

### **MCSE 301 (A) – Data Warehousing & Mining**

Introduction : Data Mining: Definitions, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas.

Association Rules & Clustering Techniques: Introduction, Various association algorithms like A Priori, Partition, Pincer search etc., Generalized association rules. Clustering paradigms; Partitioning algorithms like K-Medoid, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; categorical clustering algorithms, STIRR, ROCK, CACTUS.

Other DM techniques & Web Mining: Application of Neural Network, AI, Fuzzy logic and Genetic algorithm, Decision tree in DM. Web Mining, Web content mining, Web structure Mining, Web Usage Mining.

Temporal and spatial DM: Temporal association rules, Sequence Mining, GSP, SPADE, SPIRIT, and WUM algorithms, Episode Discovery, Event prediction, Time series analysis.

Spatial Mining, Spatial Mining tasks, Spatial clustering, Spatial Trends.

Data Mining of Image and Video : A case study. Image and Video representation techniques, feature extraction, motion analysis, content based image and video retrieval, clustering and association paradigm, knowledge discovery.

#### **Reference Books :**

1. Data Mining Techniques ; Arun K.Pujari ; University Press.
2. Data Mining; Adriaans & Zantinge; Pearson education.
3. Mastering Data Mining; Berry Linoff; Wiley.
4. Data Mining; Dunham; Pearson education.
5. Text Mining Applications, Konchandy, Cengage

## **MCSE 302 (A) – Network Security**

### Conventional Encryption

Conventional Encryption : Conventional Encryption Model , Steganography , Classical Encryption Techniques, 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, Conventional Encryption algorithms

### Public Key Encryption And Hash Functions

Public Key Cryptography , Principles of Public Key Cryptosystems , The RSA Algorithm , Key Management , Diffie Hellman Key Exchange , Elliptic Curve Cryptography

### Message Authentication and Hash Functions

Authentication Requirements, Authentication Functions, Message Authentication Codes , Hash Functions , Security of Hash Functions

### Hash And Mac Algorithms

MD5 Message Digest Algorithm , Secure Hash Algorithm (SHA-I) , RIPEMD , HMAC

### Digital Signatures and Authentication Protocols

Digital Signatures , Authentication Protocols -Digital Signature Standard

### Authentication Applications , IP Security , Web Security

### Intruders, Viruses and Worms

Intruders , Viruses and Related Threats

### Firewalls

Firewall Design Principles , Trusted Systems

### **Reference Books :**

1. William Stallings, “ Cryptography and Network Security”, Second edition, Prentice Hall, 1999.
2. Atul Kahate, “ Cryptography and Network Security,” TMH
3. William Stallings, "Cryptography and Network Security", Third Edition, Pearson Ed
4. Introduction to network security, Krawetz, Cengage

### **MCSE- 302 (B) Simulation and Modeling**

Introduction to modeling and simulation: Modeling and simulation methodology, system modeling , concept of simulation, continuous and discrete time simulation.

Basic concept of probability and random variables continuous and discrete random variables, distribution of random variables: discrete and continuous, Compartmental models: linear, nonlinear and stochastic models.

Introduction to Queuing Theory: Characteristics of queuing system, Poisson's formula, birth-death system, equilibrium of queuing system, analysis of M/M/1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.

System Dynamics modeling: Identification of problem situation , preparation of causal loop diagrams and flow diagrams, equation writing, level and rate relationship. Simulation of system dynamics models.

Verification and validation: Design of simulation experiments, validation of experimental models, testing and analysis. Simulation languages comparison and selection, study of Simulation sw -SIMULA, DYNAMO, STELLA, POWERSIM.

#### **Reference Books :**

1. Gordon G., System simulation, Printice Hall.
2. Payer T., Introduction to system simulation, McGraw Hill.
3. Seila, Applied Simulation Modeling, Cengage
4. Spriet, Computer Aided Modeling and Simulation, W.I.A.
5. Sushil, System Dynamics, Wiley Eastern Ltd. 23
6. Shannon R.E., System simulation, Prentice Hall