



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

SCHEME & Syllabus For

MASTER OF SCIENCE (COMPUTER SCIENCE / INFORMATION TECHNOLOGY)

MSC (CS/IT)

(Effective From July 2017 Session)

SEMESTER –I

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
M-101	Artificial Intelligence	4	1		80	20		100
M-102	Computer Networking	4	1		80	20		100
M-103	Design & Analysis of Algorithms	4			80	20		100
M-104	Dot Net Technology	4			80	20		100
M-105	Practical – I (Design & Analysis of Algorithms)			3			50	50
M-106	Practical – II (Dot Net Technology)			3			50	50
SEMESTER TOTAL								500

(*L-Lecture, T-Tutorial, P-Practical)

SEMESTER –II

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
M-201	Software Engineering	4	1		80	20		100
M-202	Computer Graphics	4			80	20		100
M-203	Programming with Java	4			80	20		100
M-204	Unix and Shell Programming	4	1		80	20		100
M-205	Practical – I (Computer Graphics)			3			50	50
M-206	Practical – II (Programming with Java)			3			50	50
SEMESTER TOTAL								500

(*L-Lecture, T-Tutorial, P-Practical)



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

SEMESTER –III

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
M-301	Mobile Computing	4	1		80	20		100
M-302	Advanced Java	4			80	20		100
M-303	Cloud Computing	4			80	20		100
M-304	Theory of Computation	4	1		80	20		100
M-305	Practical – I (Advanced Java)			3			50	50
M-306	Practical – II (Cloud Computing)			3			50	50
SEMESTER TOTAL								500

(*L-Lecture, T-Tutorial, P-Practical)

SEMESTER –IV

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
M-401	Data Warehousing and Mining	4	1		80	20		100
M-402	Web Designing & Web Technology	4	1		80	20		100
M-403	Project work		4	4		100	200	300
SEMESTER TOTAL								500

(*L-Lecture, T-Tutorial, P-Practical)



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Artificial Intelligence & Applications

Semester –I

Unit-I

General Issues and Overview of AI The AI problems, what is an AI technique, Characteristics of AI applications. Introduction to LISP Programming: Syntax and numeric functions, Basic list manipulation functions, predicates and Conditionals, input output and local variables, iteration and recursion, property lists and arrays

Unit-II

Problem Solving, Search and Control Strategies General problem solving, production systems, control strategies forward and backward chaining, Exhaustive searches depth first breadth first search. Heuristic Search Techniques Hill climbing, branch and bound technique, best first search & A* algorithm, AND / OR graphs, problem Reduction & AO* algorithm, constraint satisfaction problems.

Unit-III

Knowledge Representations First order predicate calculus, skolemization, resolution principle & unification, interface mechanisms, Horn's clauses, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.

Unit-IV

Natural Language processing: Parsing techniques, context free grammar, recursive transitions nets (RNT), augmented transition nets (ATN), case and logic grammars, syntactic analysis. Game playing Minimax search procedure, alpha-beta cutoffs, additional refinements. Planning Overview an example domain the block world, component of planning systems, goal stack planning, non linear planning.

Unit-V

Probabilistic Reasoning and Uncertainty: Probability theory, bayes theorem and bayesian networks, Certainty factor. Expert Systems Introduction to expert system and application of expert systems, various expert system shells, vidwan frame work, knowledge acquisition, case studies, MYCIN. Learning Rote learning, learning by induction, explanation based learning.

Books:

1. Elaine Rich and Kevin Knight "Artificial Intelligence" - Tata McGraw Hill.
2. Dan W. Patterson "Introduction to Artificial Intelligence and Expert Systems", Prentice India.
3. Nils J. Nilson "Principles of Artificial Intelligence", Narosa Publishing House.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Computer Networks

UNIT-I

Introduction: Computer Network, Layered Network Architecture-Review of ISO-OSI Model., Transmission Fundamentals-, Communication Media-Conductive Metal (Wired Cable), Optical Fiber links, Wireless Communication-Radio links, Satellite Links, Communication Services & Devices, Telephone System., Integrated Service Digital Network (ISDN)., Cellular Phone., ATM, Modulation & Demodulation-, Digital to Analog Conversion-Frequency Modulation (FM), Amplitude, Modulation (AM), Phase Modulation (PM)., Analog to Digital Conversion-Pulse Amplitude Modulation(PAM), Pulse Code Modulation (PCM), Differential Pulse Code Modulation, (DPCM)., Modem & Modem Types., Multiplexing-, Frequency Division Multiplexing (FDM)., Time Division Multiplexing (TDM), Statistical Time Division Multiplexing(STDM)., Contention Protocol-, Stop-Go-Access Protocol, Aloha Protocol- Pure aloha & Slotted aloha, Carrier sense multiple access with collision detection (CSMA/CD).

UNIT-II

Data Security and Integrity: Parity Checking Code, Cyclic redundancy checks (CRC), Hemming Code, Protocol Concepts –, Basic flow control, Sliding window protocol-Go-Back-N protocol and selective repeat protocol, Protocol correctness- Finite state machine.

UNIT-III

Local Area Network: Ethernet: 802.3 IEEE standards, Token Ring: 802.5 IEEE standard, Token Bus: 802.4 IEEE standard, FDDI Protocol, DQDB Protocol, Inter Networking, Layer 1 connections- Repeater, Hubs, Layer 2 connections- Bridges, Switches, Layer 3 connections- Routers, Gateways.

UNIT-IV

Wide Area Network: Introduction, Network routing, Routing Tables, Types of routing, Dijkstra's Algorithm, Bellman-Ford Algorithm, Link state routing, Open shortest path first, Flooding, Broadcasting, Multicasting, Congestion & Dead Lock, Internet Protocols, Overview of TCP/IP, Transport protocols, Elements of Transport Protocol, Transmission control protocol (TCP), User data-gram protocol (UDP).

UNIT-V

Network Security, Virtual Terminal Protocol, Overview of DNS, SNMP, email, WWW, Multimedia.

BOOKS:

1. A.S.Tanenbaum, "Computer Network", 4th addition, PHI
2. Forouzan "Data Communication and Networking 3ed", TMH
3. D.E.Comer, "Internetworking with TCP/IP", Volume Ist & IInd, PHI
4. Willium Stalling, "Data & Computer communications", Maxwell Macmillan International Ed



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Design and Analysis of Algorithms

UNIT-I

Pre-requisites: Data structure & Discrete structures, models of computation, algorithm analysis, order Architecture, time space complexities average and worst case analysis.

UNIT-II

Divide and conquer: Structure of divide-and-conquer algorithms: examples; Binary search, quick sort, Strassen Multiplication; Analysis of divide and conquer run time recurrence relations. Graph searching and Traversal: Overview, Traversal methods (depth first and breadth first search)

UNIT-III

Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum Cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths. Branch and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem, searching & sorting algorithms.

UNIT-IV

Dynamic programming: Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Traveling salesman Problem, longest Common sequence. Back tracking: Overview, 8-queen problem, and Knapsack problem

UNIT-V

Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples. Combinational algorithms, string processing algorithm, Algebraic algorithms, set algorithms

BOOKS:

1. Ullman "Analysis and Design of Algorithm" TMH
2. Sara Basse, A. V. Gelder, "Computer Algorithms," Addison Wesley
3. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer algorithm," PHI
4. E. Horowitz, S. Sahni, and S. Rajsekaran, "Fundamentals of Computer Algorithms," Galgotia Publication



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Dot Net Technology

UNIT I

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms.

UNIT II

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization and Persistence, Serializing an Object, Deserializing an Object. Delegates and Reflection.

UNIT III

Overview of Dynamic Web page, introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS, Web forms, web form controls -server controls, client controls, Adding controls to a web form, Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project, Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.

UNIT IV

Overview of ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets , using Command & Data Reader, binding data to data bind Controls, Displaying data in data grid, XML in .NET , XML basics, attributes, fundamental XML classes: Document, Textwriter, Textreader. XML validations, XML in ADO.NET, The XML Data Documents.

UNIT-V

Web services: Introduction, State management- View state, Session state, Application state. SOAP, web service description language, building & consuming a web service, Web Application deployment. Caching, Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization, Security features of .NET, Role based security & Code access security, permissions,

BOOKS:

1. ASP.NET 3.5 BLACK BOOK (COVERS C# AND VB 2008 CODES) - DREAMTECH PUBLICATION
2. THE COMPLETE REFERENCE ASP.NET BY MATHEW MACDONALD - TMH
3. PROFESSIONAL ASP.NET- WROX PUBLICATION
4. INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

M-201

Software Engineering

Semester II

UNIT – I

Software : Software Characteristics and Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model, Incremental Model and Spiral Model. Project Metrics : Software Measurement–Size Oriented, Function Oriented Metrics, Extended Function Point Metrics.

UNIT - II

Software Project Planning: Objectives, Decomposition Techniques, and Empirical Estimation Models. Analysis Concept and Principles: Requirement Analysis, Analysis Principles.

UNIT – III

Design Concepts and Principles: Design Process, Design Concepts, Design Principles, Effective Modular Design, Human Computer Interface Design, Interface Design Guidelines.

UNIT – IV

S/W Quality Assurance : Quality Concepts, Reliability S/W Testing Models : S/W Testing Fundamentals, White and Black Box Testing, Basic Path Testing, Testing Strategies : Strategic Approach to S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing,

UNIT - V

S/W Reuse: Reuse Process, Classification and Retrieving Components, Economics of S/W Reuse, CASE: Introducing to CASE, Taxonomy of Case Tools.

BOOKS:

1. *SOFTWARE ENGINEERING BY R.S.PRESSMAN*
2. *AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING BY PANKAJ JALOTE*



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

M-202

Computer Graphics

Unit-I

What is Graphics, Application of Graphics, Elements of Graphics Workstation, Graphics I/P Devices Keyboard, Trackball, Joystick, Light Pen, Digitizing Tables, Mouse, Touch Panels, Image Scanners. Graphics Display Devices-Raster Scan System, Random Scan System, Arch of Vector and Raster Scan Display, Refresh CRT, Gray S Hade.

Unit-II

DRAWING GEOMETRY: Point – Plotting, Coordinate System, Point Plotting, Line Drawing –Line Segments, Line Drawing Algo : DDA Algo, Bresenham’s Line Algorithm. Circle Drawing Polygon Representation Ellipse, Rectangle, Filling – Filled Area Primitives, Scan Line Polygon Fill Algo, Flood Fill Algo, Boundary Fill Algorithm

Unit-III

2D Geometric Transformation : Translation, Rotation, Scaling, Geometric Transformation, Coordinate Transform and Composite Transformation, 2D Viewing Transformation & Clipping : World Coordinate System (WCS), Normalized Device Coordinate System , Windows Viewing View Ports Viewing, Point Clipping, Line Segment Clipping, Coahen – Sutherland, Line Clipping, Polygon Clipping.

Unit-IV

3D Geometric Transformation 3D Geometric Transformation: Translation, Rotation, Scaling, Coordinate Transform Geometric Transformation Composite Transformation, 3D Display Methods – Parallel Projection, Perspective Projection 3D Viewing & Clipping.

Unit-V

Segment, Segment Table, Segment Creation, Deletion, Closing, Renaming, Curve Generation , B – Spline Curves, Bezier Curves, Hidden Surface, Z – Buffer Algorithm, Scan Line Algorithm, Painters Algorithm, Depth Comparisons.

Books

1. D. Hearn and M.P. Baker “Computer Graphics” (2nd ed), PHI.
2. COMPUTER GRAPHICS: SCHAUM’S OUTLINE SERIES
3. Roger S. David “Procedural Elements for Computer Graphics”, McGraw Hill.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

M-203

Programming with Java

UNIT-I

The Java Environment: History of Java: Comparison of Java and C++; Java as an object oriented language: Java buzzwords; A simple program, its compilation and execution; the concept of CLASSPATH; Basic idea of application and applet; Basics: Data types; Operators- precedence and associativity; Type conversion; The decision making – if, if ..else, switch; loops – for, while, do...while; special statements–return, break, continue, labeled break, labeled continue; Modular programming methods; arrays; memory allocation and garbage collection in java keywords. Object Oriented Programming in Java: Class; Packages; scope and lifetime; Access specifiers; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection in java keywords Inheritance : Inheritance basics, method overriding, dynamics method dispatch, abstract classes.

UNIT-II

Interfaces : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces. Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread; Creating thread with the thread class and runnable interface; Thread synchronization; Thread scheduling; Producer-consumer relationship; Daemon thread, Selfish threads; Basic idea of exception handling; The try, catch and throw; throws Constructor and finalizers in exception handling; Exception Handling.

UNIT-III

Applets: Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for applet. The AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers flow layout, Grid layout, Border layout, Card layout. The Java Event Handling Model: Java's event delegation model – Ignoring the event, self contained events, Delegating events; The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Eey Event, Mouse Event, Text Event, Window Event.

UNIT-IV

Input/output: Exploring Java i.o., Directories, stream classes The Byte stream: Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. JDBC: JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the resultset object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-V

Networking & RMI: Java Networking: Networking Basics: Socket, Client server, reserved sockets, proxy Servers, Inet address, TCP sockets, UDP sockets. ; RMI for distributed computing; RMI registry services; Steps of creating RMI Application and an example. Collections: The collections framework, collection interfaces, collection classes.

BOOKS

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Deitel "Java- How to Program." Pearson Education, Asia
3. Horstmann & Cornell "Core Java 2" (Vol I & II), Sun Microsystems
4. Ivan Bayross "Java 2.0" : BPB publications
5. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

M-204

UNIX & Shell Programming

Unit-I

General Overview of the System: System structure, user perspective, O/S services assumption about Hardware The Kernel and buffer cache architecture of Unix O/S, System concepts, Kernel data Structure, System administration, Buffer headers, Structure of the buffer pool, Scenarios for retrieval of the buffer, Reading and writing disk block, Advantage and disadvantage of buffer cache.

Unit-II

Internal Representation of Files: INODES, Structure of regular, Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks. System Calls for the System: Open read write file and record close, File creation, Operation of special files change directory and change root, change owner and change mode, STAT and FSTAT, PIPES Mounting and unmounting files system, Link Unlink.

Unit-III

Structures of Processes and process control: Process states and transitions layout of system memory, the context of a process, manipulation of process address space, Sleep process creation/termination. The user Id of a process, changing the size of a process. The SHELL Interprocess Communication and multiprocessor system: Process tracing system V IPO network communication sockets problem of multiprocessors systems, solution with master and hare process, and solution with semaphores.

Unit-IV

Introduction to shell scripts: shell Bourne shell, C shell, Unix commands, permissions, editors, filters sed, grep family, shell variables, scripts, metacharacters and environment, if and case statements, for while and until loops. Shell programming.

Unit-V

Awk and perl Programming: Awk pattern scanning and processing language, BEGIN and END patterns, Awk arithmetic and variables, Awk built in variable names and operators, arrays, strings, functions, perl; the chop() function, variable and operators, \$_ and \$. , Lists, arrays, regular expression and substitution, file handling, subroutines, formatted printing. Linux: History & Features of Linux, Linux structure, various flavours of linux.

Books

1. M.J. Bach “Design of UNIX O.S. “, Prentice Hall of India.
2. Y.Kanetkar “Unix shell programming”, BPB Pub.
3. Linux complete, BPB Publications
4. Sumitabha Das “ Unix concepts and Applications



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Mobile Computing

Semester -III

Unit-I

Overview of OSI Model: Significance of layered Model, PDUs, SDUs, IDUs, Higher layer Protocols. Switching and Components. Introduction, Applications, history, of wired & wireless Communication Systems. Radio Transmission: frequencies, signal propagation, antenna, types of modulation, FHSS, DSSS. Multiple Access technology for Wireless Communication: FDMA, TDMA, CDMA Cellular System: Introduction, types.

Unit-II

Mobile Data Communication: Cellular Telephony, Structure, Hand off Management, Switching and authentication, MTSO interconnections, frequency hopping, frequency reuse. Circuit Switched Data Services & Packet Switched Data Services on Cellular Networks, Personal Communication Systems (PCS) Architecture, Digital Enhanced Cordless Telecommunications (DECT,) Personal Access Comm. System (PACS).

Unit-III

Digital Cellular Systems and Standards: GSM System overview, Architecture, GSM Protocol Model, GSM Mobility Management, SMS security aspects. Broadcast System overview. General Packet Service (GRPS) Architecture, GRPS Network, Interfaces and Procedures (2.5 G), 3G Mobile Services: UMTS and International Mobile Telecommunications (IMT-2000), W-C DMA and CDMA 2000, Quality of service in 3G.

Unit-IV

WLAN: Components and working of Wireless LAN, Transmission Media for WLAN, Infrastructure & Types of WLAN, IEEE 802.11 Standards, Protocols for WLAN, MACA, MACAW, Infrared technology. Wireless Application Protocol (WAP) model, architecture, Gateway, WAP protocols and WML.

Unit-V

Introduction to Bluetooth technology, Wireless in local loop (WLL) architecture, products, Satellite as a switch, Components of VSAT system, VSAT topologies, access schemes

Books :

1. Jochen Schiller "Mobile Communication", Pearson Education.
2. Raj Panadaya "Mobile and Personal Communication System & services
3. Lee "Mobile Cellular Telecom" 1995 Mc Graw Hill



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Advanced Java

UNIT I

Introduction & Requirements - Introduction to HTML Java Server Pages – Basics – JSP Constructs – Scripting elements - directives - actions – beans – tags Introduction to apache tomcat server (installation & configuration)- start/stop tomcat services – run jsp page on tomcat

UNIT II

JSP implicit objects, Handling Request Parameters – Form Handling (text fields / text area) – Handling multiple buttons/check boxes/radios/combo - Session Management – URL Rewriting - Hidden fields – cookies –

UNIT III

Introduction to Servlet- Servlet Life Cycle – ServletRequest & ServletResponse – Writing Servlets – Requirements & Configuration ServletRequest & ServletResponse Methods & use – sending different types of data

UNIT IV

Introduction to MySQL –features, installation & configuration, creating & managing database, MySQL Driver Java Database Connectivity (JDBC) with MySql –loading MySql driver – creating connection – Statement – ResultSet

UNIT V

Java Naming Directory Interfaces – JMS – Introduction – Topic – example of Topic & Queue – EJB – Basics – stateless / client creation – statefull client creation – Container Managed Persistence – Bean Managed Persistence

BOOKS:

1. *JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMH PUBLICATION ISBN 0-07-463769-X*
2. *PROGRAMMING WITH JAVA BY E. BALAGURUSWAMY TMH PUBLICATIONS ISBN 0-07-463542-5*
3. *USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-8*



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Cloud Computing

Unit-I

Introduction to Cloud Computing, Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS Cloud computing platforms: Infrastructure as service: Amazon EC2, Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.

Unit-II

Introduction to Cloud Technologies, Study of Hypervisors Compare SOAP and REST Web services, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization Multitenant software: Multi-entity support, Multi-schema approach, Multitenance using cloud data stores, Data access control for enterprise applications.

Unit-III

Data in the cloud: Relational databases, Cloud file systems: GFS and HDFS, Big Table, HBase and Dynamo. Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using MapReduce, Introduction to cloud development, Example/Application of Map reduce, Features and comparisons among GFS, HDFS etc, Map-Reduce model .

Unit-IV

Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security Cloud computing security challenges: Virtualization security management virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

Unit-V

Issues in cloud computing, Implementing real time application over cloud platform Issues in Inter cloud Environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud

Books

1. *Google Apps* by Scott Granneman, Pearson
2. *Cloud Security & Privacy* by Tim Malhar, S.Kumaraswamy, S.Latif (SPD, O'REILLY)
3. *Cloud Computing : A Practical Approach*, Antohy T Velte, et.al McGraw Hill,



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Theory of Computation

Unit-I

Review of Mathematical Preliminaries: Set, Relations and functions, Graphs and trees, string, alphabets And languages. Principle of induction, predicates and propositional calculus. Theory of Automation: Definition, description, DFA, NFA, Transition systems, 2DFA, equivalence of DFA & NDFA, Regular expressions, regular grammar, FSM with output (mealy and moore models), Minimization of finite automata.

Unit-II

Formal Languages: Definition & description, Parse structured grammars & their classification, Chomsky classification of languages, closure properties of families of language, regular grammar, Regular set & their closure properties, finite automata, equivalence of FA and regular expression, Equivalence of two way finite automata, equivalence of regular expressions.

Unit-III

Context-Free grammar & PDA: Properties unrestricted grammar & their equivalence, derivation tree Simplifying CFG, unambiguifying CFG, ϵ -productions, normal form for CFG, Pushdown automata, 2 Way PDA, relation of PDA with CFG, Determinism & Non determinism in PDA & related theorems, Parsing and pushdown automata.

Unit-IV

Turing Machine: Model, design, representation of TM, language accepted by TM, universal turing Machine, determine & non-determinism in TM, TM as acceptor/generator/algorithms, multidimensional, Multitracks, multitape, Two way infinite tape, multihead, Halting problems of TM.

Unit-V

Computability: Concepts, Introduction to complexity theory, Introduction to undecidability, recursively Enumerable sets, primitive recursive functions, recursive set, partial recursive sets, concepts of linear Bounded Automata, context sensitive grammars & their equivalence

Books

1. Hopcroft & Ullman "Introduction to Automata theory, languages & Computation", Narosha Publishing house.
2. Peter Linz, "An Introduction to formal language and automata", Third edition, Narosa publication.
3. Marvin L. Minskay "Computation: Finite & Infinite Machines", PHI.
4. Mishra & Chander Shekhar "Theory of Computer Science (Automate, Language & Computations), PHI



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Data Warehousing and Mining

Semester -IV

UNIT-I

Data ware housing Definition, usage and trends, DBMS vs. data warehouse, Data marts, Metadata Data mining definition & application, DBMS vs. data mining, KDD versus data mining, data mining techniques, Data Preprocessing: need, data cleaning, integration & Transformation.

UNIT-II

Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations, Data warehouse process & architecture, OLTP vs. OLAP, types of OLAP, ROLAP vs. MOLAP, 3 – Tier data warehouse architecture.

UNIT-III

Association Rule Mining, Single-Dimensional Boolean Association Rules Apriori algorithm, FP growth, Multi-Level Association Rules from Transaction Databases

UNIT-IV

Classification and Prediction, Concepts of Decision Tree Induction and Bayesian Classification
Cluster Analysis, Categorization of methods, Partitioning methods, K-Means algorithm, Outlier Analysis ,Hierarchical methods.

UNIT-V

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, Web Mining concepts

BOOKS:

1. *DATA MINING – CONCEPTS & TECHNIQUES; JIAWEI HAN & MICHELINE KAMBER – ELSEVIER*
2. *DATA WAREHOUSING FUNDAMENTALS; PAULRAJ PONNIAH, WILEY*
3. *DATA MINING TECHNIQUES; ARUN PUJAR; 2001, UNIVERSITY PRESS; HYDERBAD.*
4. *INTRODUCTION TO DATA MINING WITH CASE STUDIES; G.K. GUPTA, PHI*



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

Web Designing & Web Technology

UNIT – I

Client sever Computing Concepts, Distributed computing on the Internet, Introduction to Web Pages, HTML, HTML Elements and pages, Formatting text & pages, including picture in a page, creating tables and lists, splitting pages into frames. HTML 5.

UNIT – II

Site Design and Navigation : The home page Navigational tools. Formatting the body section using block level, using text level. Using font style, using phrase elements.

UNIT – III

Multimedia with Web : Creating files, streaming audio, streaming animations, java Script and Browser, Java Script and sever, Embedding Java Script & HTML, Java Script fundamentals Variables, Value Store house, statements, loops, condition and functions, objects properties and methods. Event handlers and non script tag.

UNIT IV

Comparison of HTML, DHTML and XML web casting, Domain name selection , web sever selection, Web hosting, uploading and downloading of web, incremental uploading of data, introduction to SQL Sever, Introduction to user management in SQL – Server.

UNIT – V

Introduction to ASP, database handling with ASP, Connection object, record set object, request object, response object, cookies, creating tables and insert query through connection .

BOOKS:

1. *HTML Black Book – Steven Holzner – Dreamtech Press*
2. *Mastering ASP Programming – BPB Publication*
3. *Java Script, Don Gosselin, Thomson Learning (Vikas Publication)*
4. *Principles of web Design Jeol Sklar, Thomson Learning (Vikas Publication)*
5. *Internet and Web technologies, TMH, 2002*

