



**MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR – 474005**  
(A Govt. Aided UGC Autonomous Institute Affiliated to R.G.P.V. Bhopal, M.P.)

**ANNEXURE – 2**

*Syllabi*  
*of*  
*Departmental Elective (DE) Courses*  
***B.Tech VII Semester***  
***(Computer Science & Engineering)***  
*Under Flexible Curriculum*  
***[ITEM-1]***



Department of Computer Science and Engineering

**NETWORKING WITH TCP/IP**  
**150711 (DE-3)**

**COURSE OBJECTIVES**

- To build an understanding of the fundamental concepts of TCP/IP with computer networking.
  - To familiarize the student with the basic taxonomy and terminology of the TCP/IP area.
  - To understand the network traffic, congestion, controlling and resource allocation.
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**Unit-I**

**Introduction :** ARPANET, ISDN and Broadband ISDN, Protocols and Standards, Internet Administration , ATM Model, SONET & SDH, TCP/IP Protocol Suite, Network Addressing at various layer

**Unit-II**

**IP Layer:** Connection Oriented & Connection less Internet Working, IPV4 Addressing, Subnetting, Supernetting. Delivery and Forwarding of IP Packets, IPv4,IPV6, ARP, RARP, ICMPv4, IGMP, Mobile IP, Unicast Routing Protocols (RIP, OSPF, and BGP), Multicasting and Multicast Routing Protocols.

**Unit-III**

**TCP and UDP Layer:** TCP Reliable data transfer, Connection Establishment & Release, TCP Frame, Header Checksum, Sliding Window Concept for error control, congestion control and TCP timer, UDP Format, Pseudo header, Encapsulation, Checksum, Multiplexing & Demultiplexing. Stream Control Transmission Protocol.

**Unit- IV**

**Application Layer:** Client-Server Paradigm, DHCP, DNS, TELNET, FTP, TFTP, World Wide Web and HTTP, Electronic Mail: SMTP, POP, IMAP, and MIME, SNMP, BOOTP.

**Unit-V**

**Multimedia and Next Generation Protocol:** Voice over IP, Real Time Transport Protocol, IPv6 Addressing, IPv6 Protocol, ICMPv6, Firewall, PGP, HTTPS.



### **RECOMMENDED BOOKS**

- Data and Computer Communication, W. Stalling, Pearson
  - Internetworking with TCP/IP - Vol. – I, D.E. Comer, PHI
  - Data Communication & Networking, B.A. Forouzan
  - ISDN and Broad band ISDN with Frame Relay & ATM, W. Stalling
  - LANs, Keiser
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### **COURSE OUTCOMES**

After completion of this course, the students would be able to:

- CO1. define the concept of computer network and various layered architecture.
  - CO2. compare the classless and class full addressing of IPV4 .
  - CO3. identify the different types of networking devices and their functions within a network.
  - CO4. analyze various protocols of computer networks for assisting network design and implementation.
  - CO5. design client server applications and communication model and protocols for communication.
  - CO6. elaborate various TCP/IP protocol for achieving multimedia and security services.
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Department of Computer Science and Engineering

**DATA MINING & WAREHOUSING**  
**150712 (DE-3)**

**COURSE OBJECTIVES**

- To understand the value of data mining in solving real-world problems.
  - To gain understanding of algorithms commonly used in data mining tools.
  - To develop ability for applying data mining tools to real-world problems.
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**Unit - I**

**Introduction:** Motivation, important, Data type for Data Mining: Relational Databases, Data Ware-Houses. Transactional Databases, Advanced Database System and Its Applications, Data Mining Functionalities Concept/Class Description, Association Analysis Classification & Prediction, Cluster Analysis, Outliner Analysis Classification of Data Mining Systems, Major Issues in Data Mining.

**Unit - II**

**Data Warehouse and OLTP Technology for Data Mining:** Differences between Operational Database Systems & Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology, Emerging Scenario of Pattern Warehousing System.

**Unit - III**

**Data Pre-processing:** Data Cleaning, Data Integration and Transformation, Data Reduction Discretization and Concept Hierarchy Generation. Data Mining Primitives Languages and System Architectures, Concept Description, Characterization and Comparison Analytical Characterization.

**Unit - IV**

**Mining Association Rules in Large Databases:** Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single Dimensional Boolean Association Rules from Transactional Databases: The Apriori Algorithm, Generating Association Rules from Frequent Items, Improving the Efficiency of Apriori, other Algorithms &



their Comparison, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint Based Association Rule Mining.

### **Unit - V**

**Classification & Predication and Cluster Analysis:** Issues Regarding Classification & Predication, Different Classification Methods, Predication, Cluster Analysis, Major Clustering Methods, Currently Available Tools, Case Study.

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### **RECOMMENDED BOOKS**

- Data Mining: Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications.
  - Data Mining Techniques, A. K. Pujari, Universities Press Pvt. Ltd.
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### **COURSE OUTCOMES**

After completion of this course, the students would be able to:

CO1. classify various databases systems and data models of data warehouse.

CO2. compare various methods for storing & retrieving data from different data sources/repository.

CO3. apply pre-processing techniques for construction of data warehouse.

CO4. analyse data mining for knowledge discovery & prediction.

CO5. explain data mining methods for identification of association for transactional databases.

CO6. develop various classification and clustering algorithms for data using data mining.

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Department of Computer Science and Engineering

**DISTRIBUTED SYSTEMS**  
**150713 (DE-3)**

**COURSE OBJECTIVES**

- To provide students contemporary knowledge of distributed systems.
  - To equip students with skills to analyze and design distributed applications.
  - To gain experience in the design and testing of a large software system, and to be able to communicate that design to others.
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**Unit - I**

**Introduction to 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:** Basic Concept of Distributed Share Memory (DSM), DSM Architecture & Its Types, Design & Implementations Issues in DSM System, Structure of Share Memory Space, Consistency Model and Thrashing.

**Unit - III**

**Distributed File System:** Desirable Features of Good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault Tolerance.

**Unit - IV**

**Inter Process Communication and Synchronization:** Data Representation & Marshaling, Group Communication, Client Server Communication, RPC-Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms - Bully & Ring Algorithms.



## Unit - V

**Distributed Scheduling and Deadlock** Distributed Scheduling- Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock- Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms. Case Study of Distributed System: Amoeba, Mach, Chorus.

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## RECOMMENDED BOOKS

- Distributed Operating System Concept & Design, Sinha, PHI .
  - Distributed System Concepts and Design, Coulouris & Dollimore, Pearson Pub.
  - Distributed Operating System, Andrew S. Tanenbaum, Pearson.
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## COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO1. Tell the basic elements and concepts related to distributed system technologies
  - CO2. Demonstrate knowledge of the core architectural aspects of distributed systems.
  - CO3. Identify how the resources in a distributed system are managed by algorithm.
  - CO4. Examine the concept of distributed file system and distributed shared memory.
  - CO5. Compare various distributed system algorithms for solving real world problems.
  - CO6. Develop application for achieving various services of distributed system
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