

Computer Networking

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| Semester IV | Subject Code: BC41603 | Lectures: 60 |
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Objectives:

The course is designed to equip students with,

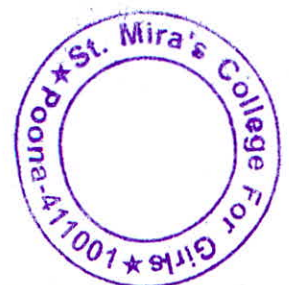
- An ability to understand of modern network architectures from a design and performance perspective
- The major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
- The knowledge of network terminology
- The areas of Network Security

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| Unit 1: Basics of Computer Networks | 10 |
| <ul style="list-style-type: none"> • Computer Network <ul style="list-style-type: none"> ➤ Definition ➤ Goals ➤ Applications ➤ Structure ➤ Components • Topology <ul style="list-style-type: none"> ➤ Bus ➤ Star ➤ Ring ➤ Mesh • Types of Networks <ul style="list-style-type: none"> ➤ LAN, MAN, WAN, Internet ➤ Broadcast & Point-To-Point Networks • Communication Types <ul style="list-style-type: none"> ➤ Serial ➤ Parallel • Modes of Communication : <ul style="list-style-type: none"> ➤ Simplex ➤ Half Duplex ➤ Full Duplex ➤ Server Based LANs & Peer-to-Peer LANs • Case Study | |



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| Unit 2: Network Models | 8 |
| <ul style="list-style-type: none"> ▪ Design issues of the layer ▪ Protocol Hierarchy ▪ ISO-OSI Reference Model : <ul style="list-style-type: none"> ➤ Layers in the OSI Model ➤ Functions of each layer ▪ Connection Oriented services ▪ Connectionless services ▪ Internet Model (TCP/IP) ▪ Comparison of ISO-OSI & TCP/IP Model ▪ Addressing <ul style="list-style-type: none"> ➤ Physical Addresses ➤ Logical Addresses ➤ Port Addresses ▪ IP Addressing <ul style="list-style-type: none"> ▪ Classful addressing ▪ Classless addressing ▪ Case study | |

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| Unit 3: Transmission Media | 10 |
| <ul style="list-style-type: none"> ▪ Guided Media(Wired) : <ul style="list-style-type: none"> ➤ Coaxial Cable:- Physical Structure, Standards, BNC Connector, Applications ➤ Twisted Pair :- Physical Structure, UTP vs STP, Connectors, Applications ➤ Fiber Optics Cable :- Physical Structure, Connectors, Applications ▪ Unguided Media(Wireless) <ul style="list-style-type: none"> ➤ Electromagnetic Spectrum For Wireless Communication ▪ Propagation Methods <ul style="list-style-type: none"> ➤ Ground, ➤ Sky, • Line-Of-Sight • Wireless Transmission • Radio Waves • Infra-Red, • Micro-Wave • Case study | |



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| Unit 4: Wired and Wireless LAN's | 10 |
| <ul style="list-style-type: none"> • IEEE Standards <ul style="list-style-type: none"> ➤ Standard Ethernet ➤ Fast Ethernet ➤ Gigabit Ethernet • Network Interface Cards(NIC) <ul style="list-style-type: none"> ➤ Components of NIC ➤ Functions of NIC ➤ Types of NIC • Wireless LAN <ul style="list-style-type: none"> ➤ IEEE802.11 Architecture ➤ MAC Sub layer <ul style="list-style-type: none"> ○ Frame Format ○ Frame Types • Bluetooth (Architecture, Pico net and Scatter net) • Case Study | |

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| Unit 5 :- Network Connectivity Devices | 10 |
| <ul style="list-style-type: none"> • Categories of Connectivity Devices <ul style="list-style-type: none"> ➤ Passive & Active Hubs ➤ Repeaters ➤ Bridges <ul style="list-style-type: none"> ➤ Transparent Bridges(Loop Problem, Spanning Tree) ➤ Source Routing Bridges ➤ Switches ➤ Router ➤ Gateways • Network Security Devices <ul style="list-style-type: none"> ➤ Firewalls <ul style="list-style-type: none"> ➤ Packet-Filter firewall ➤ Proxy firewall ➤ Proxy server <ul style="list-style-type: none"> ➤ Normal Proxy ➤ Transparent Proxy ➤ Reverse Proxy • Case study | |



***Contact hours – 12 hours**

Recommended Text Book:

- ✓ 1. *Computer Networking*, Vikas Tayade, Umakant Shrishetti, Nirali Prakashan, Nov.2014
- ✓ 2. *Computer Networking*, Alok Pawar, Tech-Max Publication, Dec.2014
- ✓ 3. *Computer Networking*, Dr.Ranjit Patil, Prof. Nandita Kulkarni, Success Publication 2014

Reference Books:

1. Andrew Tanenbum, *Computer Networks*, VI Edition
2. Behrouz Ferouzan, *Data Communication & Networking*, III Edition
3. Prakash Gupta, *Data Communication & Computer Networking* March 2008 PHI

