzan, “Data Communication and Network”, TMH, ISBN-0072923547.

Refarence:

1. Tanenbaum,”Computer Networks”, 3rd Edition, PHI, ISBN-0131651838.
2. Comer, “Internetworking with TCP/IP Vol-1”, PHI, ISBN-978-81-203-2998-0.

M.Sc. (Computer Science) - I
SEMESTER - II
PAPER-4: (ELECTIVE-I): PATTERN RECOGNITION
(2MSc4.1)

Unit-I: (Introduction to Pattern Recognition, Bayesian Decision Theory)
Introduction to Pattern Recognition, Bayesian Decision Theory: Classifiers, Discriminates Functions, Decision Surfaces, Normal Density and Discriminates Functions, Discrete Features

Unit-II: (Maximum Likelihood and Bayesian Estimation)
Maximum Likelihood and Bayesian Estimation: Parameter Estimation Methods, Maximum Likelihood Estimation, Bayesian Estimation, Bayesian Parameter Estimation, Gaussian Case, General Theory, Problem of Dimensionality, Accuracy, Dimension, and Training Sample Size, Computational Complexity and Over fitting, Component Analysis and Discriminates, Principal Component Analysis (PCA), Expectation Maximization (EM), Hidden Markov Models for Sequential Pattern Classification, First-order Markov Models, First-order Hidden Markov Models, Hidden Markov Model Computation, Evaluation, Decoding and Learning.

Unit-III: (Non-Parametric)
Non-Parametric: Density Estimation, Parzen-Window Method, Probabilistic Neural Networks (PNNS), K-Earest Neighbor, Estimation and Rules, Nearest Neighbor and Fuzzy **Classification.**
Linear Discriminate Function Based Classifiers: Perceptron, Linear Programming Algorithm, Support Vector Machines (SVM)

Unit-IV: (Multilayer Neural Network)
Multilayer Neural Network: Feed forward Classification, Back Propagation Algorithm, Error Surface Stochastic Data: Stochastic Search, Boltzmann Learning, Evolutionary Method and Genetic Programming. **Metric Methods for Pattern Classification:** Decision Trees, Classification and Regression Trees (Cart) and Other Tree Methods, String Recognition and Rule Based Method. Unsupervised Learning and Clustering : Mixture Densities and Identifiability, Maximum Likelihood Estimation, Application Normal Mixture, Unsupervised Bayesian Learning, Data Description and Clustering, Hierarchical Clustering, Graph Theory Method, Problem of Validity, Component Analysis

Books:

1) R.O. Duda, P.E.Hart and D.G.Stork, "Pattern Classification 2nd Edition", John Wiley, 2007, ISBN-978-1-4244-8501-7.
2) Christopher M. Bishop, "Neural Network for Pattern Recognition", Oxford Ohio Press, ISBN-0201180758.

References:

1) E. Gose, R. Johansonbargh, "Pattern Recognition and Image Analysis", PHI, ISBN-9780201180758.
2) EThen Alpaydin, "Introduction to Machine Learning", PHI, ISBN-0-262-01243-x.
3) Satishkumar, "Neural Network- a Classroom Approach", TMH, ISBN-0-324-06680-5.
4) Dr. Rao and Rao,"Neural Network and Fuzzy Logic", ISBN-8170296943.
5) S. S.Theodoridis and K.Koutroumbas, "Pattern Recognition", 4th Ed., Academic Press,
6) C.M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2006, ISBN-0387310738.

M.Sc. (Computer Science) - I
SEMESTER - II
PAPER-4: (ELECTIVE-I): SCRIPTING LANGUAGE AND INFORMATION RETRIEVAL
(2MSc4.2)

Unit- I: (HTML and Linking)

HTML - Introduction to HTML, Creating HTML Documents, Creating Web Pages with HTML **Tags:** HTML, Head, Title, Body ,Heading , Paragraph Tags, Alignment, formatting, Font Size, Attributes, List, Character formatting : Logical Verses Physical Style, Logical and Physical Style, Changing The Colors of The Fonts, Multiple Tags. **Linking:** Relative Pathnames Verses Absolute Pathnames, URL, Links to Specific, Sections within the Current Document, Mailto.
Inline Images: Images Size Attributes, Inline Images, Alternate Text Images, Images a **Hyperlink Frames and Tables:** Table Row and Columns, Creating Simple Tables, Spanning Row and Columns with HTML Tables, Spanning Rows and Columns, Table Alignment Properties. **Forms:** Field Types, How to Build a form, Connectivity with oracle or Access.

Unit-III: (VB Script)

Introduction VB Script: Evolution of Scripting Language, Introduction to VB Script, Features of VB Script, Data Types in VB Script, Elements of VB Script: Identifiers, Operators, Control Statements, Control Structure,
Functions: Variant Function, Math Function, formatting Function, String Manipulation Function, Type Conversion Methods Supported by VB Script, Arrays in VB Script, Regular Expression

Unit-II: (Java Script)

Java Script: The Nature of Java Script, Script, Script Writing Basic, Auditioning of Interactivity to a Web Page. Creating Dynamic Web Pages, Java Scripting Your forms. Creating Scrolling Messages Animating a Graphics, Creating a Floating Toolbar, Setting Up Tool Bar. Window, Designing Image Map Navigation

Unit-IV: (Information Retrieval)

Information Retrieval- Boolean Retrieval ,The Term Vocabulary and Postings Lists, Dictionaries and Tolerant Retrieval, Index Construction, Index Compression, Scoring, Term Weighting and The Vector Space Model, Computing Scores in a Complete Search System, Evaluation in Information Retrieval, Relevance Feedback and Query Expansion, XML Retrieval, Probabilistic Information Retrieval

Books:

1. C.Xavier ,"Web Technology and Design", ISBN-812214508/9788122414509.
2. O'relly "Dynamic HTML" SPD, ISBN-978-56592-494-9.
3. Harris, "Java Script Programming for The Absolute Beginner", PHI, ISBN-8120319915.
4. Prabhakar Raghavan and Hinrich Schütze ,"Introduction to Information Retrieval Christopher D. Manning", ISBN-0521865719

References:

1. "Web Application", NIIT Prentice Hall of India, ISBN- 81-203-2714-4
2. "Dynamic HTML in Action", PHI, ISBN-978-81-203-3872-2.

"Java Script Unleashed", SAM, ISBN-9780672317637

M.Sc. (Computer Science) - I
SEMESTER - II
PAPER-4 (ELECTIVE-I): MOBILE COMPUTING
(2MSc4.3)

Unit-I: (Mobile Communications)

Mobile Communications an Overview: Mobile Communication, Mobile Computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Data Dissemination, Mobility Management, **Security Mobile Devices and Systems:** Mobile Phones, Digital Music Players, Handheld Pocket Computers, **Handheld Devices:** Operating Systems, Smart Systems, Limitations of Mobile Devices, **Automotive Systems GSM and Similar Architectures:** GSM-Services and System, Architecture, Radio Interfaces, Protocols, Localization, Calling Handover, Security.

Unit-II: (Wireless Medium Access Control and CDMA Based Communication)

Wireless Medium Access Control and CDMA Based Communication: Medium Access Control, Introduction to CDMA-Based Systems, Spread Spectrum in CDMA Systems, Coding Methods in CDMA, Is-95 CDMA One System, IMT- 2000, I - MODE, OFDM, Mobile IP **Network Layer:** IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation Route Optimization, Dynamic Host Configuration Protocol

Unit-III:(Databases)

Databases: Database Hoarding Techniques, Data Caching, Client-Server Computing and Adaptation, Transactional Models, Query Processing, Data Recovery Process, Issues Relating to Quality of Service, **Data Dissemination and Broadcasting Systems:** Communication Asymmetry, Classification of Data-Delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Techniques, Digital Audio Broadcasting, Digital Video Broadcasting.

Unit-IV: (Mobile Devices Server and Management)

Mobile Devices Server and Management: Mobile Agent, Application Server, Gateways, Portals, Service Discovery, Device Management, Mobile File Systems, Security, **Mobile Adhoc and Sensor Networks:** Introduction to Mobile Ad-Hoc Network, Wireless Sensor Networks, Applications Wireless LAN, Mobile Internet Connectivity, and Personal Area Network: Wireless LAN (WIFI) Architecture and Protocol Layers, WAP 1.1 and WAP 2.0, Architectures,

Books :

1) Raj Kamal, "Mobile Computing", Oxford, ISBN-0195680772/9780195686777.

References:

1) Jochen Schiller, "Mobile Comunications", Addison-Wesley, ISBN-01398362/9780201398366.
2) Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, ISBN-0471413028.
3) "Mobile Computing Principles", Designing and Developing Mobile, ISBN-0521817331.
4) Reza Behravanfar, "Applications with UML and XML", Cambridge University Press, ISBN-0521817331.