

Sri Sathya Sai College for Women, Bhopal

(An Autonomous College affiliated to Barkatullah University, Bhopal)

(NAAC Accredited 'A' Grade)



SYLLABUS

SESSION: 2023-24

PROGRAM: Degree

YEAR: III Year

CLASS: B.A./ B.Com.

COURSE TYPE: Generic Elective

COURSE TITLE: Computer Network Management

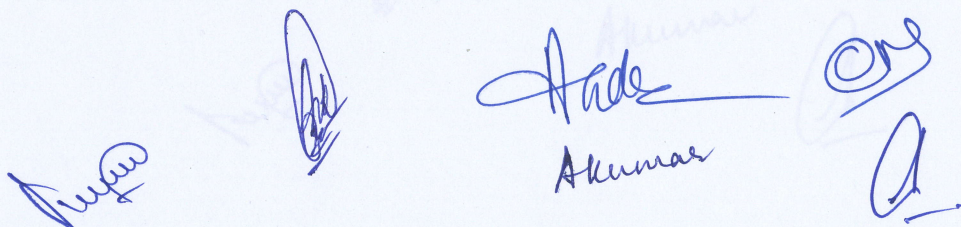
Sri Sathya Sai College for Women, Bhopal
(An Autonomous College Affiliated to Barkatullah University Bhopal)
Department of Higher Education, Govt. of M.P.
Under Graduate Syllabus (Annual Pattern)

As recommended by Central Board of Studies and approved by the Governor of M. P.
wef 2023-2024
(Session 2023-24)
(NEP-2020)

Class	B.A. / B.Com.
Year	III Year
Subject	Computer Science
Course Title	Computer Network Management
Course Type	Elective
Credit Value	4
Max. Mark	30+70 (Minimum Marks 35)
Course Outcome: On successful completion of this course , the students will be able to:	
<ul style="list-style-type: none"> • Understand concepts and terminology of Networking. • Understand structured Network cabling with Copper and Fiber. • Architect & Design a network as per requirement of site. • Manage and Troubleshoot faults in network using NMS and different tools. 	

Particular

Unit-I	<p>Introduction: Data Communications, Network Models, Protocols and Standards, Analog and Digital Signals, Transmission Modes, Transmission Impairment, Data Rate Limits, Performance, Digital Transmission, Network Architecture, Network Diagram, IP Schema.</p> <p>Network Devices & Drivers: Router, Modem, Repeater, Hub, Switch, Core Switch, Distribution Switch, Access Switch, Firewall, Unified Threat Management.</p> <p>Layers in OSI Model (fundamental concepts).</p>
Unit-II	<p>Signal Conversion: Digital-to-Digital Conversion, Analog-to-Digital Conversion, Digital-to-Analog Conversion, Analog-to-Analog Conversion.</p> <p>Transmission Media: Guided Media, Unguided Media, Usage of CAT 6 UTP Cable, Optical Fibre Cable, STP Cable, CAT 6A Cable.</p> <p>Switching Techniques: Packet Switching, Circuit Switching, Datagram Networks, Virtual-Circuit Networks (VLAN), Structure of a Switch & Structured Network Cabling, Subnetting, Wireless network, Wireless controller, AAA Server.</p>
Unit-III	<p>Types of Networks – LAN, PAN, WAN, MAN, CAN, POLAN, VPN, EPN, SAN, WLAN, Hybrid Access Network.</p> <p>Network Topologies – Star, Ring, Bus, Mesh, Hybrid, Client/Server Network, Peer to peer Network</p>



Unit-IV	Network Terminology – Ipv4, Ipv6, FTP, DHCP, MAC address, NOS, NAT, RIP, VPN, SMTP, ICMP, ARP, TCP/IP, UDP, SLIP, DNS, VPN, NMS
Unit-V	Network Architecture – Designing of Network, Usage of Network devices, Finding out the Quantity of Material for setting up a Network at a site, Cost effective and reliable Network creation. Fault diagnosis in network.
Unit-VI	Network Management Tools , Improving network performance, Industrial networks, Managing NMS, Network Troubleshooting through NMS, Best practice for network monitoring and management, Troubleshooting security for a networked system.

Suggestion Books:

- Mani Subramanian, Network Management Principles and Practice; 2nd Edition, Pearson Education.
- Morris Mano, Network Management, Pearson Education.
- Mark Burges, Principles of Network and System Administration, Wiley.

Suggestive digital platforms/ web links:

- <https://www.youtube.com/watch?v=qiQR5rTSshw>
- Free CCNA | Network Fundamentals - Day 1 (<https://www.youtube.com/watch?v=n2D1o-aM-2s>)
- Free CCNA | Network Devices <https://www.youtube.com/watch?v=H8W9oMNSuwo>
- Free CCNA | OSI Model & TCP/IP Suite (<https://www.youtube.com/watch?v=t-ai8JzhHuY>)
- Free CCNA | Interfaces and Cables | Day3 (<https://www.youtube.com/watch?v=ieTH5lVhNaY>)
- Free CCNA | Intro to the CLI | Day 4 (<https://www.youtube.com/watch?v=IYbtai7Nu2g>)
- Free CCNA | Ethernet LAN Switching (Part 1) | Day 5 (<https://www.youtube.com/watch?v=u2n762WG0Vo>)
- CCNA | Analyzing Ethernet Switching | Day 6 Lab (<https://www.youtube.com/watch?v=Iq0dSaOQDI8>)
- Free CCNA | IPv4 Addressing (Part 1) | Day7 (<https://www.youtube.com/watch?v=3ROdsfEUuhs>)
- Free CCNA | IPv6 Part 1 | Day 31 (<https://www.youtube.com/watch?v=ZNuXyOXae5U>)
- Free CCNA | IPv6 Part 3 | Day 33 (<https://www.youtube.com/watch?v=rwkHfsWQwy8>)

Suggested equivalent online courses:

- Demystifying Networking (04 weeks)
- Cyber Security (15 Weeks)
- <https://www.edx.org/learn/computer-networking>

Scheme of Marks:

Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 marks, Term End Exam: Theory 70 marks		
Internal Assessment : Continuous Comprehensive Evaluation (CCE):	Class Test Assignments/ Presentation	30
External Assessment: University Exam Section Time:03.00 Hours	Section (A) Very Short questions Section (B) Short questions Section (C) Long questions	70
		Total 100

Handwritten signatures and initials in blue ink:

- A circular stamp or signature in the center.
- A signature "Arde" with a horizontal line and "ans" written above it to the right.
- A signature "Alkumar" written below "Arde".
- A signature "Arde" written below "Arde".
- A signature "Arde" written to the left of the circular stamp.
- A signature "Arde" written below the circular stamp.

Sri Sathya Sai College for Women, Bhopal
(An Autonomous College Affiliated to Barkatullah University Bhopal)
Department of Higher Education, Govt. of M.P.
Under Graduate Syllabus (Annual Pattern)
As recommended by Central Board of Studies and approved by the Governor of M. P.
wef 2023-2024
(Session 2023-24)
(NEP-2020)

Class	B.A. / B.Com.
Year	III Year
Subject	Computer Science
Course Title	Computer Network Management Lab
Course Type	Elective
Credit Value	2
Max. Mark	30+70(Minimum Marks 35)

Course Outcome: On successful completion of this course , the students will be able to:

- Understand concepts and terminology of Networking.
- Understand structured Network cabling with Copper and Fiber.
- Architect & Design a network as per requirement.
- Manage and Troubleshoot faults in network using NMS and different tools.

Particular

List of Practicals:

1. Study of UTP network cable

- Study the color code of UTP cable
- Categories of UTP Network cable
- Shielding of Network cable
- Electricity interference with Network cable
- Maximum length UTP Cable can be used for Data cabling;
- Crimping of RJ45 connector and Punching of data Network cable
- Penta scanning of cabling work
- Rules of UTP laying
- Straight cable and cross cable paring. Usage of straight cable and cross cable.
- Color code of "Parallel/straight Cable" Cross cable.
- Tools like – Crimping Tool, Punching Tool, nose plier, Wire Stripping and Cable Cutter, Multi-meter, RJ45 RJ11 RJ12 Cat5, Cat6 Network Cable Tester, In-Line Coupler (RJ45 F/F), RJ45 NETWORK SPLITTER ADAPTER 2 way.

2. Knowledge of Structured Cabling and its components

- Information outlet with box
- Network Rack (4U, 6U, 9U, 12U, 24U, 32U, 42U)
- Patch Panel
- Rack Management

Analya

[Signature]

Aida
Akumar
[Signature]

3. Study of Optical Fiber cable

- Different cores of OFC (6 core, 12, 24 core)
- Multimode & Single mode OFC cable
- Shielding of OFC
- Splicing/Termination of OFC
- OTDR Testing
- LIU fixing
- LIU management (pigtail/fiber patchcord)
- Media Convertor
- SFP module
- Rules of OFC laying

4. Use of tools

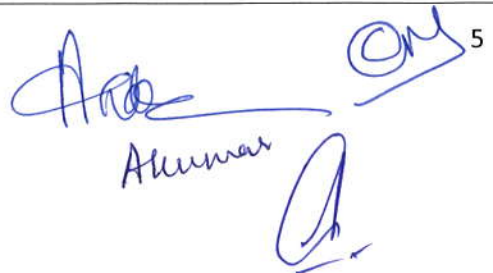
- Crimping Tool
- Punching Tool
- Nose plier
- Wire Stripping and Cable Cutter
- Multimeter
- RJ45 RJ11 RJ12 Cat5 Cat6 Network Cable Tester
- In-Line Coupler (RJ45 F/F)
- RJ45 NETWORK SPLITTER ADAPTER 2-way.

5. Study of Network Devices

- Familiarity with current infra technology Router, Modem, Repeater, Hub, Switch, Core Switch, Distribution Switch, Access Switch, Firewall, Unified Threat Management of different Vendors Name, Model and Technology.
- Difference b/w function of hardware and usage "HUB-SWITCH-ROUTER-REPEATERS-EXTENDER" CAT 6 Cables & RJ 45 connectors, RJ45 CAT6E LAN I/O.
- Gigabyte LAN card 1000mbps

6. Configuration/ Management of Local Area Network

- Implementation of file and printer sharing.
- Installation of ftp server and client.
- Connect the computers in Local Area Network.
- Configuring Class A IP Address on LAN Connection in Computer LAB and then use following tools : ping, ip-config, getmac, hostname, nslookup, tracert, arp, pathping, systeminfo.
- Configure static routing using packet tracer software
- Configure Dynamic routing using packet tracer
- Configure VLAN using Managed switch Device / Packet tracer
- Implementation of Sub netting in Class A B and C
- Ping between 2 systems using IPv6
- Configuration of NAT for incoming packet request
- Configuration of Software / Hardware firewall to block outgoing requests to facebook.com.
- Configure DHCP service for local office, school /college environment without AD Setup or server machine.
- Configure internet by mobile Phone.
- Configure internet BY Proxy server.
- In IE what is proxy server setting, Explain 3 different scenario.



5

Suggestion Books:

1. Mani Subramanian, Network Management Principles and Practice; 2nd Edition, Pearson Education.
2. Morris Mano, Network Management, Pearson Education.
3. Mark Burges, Principles of Network System Administration, Wiley DreamTech.

Suggested Digital Platforms Web links:

- <https://www.youtube.com/watch?v=qiQR5rTSshw>
- Free CCNA | Network Fundamentals - Day 1 (<https://www.youtube.com/watch?v=n2D1o-aM-2s>)
- Free CCNA | Network Devices <https://www.youtube.com/watch?v=H8W9oMNSuwo>
- Free CCNA | OSI Model & TCP/IP Suite (<https://www.youtube.com/watch?v=t-ai8JzhHuY>)
- Free CCNA | Interfaces and Cables | Day3 (<https://www.youtube.com/watch?v=ieTH5IVhNaY>)
- Free CCNA | Intro to the CLI | Day 4 (<https://www.youtube.com/watch?v=IYbtai7Nu2g>)
- Free CCNA | Ethernet LAN Switching (Part 1) | Day 5 (<https://www.youtube.com/watch?v=u2n762WG0Vo>)
- CCNA | Analyzing Ethernet Switching | Day 6 Lab (<https://www.youtube.com/watch?v=Ig0dSaOQDI8>)
- Free CCNA | IPv4 Addressing (Part 1) | Day7 (<https://www.youtube.com/watch?v=3ROdsfEUuhs>)
- Free CCNA | IPv6 Part 1 | Day 31 (<https://www.youtube.com/watch?v=ZNuXyOXae5U>)
- Free CCNA | IPv6 Part 3 | Day 33 (<https://www.youtube.com/watch?v=rwkHfsWQwy8>)

Suggested equivalent online courses:

- Demystifying Networking (04 weeks)
- Cyber Security (15 Weeks)
- <https://www.edx.org/learn/computer-networking>

Scheme of Marks:

Maximum Marks: 100		
Internal Assessment :	Class Interaction / Quiz Attendance Assignments (Charts / Model Seminar / Rural Service / Technology Dissemination / Report of Excursion / Lab Visits / Survey / Industrial visit)	30
External Assessment:	Viva Voce on Practical Practical Record File Table Work / Experiments	70
		Total 100

6