

Maharashtra State Board of Technical Education, Mumbai

LABORATORY PRACTICAL PLANNING

K2-A

Academic Year: 2025–2026

Academic Year: 2025-26

Date: 10/12/2025

Institute Name & Code: K. K. Wagh Polytechnic, Nashik-3 (0078)

Program & Code: Artificial Intelligence & Machine Learning (AN) **Course Code & Abbr.:** 314318 (DCN)

Course Name: Data Communication and Computer Network

Name of Faculty: Mr. S. V. Waghmare

Class: SYAN

Course Index: 403

Semester: IVth

Scheme: K

Total Hrs: 60

• Course Outcomes (COs):

By learning course Data Communication and Computer Network (DCN-314318) Second Year students will be able to:

- CO403.1 - Analyze the functioning of Data Communication and Computer Network.
- CO403.2 – Select relevant Transmission Media and Switching Techniques as per need
- CO403.3 - Analyze the Transmission Errors with respect to IEEE standards.
- CO403.4 - Configure different TCP/IP services.
- CO403.5 - Implement relevant Network Topology using Networking Devices.

• Teaching-Learning and Assessment Scheme:

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL Practical				Based on SL		
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
													Max	Min	Max	Min	Max	Min	Max	Min	
314318	Data Communication & Computer Network	DCN	DSC	3	-	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175

@ indicates Internal Practical Exam.

• Laboratory Learning Outcome (LLO)

- ✓ LLO 1.1 Implement Amplitude Shift Keying(ASK)
- ✓ LLO 2.1 Implement Frequency Shift Keying(FSK)
- ✓ LLO 3.1 Implement Phase Shift Keying(PSK)
- ✓ LLO 4_1 Create standard network straight cable by using cable tester.
- ✓ LLO 5.1 Create standard Cross network cable by using cable tester.
- ✓ LLO 6.1 Use basic programming skills to simulate communication systems.
- ✓ LLO 6.2 Debug and execute the program for Time Division Multiplexing(TDM).
- ✓ LLO 7.1 Transfer data using Bluetooth.
- ✓ LLO 8.1 Identify different error detection methods. LLO 8.2 Detect errors using Checksum.
- ✓ LLO 9.1 create WI-FI environment.
- ✓ LLO 11.1 Implement C Program for CRC
- ✓ LLO 12.1 Implement Hamming code in any suitable programming language.
- ✓ LLO 13.1 Use IP address and appropriate subnet mask for given problem statement.
- ✓ LLO 14.1 Implement IP addresses for intranet in Class A, Class B, Class C.
- ✓ LLO 15.1 Troubleshoot computer network using commands.
- ✓ LLO 16.1 Troubleshoot computer network using commands.
- ✓ LLO 17.1 Use wireshark packet sniffer software.
- ✓ LLO 18.1 Measure various types of Delay by using Wireshark.
- ✓ LLO 20.1 Install server operating system
- ✓ LLO 23.1 Configure HTTP server on given operating system.
- ✓ LLO 24.1 Use star topology for a given situation.
- ✓ LLO 27.1 Survey existing network infrastructure.
- ✓ LLO 28.1 Transfer a file from one computer to another.
- ✓ LLO 28.2 Print documents from remote system in a network.

• **Lab Plan:**

Sr. No.	CO	LLO	Name of Practical	Planned Date	Performance Date	Remarks	Related Self Learning (if any)
1.	CO1	1.1	* Amplitude Shift Keying(ASK) using any simulator	A-17/12/2025 B-15/12/2025 C-16/12/2025			
2.	CO1	2.1	Frequency Shift Keying(FSK) using any simulator	A-18/12/2025 B-19/12/2025 C-20/12/2025			
3.	CO1	3.1	Phase Shift Keying(PSK) using any open source simulation software	A-24/12/2025 B-22/12/2025 C-23/12/2025			
4.	CO2	4.1	*Create and Test standard straight network cable(Universal Colour Code) using crimping tool	A-31/12/2025 B-26/12/2025 C-27/12/2025			
5.	CO2	5.1	Create and Test standard Cross network cable(Universal Colour Code) using crimping tool	A-01/01/2026 B-29/12/2025 C-30/12/2025			
6.	CO3	7.1	*Create a Hybrid Network Using Bluetooth	A-07/01/2026 B-02/01/2026 C-03/01/2026			
7.	CO2	6.1 6.2	* Generate a Time Division Multiplexing (TDM) signal using relevant simulation software	A-08/01/2026 B-05/01/2026 C-06/01/2026			
8.	CO3	8.1 8.2	*Locate the error bit in the given data string by applying checksum error detection method	A-15/01/2026 B-09/01/2026 C-10/01/2026			
9.	CO3	9.1	*Implement Wireless network	A-21/01/2026 B-12/01/2026 C-13/01/2026			
10.	CO3	11.1	*Write a 'C' program for Cyclic Redundancy Check(CRC) error detection	A-22/01/2026 B-16/01/2026 C-17/01/2026			
11.	CO3	12.1	*Write a 'C' program for error correction using Hamming code	A-28/01/2026 B-19/01/2026 C-20/01/2026			
12.	CO4	13.1	*Configure static IP address in operating system along with appropriate subnet mask for given problem	A-29/01/2026 B-23/01/2026 C-24/01/2026			
13	CO4	14.1	* Implement Class full Address in a given network node i)Identify range of IP Address in various classes ii)Justify the reason to choose various IP address classes for creating given network	A-04/02/2026 B-30/01/2026 C-27/01/2026			
14	CO4	15.1	*Execute TCP/IP network commands:ipconfig,ping,tracert	A-11/02/2026 B-02/02/2026 C-31/01/2026			
15	CO4	16.1	*Execute TCP/IP network commands: netstat, pathping, route	A-12/02/2026 B-06/02/2026 C-03/02/2026			
16	CO4	17.1	Install Wireshark and configure as packet sniffer- i) Capture IP, TELNET, FTP packets using Wireshark	A-18/02/2026 B-09/02/2026 C-07/02/2026			

17	CO4	18.1	Capture TCP and UDP packet using Wireshark	A-25/02/2026 B-13/02/2026 C-10/02/2026			
18	CO4	20.1	Install Operating System Linux/Windows/Any other Server	A-26/02/2026 B-16/02/2026 C-14/02/2026			
19	CO5	23.1	*Create HTTP server	A-04/03/2026 B-20/02/2026 C-17/02/2026			
20	CO5	24.1	*Create computers using Star topology with wired media	A-05/03/2026 B-23/02/2026 C-21/02/2026			
21	CO5	25.1	Create Tree topology using CISCO packet tracer software	A-11/03/2026 B-27/02/2026 C-24/02/2026			
22	CO5	27.1	*Visit your computer laboratory- i) Identify the type of topology ii) Identify types of connecting devices with specifications iii) Identify types of cables with specifications iv) List the type of network applications commonly used in the laboratory iv) Draw the layout of installed network	A-12/03/2026 B-02/03/2026 C-28/02/2026			
23	CO5	28.1	Share folder and printer in a network	A-18/03/2026 B-09/03/2026 C-10/03/2026			

●Practical wise LLO-CO Mapping:

Practical. No.	LLO	CO403.1	CO403.2	CO403.3	CO403.4	CO403.5
1	1.1	✓				
2	2.1	✓				
3	3.1	✓				
4	4.1		✓			
5	5.1		✓			
6	7.1			✓		
7	6.1 6.2		✓			
8	8.1 8.2			✓		
9	9.1			✓		
10	11.1			✓		
11	12.1			✓		
12	13.1				✓	
13	14.1				✓	
14	15.1				✓	
15	16.1				✓	
16	17.1				✓	
17	18.1				✓	
18	20.1				✓	
19	23.1					✓
20	24.1					✓
21	25.1					✓
22	27.1					✓
23	28.1					✓

• Rules for Formative Assessment:

• Formative Assessment Criteria:

Performance Indicators		Weightage
Process Related (15 Marks)		60%
1	Practical Implementation with Specified	40%
2	Handling of Network components:	10%
3	Follow ethical practices	10%
Product Related (10 Marks)		40%
1	Correctness of Practical:	15%
2	Timely Submission:	15%
3	Answer to Sample questions:	10%
Total (25 Marks)		100%

- ✓ Formative assessment of each practical is based on Process related (15 marks) and Product related (10 marks) - Total out of 25 marks as per the assessment scheme prescribed by MSBTE
- ✓ Final Formative Assessment (F.A.) of 25 marks is calculated as follows:

$$FA\ Marks = ((Total\ obtained\ marks) * 25) / (25 * Total\ Number\ of\ practicals)$$

• Summative Assessment Criteria:

- ✓ Final assessment of 25 Marks for all practicals.
- ✓ A comprehensive Final Practical End Semester examination (SA-PR of 25 Marks) will be conducted by MSBTE at the end of semester. Examiner for this examination will be Internal examiner.
- ✓ Final assessment of 25 Marks for all practicals.
- ✓ Summative Assessment (SA-PR) for 25 Marks will be conducted by MSBTE after the completion of the term.
- ✓ The schedule of MSBTE Practical Examination will be display on Notice board prior to examination.

• SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher
1	Behrouz A. Forouzan	Data Communications & Networking	Tata McGraw Hill, New Delhi, 2006, ISBN:9780-07-296775-3
2	Andrew S. Tanenbaum	Computer Networks	PHI Learning Pvt. Ltd. Delhi, ISBN-13:978-0-13-212695-3
3	Achyut Godbole	Data Communication & Networks	Tata McGraw Hill, New Delhi, 2006, ISBN: 0070472971
4	Comer Douglas E.	Internetworking with TCP/IP, Principles, Protocols & Architecture	PHI Learning Pvt. Ltd. Delhi, ISBN-81-203-2065-4

• LEARNING WEBSITES & PORTALS

Sr. No.	Link /Portal	Description
1	http://ww38.nptelvideos.in/2012/11/data-communication.html	data-communication
2	http://www.myredingroom.co.in/notes-and-studymaterial/68-den/750-conversion-techniques.html	Conversion techniques notes and study material
3	http://www.tutorial-reports.com/wireless/wlanwifi/wifi_architecture.php	Wifi Architecture
4	https://www.standards.ieee.org/about/get/802/802.11.html	IEEE Standard
5	www.tutorialspoint.com/data_communication_computer_network	Computer Networks
6	https://www.studytonight.com/computer-network/overview-of-computer-networks	Computer Network Overview
7	https://www.whirlpool.net.au/wiki/windows_nw_diags_cmds	Windows Network Commands
8	https://www.scanfree.com/programs/c/c-program-to-implement-crc-cyclic-redundancy-code	CRC Redundancy

•**Tools for conducting Practicals:**

1. Wireshark(<https://www.wireshark.org/download.html>) or any other Packet Analyser Tool
2. Simulation Software: CISCO Packet Tracer, CORE Network Emulator or Similar
3. Google classroom
4. YouTube
5. MKCL LMS-Learn Live

Mr. S V Waghmare
Faculty

Mrs. R. Y. Thombare
(HOD-AN)

CC: 1. Lab File 2. Course File-DCN 3. Notice Board-AN Lab-02 4. Formative Assessment