Maharashtra State Board of Technical Education, Mumbai
TEACHING PLAN (TP-TH)/ Course Information Sheet (CIS)

K-1

Academic Year: 2025-26 **Date:** 08/12/2025
Institute Name: K. K. Wagh Polytechnic, Nashik **Institute Code:** 0078
Program and Code: Computer Technology (CM) **Course Code &. Abbr.:** 314318 (DCN)
Course Name: Data Communication & Computer Network (DCN) **Course Index:** CI403 **Scheme:** K
Class: SYCM-Mac **Semester:** 4th **Name of Faculty:** Mrs.S.S.Gaikwad **Learning Hrs:** 48

• Teaching-Learning & Assessment Scheme:

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

Abbreviations: CL- Class Room Learning, TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS – Indian Knowledge System, SLA - Self Learning Assessment
Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

• Course Outcomes (COs): Theory & Practical

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

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO403.1 (CO1)	**Analyze the functioning of Data Communication and Computer Network**	
	TLO 1.1	Describe the role of the given component in the process of data communication
	TLO 1.2	Compare the characteristics of analog and digital signals on the given parameter
	TLO 1.3	Explain the process of data communication using the given mode
	TLO 1.4	Classify computer networks on the specified parameter
CO403.2 (CO2)	**Select relevant Transmission Media and Switching Techniques as per need.**	
	TLO 2.1	Explain with sketches the construction of a given type of cable
	TLO 2.2	Explain with sketches the characteristics of the given type of unguided transmission media
	TLO 2.3	Explain with sketches the working of the given Multiplexing technique
	TLO 2.4	Describe with sketches the working principle of the given Switching technique
	TLO 2.5	Compare different Switching techniques on the given parameter
CO403.3 (CO3)	**Analyze the Transmission Errors with respect to IEEE standards**	
	TLO 3.1	Explain working of the given error detection and correction method
	TLO 3.2	Explain features of the given IEEE communication standard
	TLO 3.3	Explain characteristics of the given layer in IEEE802.11 architecture
	TLO 3.4	Explain with sketches the process of creating a Bluetooth environment using the given architecture
	TLO 3.5	Compare the specified generations of mobile telephone systems on the given parameter.
CO403.4 (CO4)	**Configure different TCP/IP services**	
	TLO 4.1	Identify functions and features of the given layer of OSI Reference model
	TLO 4.2	Compare the specified service on the given parameters
	TLO 4.3	Classify IP Addresses on the basis of its class from the given set of addresses
	TLO 4.4	Distinguish between IPv4 and IPv6on the given parameters
	TLO 4.5	Describe with sketches the procedure to configure the given TCP/IP service
CO403.5 (CO5)	**Implement relevant Network Topology using Networking Devices**	
	TLO 5.1	Compare different computing models on the given parameter
	TLO 5.2	Identify relevant network topology for the given situation
	TLO 5.3	Compare different topologies on the given parameter
	TLO 5.4	Select network connecting device for the given situation
	TLO 5.5	Describe with sketches the procedure to configure the given networking device

❖ Teaching Plan:

Unit No. (Allotted Hrs. & Marks)	COs & TLOs	Unit Title with Topic Details/Contents	Planned Dates (From-To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Method/ Media	Remark
01 (10) (16)	CO1 TLO-1.1, 1.2, 1.3. 1.4	**Unit-1 Fundamentals of Data Communication and Computer Network** 1..0 Overview of the Course, Prerequisites, Scope, Skills, Career & Opportunities, MNCs	15/12/2025 (01) (01 Ex)		Chalk-Board, LCD+PPTs,	
		1.1 Process of data communication and its components: Transmitter, Receiver, Medium, Message, Protocol 1.2 Protocols, Standards, Standard organizations, Bandwidth, 1.3 Data Transmission Rate, Baud Rate and Bits per second 1.4 Modes of Communication (Simplex, Half duplex, Full Duplex)	02/01/2025 to 06/01/2025 (04)		Chalk-Board, LCD+PPTs, eNotes, MKCL ERA, YouTube Videos	
		1.5 Analog Signal and Digital Signal, Analog and Digital Transmission 1.6 Analog to Digital, Digital to Analog Conversion 1.7 Fundamental of Computer Network: Definition and Need of Computer Network 1.8 Applications, Network Benefits	(04)		Chalk-Board, LCD+PPTs, eNotes, CORE Network Emulator Online Web Reference	
		1.9 Classification of Network 1.10 LAN, WAN, MAN	(02)		Chalk-Board, LCD+PPTs,	
02. (10) (14)	CO2 TLO-2.1 2.2 2.3 2.4 2.5	**Unit-2 Transmission Media and Switching** 2.1 Communication Media: Guided Transmission Media 2.2 Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable 2.3 Unguided Transmission Media 2.4 Radio Waves, Microwaves 2.5 Infrared, Satellite	(05)		Chalk-Board, LCD+PPTs, Demo of UTP cable, optical fibre cable, Coaxial cable	
		2.6 Line-of-Sight Transmission, Point-to-Point, Broadcast 2.7 Multiplexing: Frequency-Division Multiplexing 2.8 Time -Division Multiplexing 2.9 Switching: Circuit-switched network 2.10 Packet switched network	(05)		Chalk-Board, LCD+PPTs, MKCL ERA, YouTube Videos	
03. (08) (14)	CO3 TLO-3.1 3.2 3.3 3.4 3.5	**Unit3 Error Detection and Correction** 3.1 Types of Errors, Forward Error Correction Versus Retransmission 3.2 Framing: Fixed Sized and Variable Sized 3.3 Error Detection: Repetition codes, 3.4 Parity bits, Checksums, CRC	(04)		Chalk-Board, LCD+PPTs,	
		3.5 Error Correction: Automatic Repeat Request (ARQ), Hamming Code 3.6 Wireless LAN IEEE 802.11 standard Architecture, Features of IEEE 802.11 versions:802.11,802.11a,802.11b,802.11g,802.11n,802.11p	(04)		Chalk-Board, LCD+PPTs, CORE Network Emulator	

		3.7 Bluetooth Architecture: Piconet, Scatternet 3.8 Mobile Generations: 3G, 4G and 5G			YouTube Videos	
04. (12) (18)	CO4 TLO-4.1 4.2 4.3 4.4 4.5	**Unit4 Network Communication Models** 4.1 THE OSI MODEL: Layered Architecture, Encapsulation 4.2 Layers in OSI Model (Functions of each layer)-Physical Layer 4.3 Data-Link Layer, Network Layer, Transport Layer, Session Layer 4.4 Presentation Layer, Application Layer	(04)		CORE Network Emulator, YouTube Videos	
		4.5 TCP/IP Layers and their functions: Host To Network Layer, Internet Layer, Transport Layer, Application Layer 4.6 Protocols: Host To Network Layer-SLIP, PPP, Internet Layer-IP, ARP, 4.7 RARP, ICMP, Transport Layer-TCP and UDP, Application Layer-FTP, HTTP, SMTP, TELNET, BOOTP, DHCP 4.8 Addressing: Physical Address, Logical Address, Port Address	(04)		Chalk-Board, LCD+PPTs, YouTube Videos Network Tool-Wireshark	
		4.9 IP Address-Concept, Notation, Address Space 4.10 IPv4 Addressing: Classful and Classless Addressing, subnet mask, 4.11 Supernetting, Subnetting 4.12 IPV6 Addressing scheme and basic structure	(04)		Chalk-Board, LCD+PPTs, YouTube Videos	
05. (05) (08)	CO5 TLO-5.1 5.2 5.3 5.4 5.5	**Unit5 Network Topologies and Network Devices** 5.1 Network Computing Model: Peer to Peer, Client Server 5.2 Network Topologies: Introduction, Definition, Selection criteria, Types of Topology- Star, Mesh, Tree, Hybrid	(02)		Chalk-Board, LCD+PPTs, YouTube Videos CORE Network Emulator	
		5.3 Network Connecting Devices: Switch Router 5.4 Repeater, Bridge 5.5 Gateways and Modem	(03)		Chalk-Board, Demo using Ethernet Switch, Modem	
		Total	**45 Hrs.**			

- **Chapter wise CO-PO Mapping:**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes PSOs	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO-2
CO1	1	-	2	1	-	-	1	1	-
CO2	1	1	2	1	-	1	1	1	1
CO3	1	2	1	1	-	-	1	1	1
CO4	1	2	2	1	-	1	1	1	-
CO5	-	2	2	1	1	1	1	1	1

Legends: - High:03, Medium:02, Low:01, --: No Mapping

- **POs and PSOs :**

Sr. No.	Programme Outcomes (POs)	Programme Specific Outcomes (PSOs)
1.	**PO-1** Basic and Discipline Specific Knowledge	**PSO1:** Apply acquired skills of programming, networking, hardware & database for computer based
2.	**PO-2** Problem Analysis	

3.	**PO-3** Design/ Development of Solution	problem solving and software development. **PSO2:** Pursue higher studies in the field of Computer Science / Computer Engineering / Information Technology.
4.	**PO-4** Engineering Tools	
5.	**PO-5** Engineering Practices for Society, Sustainability and Environment	
6.	**PO-6** Project Management	
7.	**PO-7** Life Long Learning	

• Weightage to Learning Efforts & Assessment Purpose (Specification Table):

Unit No.	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	Fundamentals of Data Communication and Computer Network	CO1	10	04	08	04	16
2	Transmission Media And Switching	CO2	10	04	04	06	14
3	Error Detection and Correction	CO3	08	04	04	06	14
4	Network Communication Models	CO4	12	04	06	08	18
5	Network Topologies And Network	CO5	05	02	02	04	08
		Total :	**45**	**18**	**24**	**28**	**70**

*# **Learning Levels with reference to Bloom's Taxonomy:** R-Level: Remember, U-Level: Understand, A-Level: Apply*

• Formative & Summative Assessment Criteria:

▪ Theory Assessment:

a) Theory Formative assessment (TH-FA):

- Two class tests each of 30 marks will be conducted as per MSBTE guidelines. The average of two class test marks will be consider for final TH-FA out of 30 marks.

b) Summative Assessment (TH- SA):

- The Final comprehensive end semester theory written assessment examination will be conducted by MSBTE for 70 marks. Question Paper setting and Assessment of answer papers is performed by MSBTE at the state level.
- Final Theory Score out of 100 Marks will be derived as the total score as below:
  TH-SA [out of 70] + TH- FA [Test Avg score out of 30] = 100 Marks

▪ Practical Assessment:

1. Formative Assessment (FA) of each practical/experiment will be performed progressively for 50 marks. The assessment will be performed based on the Regularity in Practical Performance, Tool Selection Ability, Use of Appropriate tool to perform the Identified tasks, Algorithm/Solution developed, Quality of output achieved, Answer to sample questions and Submit report in total time.
2. Final Term Work (FA-PR) of 50 marks is calculated based on scores in Formative Assessment for all practicals/experiments as:
   Term Work Marks = ((Sum of Total Marks Scored in FA * 50) / (Total of Number of Experiments)) *100
3. Self-learning Activities (SLA) includes Micro project / Assignment / other activities related to subject/course and it will be evaluated out of 25 Marks.
4. A Summative (comprehensive) Assessment (SA-PR) of Practical will be performed as End Semester Examination (ESE). The SA-PR will be for 50 Marks with MSBTE guidelines at the end of semester. The schedule of MSBTE Practical ESE will be display on Notice board prior to examination.

• References:

1. Suggested Books for Reference:

Sr. No	Author	Title of the Book	Publisher
1.	Behrouz A. Forouzan	Data Communication and Networking	McGraw-Hill Education, 2012 ISBN- 0073376221, 9780073376226
2.	Behrouz A. Forouzan	TCP/IP Protocol Suite	McGraw Hill Education; 4th edition (1 July 2017) ISBN-13:978-0070706521

3.	A.S. Tanenbaum	Computer Networks	Pearson; 5th edition (2 Dec.2010), ISBN-10:0132126958 ISBN-13:978-0132126953
4.	Godbole Achyut	Data Communication and Networks	McGraw-Hill Education (India) Pvt Limited, 2011 ISBN-0071077707, 9780071077705
5.	Comer Douglas E.	Internetworking With TCP/IP Principles, Protocols, And Architecture - Volume I	PHI (1 January 2013) ISBN-10:9332550107 ISBN-13:978-9332550100

2. Learning Websites URLs & Portals:

Sr. No	Website /Portal Link/URL	Description
1	https://www.geeksforgeeks.org/data-communication-definition-components-types-channels/	Data Communication-Definition, Components, Types, Channels
2	https://www.tutorialspoint.com/data_communication_computer_network/index.htm	Data Communication and Computer Network
3	https://nptel.ac.in/courses/106105081	Computer Networks
4	https://nptel.ac.in/courses/106105183	Computer Networks and Internet Protocol
5	Introduction To Computer Networks | Study to night	Introduction To Computer Networks
6	http://www.myredingroom.co.in/notes-and-studymaterial/68-den/750-conversion-techiniques.html	Conversion Techniques
7	http://www.standards.ieee.org/about/get/802/802.11.html	802 standards
8	http://www.studytonight.com/computer-network/overview-of-computer-networks	Overview of computer networks
9	http://www.nptel.ac.in/downloads/106105080/	computer networks basics
10	http://www.scanftree.com/programs/c/c-program-to-implement-crc-cycic-redundancy-code	c-program to implement cyclic redundancy code

3. URLs of referred YouTube Videos:

Sr. No	URL/YouTube Link	Topic/ Description
1	https://youtu.be/eFJJ2anv41Q	Data Communication & computer Network
2	https://youtu.be/OZReBdwRY-c	Create network cable including cross cable and test by using cable tester
3	https://youtu.be/ECP16xRNR3A	Peer to peer configuration
4	https://youtu.be/ik-Y5n-U2So	Connect computers using given topology (Star)
5	https://youtu.be/Mhru18gxIXo	Share printer and folder in a network and transfer a file from one computer to another
6	https://youtu.be/ZIw7Pw7iL58	IEEE 802.11 Standard (Wireless networking)
7	https://youtu.be/IbqZPbx8K58	IEEE 802.11 Addressing Mechanism
8	https://youtu.be/4KITNWpaLy4	Cyclic Redundancy Check

4. Self-Prepared Video URLs:

Sr. No	URL/YouTube Link	Topic/ Description
1	https://www.youtube.com/watch?v=2ll5-ujFQY4	Fundamentals of Data Communication & Computer Network
2	https://www.youtube.com/watch?v=zgXNcCxJLAI	Network connecting devices
3	https://www.youtube.com/watch?v=xL_y4LlsRo8	Transmission Media
4	https://www.youtube.com/watch?v=_xhnUYVcJ4c	OSI Reference Model
5	https://www.youtube.com/watch?v=EETAaM-hO2w	TCP/IP Reference Model
6	https://www.youtube.com/watch?v=mDRq6-mS1do	IEEE Standards & Bluetooth Architecture
7	https://www.youtube.com/watch?v=pySK83e1krI	Network Topologies

5. Tools to Use for Teaching-Learning, Assessment and Evaluation:

- **Google Classroom –** It will be used to/for:
  - Organized Sharing of the Learning material such as PPTs, eNotes, Question Banks, Sample Solutions with students by class.
  - Conduction of the MCQ Tests and its evaluation.
  - Online sharing of Assignments and the Assessment of Assignments.
  - Monitor the students response and progress.
- **MKCL ERA LMS: –** The use of MKCL ERA LMS is/for:
  - Sharing by the Class, the Learning material such as PPTs, eNotes, Video Links by the Units
  - Sharing of Question Banks, Sample Solutions with students by class.
  - Conduct the Unit wise Quiz and perform evaluation of students.
  - Online Conduction of the Tests/Assignments and its assessment.
  - Using this detailed student's reports about his/her performance can be made available.

Mrs.S.S.Gaikwad
(Faculty Name & signature)

Prof. G. B. Katkade
(HOD-Computer Tech. Dept.)

CC-

1. DCN - 314318 Course File
2. Notice Board / ERP
3. Institute Website
4. CIAAN Coordinator