

COURSE TITLE: DATA COMMUNICATION AND NETWORKING**COURSE OBJECTIVES:**

- To help students to get a grounding of network components and architecture.
- To explore networking models.
- To learn the way protocols are used in networks and their design issues.

LEARNING OUTCOMES:

The students will be able to:

- Comprehend the basic concepts of computer networks and data communication systems.
- Analyse basic networking protocols and their use in network design
- Explore various advanced networking concepts.

Code	Course	Teaching Period / Week		Credit			Duration of Theory Exam (in Hrs.)
		L	Pr./ Tu	Int.	Ext.	Total	
MCS102	Data Communication and Networking	4	-	2	2	4	2

Module No.	Objective	Content	Evaluation
1	To introduce to basic concepts of networking	Introduction to Networking Internet and Intranet, Protocol layer and their services, Network Applications like Web, HTTP, FTP and Electronic Mail in the Internet, Domain Name System, Transport-Layer Services, Multiplexing and Demultiplexing, UDP, TCP, TCP Congestion Control, Network Layer, Virtual Circuit and Datagram Networks, Need of Router, The Internet Protocol (IP), Routing Algorithms, Routing in the Internet.	Students will be evaluated by taking viva. (Marks 05)
2	To elaborate network virtualization	Network Virtualization Need for Virtualization, The Virtual Enterprise, Transport Virtualization-VNs, Central Services Access: Virtual Network Perimeter, A Virtualization Technologies primer: theory, Network Device Virtualization, Data-Path Virtualization, Control-Plane Virtualization, Routing Protocols.	Written Unit Test – I (Marks 25)
3	To elaborate the concept of Adhoc networking	Adhoc Networking Introduction, application of MANET, challenges, Routing in Ad hoc networks, topology & position-based approaches, Routing protocols: topology based, position based, Broadcasting, Multicasting, & Geocasting,	Written Class Test will be conducted. (Marks 10)

		Wireless LAN, Transmission techniques, MAC protocol issues, Wireless PANs, The Bluetooth technology.	
4	To elaborate wireless sensor networks	Wireless sensor networks Need and application of sensor networks, sensor networks design considerations, empirical energy consumption, sensing and communication range, design issues, localization scheme, clustering of SNs, Routing layer, Sensor networks in controlled environment and actuators, regularly placed sensors, network issues, RFID as passive sensors.	Assignments will be given for the above topics. (Marks 10)

EVALUATION:

Evaluation	Details	Marks
(* please give details of assessment in terms of Unit test/ Project/ quiz /or other assignments and marks allotted for it)		
Internal	<ul style="list-style-type: none"> • Unit test • Viva • Class Test • Assignments 	50 Marks
External	Final Examination	50 Marks
Total marks		100 Marks

TEXT BOOKS:

1. James F. Kurose, Keith W. Ross, Pearson (2012), *Computer Networking: A Top-Down Approach* 6th edition, Pearson
2. Victor Moreno, Kumar Reddy, (2006), *Network Virtualization*, Cisco Press.
3. Carlos de Moraes Cordeiro, Dharma Prakash Agrawal, (2011), *Ad Hoc and Sensor Networks: Theory and Applications*, World Scientific Publishing Company; 2nd edition

REFERENCE BOOKS:

1. Behrouz Forouzan, (2009), *TCP/IP Protocol Suite* 4 edition, McGraw-Hill Science
2. Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, (2011), *Mobile Ad Hoc Networks: Current Status and Future Trends*, CRC Press
3. S. Jochen Schiller, (2012), *Mobile Communications*, Second Edition, Pearson Education
4. William Stallings, (2013), *Wireless Communications and Networks*, Pearson Education
5. Vijay Garg, (2002), *Wireless network evolution: 2G to 3G*, Prentice Hall
6. Ivan Stojmenovic, (2010), *Handbook of Wireless Networks and Mobile Computing*, Wiley India Edition