

**SES's L.S. RAHEJA COLLEGE OF ARTS AND COMMERCE
(AUTONOMOUS)**



BOARD OF STUDIES: Information Technology and Data Science

Programme: B.Sc. (Cyber Security & Digital Forensics)

Semester: II

Nomenclature of the Course: Network Utilities & Diagnostics

NEP Vertical: SEC

Credit: 02

Total Marks: 50

Academic Year: 2026–27

(As per Choice Based Credit System under NEP 2020)



Unit-wise Detailed Syllabus

Unit	Detailed Contents	Andragogy	Hours
Unit I: Network Diagnostic Fundamentals	1. Introduction to Network Troubleshooting 2. OSI-based Troubleshooting Approach 3. TCP/IP Diagnostic Concepts 4. Common Network Errors 5. Network Performance Parameters (Latency, Bandwidth, Packet Loss) 6. Basic Network Monitoring Concepts	Concept explanation with troubleshooting flowcharts. Hands-on: • Diagnose connectivity issues • Identify IP misconfiguration • Measure latency using ping	15
Unit II: Network Utility Tools & Practical Diagnostics	1. Ping & Tracert / Traceroute 2. Ipconfig / Ifconfig 3. Netstat & ARP 4. Nslookup & DNS Diagnostics 5. Wireshark (Basic Packet Observation) 6. Network Configuration Verification 7. Basic Report Preparation	Live diagnostic sessions. Hands-on: • Perform ping and trace route tests • Analyze active connections using netstat • Perform DNS lookup • Capture and inspect packets (basic) • Prepare troubleshooting report	15

Learning Objectives

1. To understand structured network troubleshooting methods.
2. To use diagnostic utilities effectively.
3. To analyze network performance issues.
4. To prepare basic troubleshooting reports.

Course Outcomes (CO)

CO No.	Course Outcome	Bloom's Level
CO1	Explain network troubleshooting concepts	Understand (L2)
CO2	Use network diagnostic tools effectively	Apply (L3)
CO3	Analyze connectivity and performance issues	Analyze (L4)
CO4	Prepare basic network diagnostic reports	Apply (L3)

Suggested Readings

Sr. No.	Title	Author / Source
1	Troubleshooting with the Windows Networking Tools	Microsoft Documentation
2	TCP/IP Illustrated, Volume 1	W. Richard Stevens
3	Wireshark Network Analysis (3rd Ed.)	Laura Chappell
4	Network Troubleshooting Tools	Joseph D. Sloan
5	CompTIA Network+ Study Guide	Todd Lammle
6	Cisco Networking Academy – Networking Essentials	Cisco Press

QUESTION PAPER PATTERN

(A) Continuous Evaluation – 20 Marks

Particulars	Marks
Class Test	10
Tool-based Assignment / Journal	10
Total	20

(B) Semester End Examination – 30 Marks

Duration: 1 Hour

Question No.	Description	Total Marks
Q1	Attempt Unit I	15
	A – Remembering	
	B – Analysing	
	C – Applying	
OR		
	P – Remembering	15
	Q – Analysing	
	R – Applying	
Q2	Attempt Unit II	15
	A – Remembering	
	B – Analysing	
	C – Applying	
OR		
	P – Remembering	15
	Q – Analysing	
	R – Applying	