MCA- 501 – CLOUD COMPUTING

UNIT-I

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (Iaas, Paas & saas).

UNIT-III

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

UNIT-IV

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I , Network security – II, Host security, Disaster recovery and management, Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V

Cloud Solutions: - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds.
Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services, Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

TEXT BOOKS:
1. George Reese – Cloud Application Architectures: Building Applications and Infrastructures in the cloud – O'Reilly Media Inc., 2009
2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter – Cloud Computing A practical Approach – McGraw Hill, 2010

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridge University Press, 2010

MCA- 502 – DATA WAREHOUSING & MINING

UNIT–I

Introduction to Data warehouse, Need for data warehousing, Data warehousing Components, Data Mart, Data Warehouse Architecture, Data Extraction, Cleanup, and Transformation Tools –Metadata repository and management, Discretization and Concept Hierarchy Generation, Major Issues in Data Mining, Star ,Snowflake and Galaxy Schemas for Multidimensional databases

UNIT–II

Data Preprocessing, Data Integration and Transformation, Data Reduction, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning, Discretization and Concept Hierarchy Generation, Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining,

UNIT–III

Introduction of Web Structure Mining, Web Usage Mining, Spatial Mining, Text Mining, Security Issue, Privacy Issue, Ethical Issue, Reporting and Query tools and Applications, Tool Categories, The Need for Applications, Online Analytical Processing (OLAP) Need Multidimensional Data Model, OLAP Guidelines, Multidimensional versus Multi relational OLAP, Categories of Tools ,OLAP Tools and the Internet.

UNIT–IV

Data mining algorithms Association rules, Association Rule Mining, Single Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, Fp Growth Algorithm, Time series mining association rules, latest trends in association rules mining.

UNIT–V

Clustering, Basic issues in clustering, Types of Clustering, First conceptual clustering system, Partitioning methods: k-means, expectation maximization (EM), Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Categorization of methods, Partitioning methods, Outlier Analysis.

REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay ", Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006

MCA- 503 –NETWORK SECURITY

UNIT-I
Classical Encryption Techniques: Symantec Cipher model, substitution Techniques, transposition techniques, Steganography.
Block Ciphers and the Data Encryption standards: Simplified DES, block cipher principles, the data Encryption standard, the strength of DES, differential and linear cryptanalysis, block cipher design Principles block cipher modes of operation.
Confidentiality using symmetric encryption: Placement of Encryption function, traffic confidentiality, key distribution, and random number generation.

UNIT-II
Public key Encryption and Hash functions: Prime numbers, Euler's Theorems,
Public key cryptography and RSA: Principles of Public key cryptosystems, the RSA algorithm.
Key Management other public key cryptosystems: Key management, diffie-Hallman key exchange, Elliptic curve arithmetic and elliptic curve cryptography.

UNIT-III
Message authentication and Hash function: Authentication Requirements, Authentication functions, Message authentication codes, hash functions, security of hash function and MACs.
Hash Algorithms: MD5 message digest algorithm, secure Hash algorithm, HMAC.
Digital Signature and Authentication protocols: Digital signatures, Authentication protocols, and digital Signature standard, **Authentication Applications**: Kerberos, X.509 Authentication service.

UNIT-IV
Electronic Mail Security: Pretty Good privacy, S/MIME.
IP Security: IP Security overview, IP security architecture, authentication header, encapsulating security payload, combining security associations, key management.
Web Security: Web security considerations, secure sockets layer and transport layer security, secure electronic transaction.

UNIT-V

Part four system security: Intruders, intrusion detection, and password
Management Malicious software: Viruses and related threats, virus Counter measures.
Firewalls: Firewall Design Principles, functionality, Polices and Access Control, Packet filters, Application level gateway, Encrypted tunnel, Security architecture,

BOOKS
1. William Stallings "Cryptography and Network Security", 3 ed, Pearson Education.
2. W. Stallings "Network security Essential "Applications & Standards", Pearson ed.
3. Kanfren "Network Security: Private Communications in a public world 2/e
4. Eric Maiwald "Network Security: A Preginner's Guide, second ed.", Tata Mcgraw Hill.
5. Roberta Bragg " Mark Rhodes, Ousley & Keith Strassberg Network Secirity : The Complete Reference " Tata McGraw Hill.

MCA- 504 –COMPILER DESIGN (A)

UNIT-I

Introduction of Compiler: -Analysis of the source program, Phases of a compiler, Cousins of the Compiler, Grouping of Phases, Compiler construction tools, Lexical Analysis, Role of Lexical Analyzer, Input Buffering, Specification of Tokens.

UNIT-II

Syntax Analysis & Syntax Directed Translation Syntax analysis:- CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR, LALR, LR), Parser generation. Syntax directed definitions: Construction of Syntax trees, Bottom up evaluation of S-attributed definition, L-attribute definition, Top down translation, Bottom Up evaluation of inherited attributes Recursive Evaluation, Analysis of Syntax directed definition.

UNIT-III

Type Checking & Run Time Environment Type checking:- type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions, Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation , Symbol table

UNIT–IV

Code Generation : -Intermediate code generation, Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation, Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code from DAG.

UNIT–V

Code Optimization: -Introduction to Code optimization, sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations, Data flow analysis of structure flow graph, Symbolic debugging of optimized code.

REFERENCE BOOKS:

1.   Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", PearsonEducation,Asia2003.
2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
4. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.

MCA- 504 –DOT NET TECHNOLOGY (B)

UNIT-I
Basic .NET Programming using C#, Introduction to .NET technologies, Structure of a C# Program, Data Types, Basic Control Structures, Introduction to classes and objects, Arrays, Introduction to Visual Studio .NET, Introduction to debugging, Classes and Objects, this keyword, Static Properties and Indexer, Inheritance, Overloading (Compile Time Polymorphism), Overriding and Runtime Polymorphism System, Object Boxing and Unboxing, Typecasting, Memory Management, Exception Handling.

UNIT-II
Visual Basic fundamentals:- The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.
Classes and Objects: - Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure.

UNIT-III
Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns, Adapters and Delegates and Events Data Processing and I/Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

UNIT-IV
Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: - All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events.

UNIT-V
Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader. Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

REFERENCES:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in VB; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

MCA- 505 – DISTRIBUTED SYSTEM (A)

UNIT-I

Introduction to Distributed Systems:- Introduction, Examples of distributed Systems, Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System.

UNIT-II

Distributed Share Memory And Distributed File System:- Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Structure of Share Memory Space, Consistency model, Desirable features of good Distributed File System , File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File application.

UNIT-III
Distributed Objects and Remote Invocation: - Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.
Security: - Overview of security techniques, Distributed File Systems, File service architecture, Sun Network File System, The Andrew File System.

UNIT-IV

Distributed Multimedia & Database System: - Distributed Data Base Management System (DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements.

UNIT-V

Distributed Transactions: - Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication, System model and group communication, Fault-tolerant services, Transactions with replicated data.

REFERENCES:

- Sinha, Distributed Operating System Concept & Design, PHI
- Coulouris & Dollimore, Distributed System Concepts and Design, Pearson Pub
- Singhal & Shivratari, Advance Concept in Operating System, McGraw Hill
- Attiya & Welch, Distributed Computing, Wiley Pub.

MCA- 505 – INFORMATION STORAGE & MANAGEMENT (B)

UNIT-I

Introduction: - Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Data creation and The value of data to a business, Information Lifecycle Management, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Center infrastructure, Data categorization.

UNIT-II

Storage Systems Architecture:- Intelligent disk subsystems overview, Contrast of integrated vs modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

UNIT-III

Introduction To Networked Storage: - Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, IP-SAN, Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Introduction to Information Availability: - Business Continuity and Disaster Recovery Basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles & techniques.

UNIT-IV

Managing & Monitoring: - Management philosophies (holistic vs. system & component), Industry management standards (SNMP, SMI-S, CIM), Standard framework applications, Key management, Metric analysis methodologies & trend analysis, Reactive and pro-active management best practices, Provisioning & configuration change planning, Problem reporting, prioritization, and handling techniques, Management tools overview.

UNIT-V

Securing Storage and Storage Virtualization: - Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

REFERENCE BOOKS:

1. EMC Corporation, Information Storage and Management, Wiley, India.
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill , Osborne, 2003.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill ,Osborne, 2001.
4. Additional resource material on www.emc.com/resource-library/resource-library.esp

<u>MCA- 507 –PROGRAMMING LAB IN CLOUD COMPUTING</u>

<u>LIST OF EXPERIMENTS:-</u>

1. To demonstrate practically all the services of the cloud.

2. How to develop and deploy our application on cloud using selesforce.com

3. Software study- Hadoop and HDFS.

4. Service deployment and using over cloud.

5. Managing exiting computing resources.

6. Using existing cloud Characteristic and service models.

7. Installation and configuration of oracle virtual bnox for windows XP and android.

8. Installation Configuration of Hadoop.

9. Using Hadoop for counting word frequency with map reduces.

10. Cloud security Management.