



MTIT101 ADVANCED COMPUTER NETWORKING

UNIT 1

Review of Networking and O.S. fundamentals, ISO-OSI Model, different layers and their functions, LAN, MAN, WAN, Communication media & principles IEEE standards etc.

UNIT 2

Internetworking with TCP/IP, Basic concepts, Principles, Protocols and Architecture, Address handling Internet protocols and protocol layering. DNS, Applications: TEL- NET, RLOGN , FTP, TFTP, NFS, SMTP, POPL, IMAP, MIME, HTTP,STTP,DHCP, VOIP, SNMP.

UNIT 3

Introduction to Router, Configuring a Router, Interior & Exterior Routing, RIP, Distance Vector Routing, OSPF, BGP, Uni-cast, Multicast and Broadcast. Multicast routing protocols: DVMRP, MOSPF, CBT, PIM, MBONE, EIGRP, CIDR, Multicast Trees, Comparative study of IPv6 and IPv4.

UNIT 4

VPN addressing and routing, VPN Host management, ATM Concepts, Services Architecture, Equipments and Implementation

UNIT 5

Introduction to wireless transmission and medium access control, wireless LAN: IEEE 802.11, Hiper LAN , Bluetooth Mobile Network and Transport layer, WAP GSM and CDMA: Network architecture and management

Reference Books:

- Computer Networks: Tanenbaum.
- Internetworking with TCP/IP: Comer.
- Data Communications, Computer Networks and Open Systems: Hallsall.
- Data Communications, Stalling.
- Mobile Communication: Schiller, Pearson Education
- Computer Communications and network Technology, Gallo, Cengage (Thomson)
- Wireless and Mobile Network Architecture: Yi Bing Lin, Wiley
- ATM Network: Kasara, TMH



MTIT - 102 COMPUTER GRAPHICS & MULTIMEDIA

Unit 1

Basics of Computer Graphics, Graphics display devices, Input devices; Raster Graphics: line and circle drawing algorithms Windowing and clipping: Cohen and Sutherland line clipping. Cyrus beck clipping method.

Unit 2

Computations on polygons: point inclusion problem, polygon filling, polygon intersection, clipping. 2D and 3D Geometrical Transformations: scaling, translation, rotation, reflection.

Unit 3

Viewing Transformations, parallel and perspective projection, curves and Surfaces: cubic splines, Bezier curves B-splines, Hidden line/surface removal methods; Rendering & Visualization, Illuminations model. Shading: Gouraud, Phong. Introduction to Raytracing.

Unit 4

Multimedia Components, Multimedia system designs an introduction compression & decompression data & file format standard. Multimedia input/output technologies.

Storage technologies, Multimedia authoring & user interface. Hyper media messaging. Distributed multimedia system

Reference Books:

1. Rogers D.F. Procedural Elements of Computer Graphics, McGraw Hill.
2. Hearn and Baker. Computer Graphics, Prentice-Hall of India, New Delhi
3. Foley, VanDam, Fundamentals of Interactive Computer Graphics, Addison-Wesley
4. Multimedia System Design- Prabhat K. andleigh and Kiran Thakrar, PHI
5. Shuman, Multimedia in action, Cengage (Thomson)



MCIT - 103 Information Security System

Unit 1

Introduction: Basic objectives of cryptography, secret-key and public-key cryptography, one-way and trapdoor one-way functions, cryptanalysis, attack models, classical cryptography. Block ciphers: Modes of operation, DES and its variants, RC , IDEA, SAFER, FEAL, BlowFish, AES, linear and differential cryptanalysis. Stream ciphers: Stream ciphers based on linear feedback shift registers, SEAL, unconditional security.

Unit 2

Message digest: Properties of hash functions, MD2, MD5 and SHA-1, keyed hash functions, attacks on hash functions. Public-key parameters: Modular arithmetic, gcd, primality testing, Chinese remainder theorem, modular square roots, finite fields.

Unit 3

Intractable problems: Integer factorization problem, RSA problem, modular square root problem, discrete logarithm problem, Diffie-Hellman problem, known algorithms for solving the intractable problems.

Unit 4

Public-key encryption: RSA, Rabin and ElGamal schemes, side channel attacks. Key exchange: Diffie-Hellman and MQV algorithms. Digital signatures: RSA, DAS and NR signature schemes, blind and undeniable signatures. Entity authentication: Passwords, challenge-response algorithms, zero-knowledge protocols. Standards: IEEE, RSA and I O standards

Unit 5

Network issues: Certification, public-key infrastructure (PKI), secured socket layer (SSL), Kerberos. Advanced topics: Elliptic and hyper-elliptic curve cryptography, number field sieve, lattices and their applications in cryptography, hidden monomial cryptosystems, cryptographically secure random number generators.

Reference Books:

1. William Stallings, Cryptography and Network Security, PHI
2. Atul Kahate, “Cryptography and Network Security”, TMH
3. Calabrese, Info security intelligence-cryptography principles appl., Cengage Learn
4. Krawetz, Intro to network security, Cengage Learning.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

MCIT - 104 - ADVANCE DBMS

Unit 1

DBMS Concepts Introduction, Data models, Entities and attributes, Relationships, E-R diagram. Relational Data models: Domains, Tuples, Attributes, Keys, Relational database, Schemas, Integrity constraints. Relational algebra and relational calculus, Normalization, Normal forms.

Unit 2

Query Processing and Optimization. Distributed databases: Fragmentation, Replication, Location & Fragment transparency, Distributed Query Processing and Optimization.

Unit 3

Object oriented and object relational databases: Specialization, Generalization, Aggregation,

Unit 4

Association. Introduction to Image and Multimedia databases and data structures. Data structure- R tree, K d tree, Quad trees, Content based retrieval: Color Histograms.

Unit 5

Web databases: Accessing databases through web

Reference Books:

1. R. Elmasri, S. Navathe, Fundamentals of Database System, Benjamin Cummings
2. C.J. Date, An Introduction to Data base Systems, Volume I, Addison Wesley
3. H. F. Korth and A. Silberschatz. Database Concept, TMH
4. Object Oriented databases :Narang, Prentice-Hall of India, New Delhi
5. Rob, Database Systems, Cengage, (Thomson)
6. Pratt, Concepts of DBMS, Cengage.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

MCIT - 105A INTERNET TECHNOLOGY

Unit 1 Protocols and architecture, Protocols, Characteristics, Functions, Need for multiple protocols, Conceptual layers of multiple protocol software, Protocol layering principles, Multiplexing and Demultiplexing.

Unit 2 Internet Protocol, Virtual network, Internet architecture and philosophy, Purpose of the internet protocol, Internet diagram, Routing in an internet, table driven IP internet, IP routing algorithm, Internet control message protocols (ICMP), Internet protocol version 6, Features, Format, Source routing, Options, address space assignment, User data gram protocol, Format of UDP messages, UDP encapsulation and protocol layering. Transmission control protocol, Need for stream delivery, Properties of reliable delivery service, Ports, Connections and pins, Window size and flow control - TCP segment format, Acknowledgement, Timeouts, Robustness, Establishing and clearing TCP connects.

Unit 3 Route discovery protocols, Core, peers, Gateway to gating algorithm (GGP), Routing, Autonomous system concepts, Exterior gateway protocol, Routing information protocol (RIP), The Hello protocol, Open shortest path first protocol (OSPF). Application layer protocols, TELNET protocols, File transfer protocols (FTP), Simple mail transfer protocol (SMTP), X-Window system protocol, Remote procedure call, Network file system, proof to point protocol.

Unit 4 General structure of a network management product, Information extraction and collection instruments, Monitoring principles, Instruments supporting physical network management, Line monitors, Data scopes, network monitors, Instruments supporting logical network management, Accounting packages, Application monitoring, Communication monitors, Security monitors, LAN monitors.

Configuration management, Configuration management functions, Inventory managements, Network topology services, Order processing and provisioning, Charge management directory services.

Unit 5 Fault management, Processes and procedure, Fault management functions, Performance management, Security management, accuracy management, Network capacity planning.

Reference Books:

1. Uyles Black, TCP/IP and related protocols, McGraw Hill.
2. Udupa, Network Management System Essentials, McGraw Hill.
3. DE. Comer, Internetworking with TCP/IP Vol. I, Principles, Protocol, Arch., PHI
4. Kernel Terplan, Communication Network management, PHI
5. TCP/IP Protocol Suite, Forouzan, TMH



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

MCIT – 105B Data Mining and Warehousing

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-Method, 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.

The vicious cycle of Data mining, data mining methodology, measuring the effectiveness of data mining data mining techniques. Market baskets analysis, memory based reasoning, automatic cluster detection, link analysis, artificial neural networks, generic algorithms, data mining and corporate data warehouse, OLAP

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



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

MCIT 105C Software Testing & Quality Assurance

Introduction to software testing, concepts, issues and techniques, test activities, management and automation, Coverage and usage testing based on checklist, input domain portioning and boundary testing, object oriented testing: testing OOA and OOD models, object oriented testing strategies, test case design for OO software, testing methods applicable at the class level, interclass test case design, Web application testing, debugging, security & reliability.

Programming style and program quality: simple style rules, comment statements, program quality, quantifying program quality, Software quality and quality Assurance: Principle of Software Quality Assurance (SQA), Applying SQA to software project, proven factors for SQA success, SQA during software requirements, SQA during software design phase, SQA during software code and test, Advance quality engineering topics.

Human factors in software engineering: Human factors history, HCL requirements and design process, HCL testing.

Reference Books:

1. Ali Behforooz and Frederick J. Hudson, Software Engineering Fundamentals, Oxford University Press
2. JeffTain, Software Quality Engineering: Testing, Quality Assurance and Quantifiable improvement, Willy Pub.
3. Aditya Mathur, Foundation of Software Testing 1/e, Pearson Education
4. Paul C. Jorgensen, Software Testing, A Craftsman's Approach, Second Edition, CRC Press