Format K1

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP)

Academic Year: 2026-27 (ODD)
Institute Code and Name: 0078- K K Wagh Polytechnic, Nashik **Semester: Third**
Programme and Code: Information Technology (IF) **Course Index: 301**
Course and Code: Data Structure using C (DSU) **Course Code: 313301**
Scheme: K **Allocated Hrs. 45** **Name of Faculty: Mrs. M. P. Nawarkar** **Class: SYIF (Cray)**

COURSE LEVEL LEARNING OUTCOMES (COS)

- CO1 - Perform basic operations on Arrays.
- CO2 - Apply different Searching and Sorting methods.
- CO3 - Implement basic operations on Linked List.
- CO4 - Perform operations on Stack using Array and Linked List Implementations.
- CO5 - Perform operations on Queue using Array and Linked List Implementations.
- CO6 - Create and Traverse Tree to solve problems.

TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hours / Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		
											FA - TH	SA - TH	Total		FA-PR		SA-PR		SLA		
				CL	TL	LL					Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
313301	Data Structure using C	DSU	DSC	3	1	4	-	8	4	3	30	70	100	40	50	20	25#	10	-	-	175

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom 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

SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	2	-	-	1	-	-	1	2	1
CO2	2	2	2	1	-	-	1	2	2
CO3	2	2	2	1	1	1	1	2	1
CO4	2	2	2	1	-	1	2	2	2
CO5	2	2	2	1	-	1	1	2	2
CO6	2	2	2	1	-	1	1	3	2

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are formulated at institute level

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Unit No. (Allocted Hrs.)	CO	TLO aligned to CO's	Title/Details	Plan (No. of Lectures)		Actual Execution		Pedagogy Used	Remark
				From	To	From	To		
1 (2)	1	1.1 1.2	Introduction: Concept and Need of Data Structure, Definition, Abstract Data Type , Types of Data Structures: Linear Data Structures, Non-Linear Data Structures, operations on Data Structures: Traversing, Insertion, Deletion	2 01/07/26	02/07/26			Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
2 (8)	2	2.1	Searching: Searching for an itemin a data set using thefollowing methods: (i) Linear Search (ii) Binary Search	4 27/08/26	03/09/26			Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
		2.2	Sorting: Sorting of data set in an order using the following methods: (i) Bubble Sort (ii) Selection Sort (iii) Insertion Sort (iv) Quick Sort (v) Merge Sort	4 07/09/26	16/09/26				
3(12)	3	3.1	Difference between Static and Dynamic Memory Allocation, Introduction to Linked List, Terminologies: Node, Address, Pointer, Information field / Data field, Next pointer, Null Pointer, Empty List.	4 17/09/26	24/09/26			Black Board, Chalk, PPT + LCD Video Google Classroom, MKCL Learn Live	

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				From	To	From	To		
3 (12)	3	3.2	Type of Lists: Linear List, Circular List, Representation of Doubly Linked List.	4				Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
				28/09/26	05/10/26				
		3.3	Operations on a Singly Linked List: Creating a Linked List, inserting a new node in a Linked List, deleting a node from a Linked List, searching a key in Linked List, traversing a Singly Linked List. Applications of Linked List.	4					
				07/10/26	15/10/26				
4 (8)	4	4.1 4.2	Introduction to Stack: Definition, Stack as an ADT, Operations on Stack-(Push, Pop), Stack Operations Conditions – Stack Full / Stack Overflow, Stack Empty /Stack Underflow. Stack Implementation using Array and representation using Linked List.	4				Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
				27/07/26	03/08/26				
		4.3 4.4	Applications of Stack: Reversing a List, Polish notations, Conversion of Infix to Postfix expression, Evaluation of Postfix Expression. Recursion: Definition and Applications.	4					
				05/08/26	12/08/26				

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Unit No. (Allocated Hrs.)	CO	TLO aligned to CO's	Title/Details	Plan (No. of Lectures)		Actual Execution		Pedagogy Used	Remark
				From	To	From	To		
5 (6)	5	5.1 5.2	Introduction to Queue: Queue as an ADT, Queue representation in memory using Array and representation using a Linked List. Types of Queues: Linear Queue, Circular Queue, Concept of Priority Queue, Double-Ended Queue.	3				Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
				13/08/26	19/08/26				
		5.3	Queue Operations: INSERT, DELETE Queue Operation Conditions: Queue Full, Queue Empty. Applications of Queue.	3					
				20/08/26	26/08/26				
6(9)	6	6.1 6.2	Introduction to Trees Terminologies: Tree, Degree of a Node, Degree of a Tree, Level of a node, Leaf Node, Depth / Height of a Tree, In-Degree and Out- Degree, Path, Ancestor and Descendant Nodes.	4				Black Board, Chalk, PPT+ LCD Videos, Google Classroom, MKCL Learn Live	
				06/07/26	13/07/26				
		6.3 6.4 6.5	Tree Types and Traversal methods, Types of Trees: General Tree, Binary Tree, Binary Search Tree (BST). Binary Tree Traversal: In- Order Traversal, Preorder Traversal, Post-Order Traversal. Expression Tree, Heap	5					
				15/07/26	23/07/26				
Content Beyond Syllabus			**Graph as a Data Structure**	**Second week of August**					

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ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning) (FA-TH)

- Continuous assessment based on process and product related performance indicators. Each practical will beassessed considering
  - 60% weightage is to process
  - 40% weightage to product

B. Summative Assessment (Assessment of Learning) (SA-TH)

- End semester Examination, Lab performance, Viva-Voce

SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No	Author	Title	Publisher with ISBN Number
1	Lipschutz	Data Structures with 'C' (SIE) (Schaum'sOutline Series)	McGraw Hill Education, New DelhiISBN: 978-0070701984
2	Balgurusamy, E.	Data Structures using 'C'	McGraw Hill Education, New Delhi2013, ISBN:978-1259029547
3	ISRD Group	Data Structures using 'C'	McGraw Hill Education, New Delhi2013, ISBN:978-12590006401
4	Yashwant Kanetkar	Understanding Pointers in C	BPB ISBN 8170298911

LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.javatpoint.com/data-structure-introduction	For All Content
2	https://www.geeksforgeeks.org/introduction-to-data-structures/	For All Content
3	https://studytonight.com/data-structures/	For All Content
4	https://www.tutorialspoint.com/data_structures_algorithms/	For All Content
5	https://www.w3schools.in/data-structures/	For All Content
6	https://www.mygreatlearning.com/blog/data-structure-tutorial-for-beginners/	For All Content
7	https://byjus.com/gate/introduction-to-data-structure-notes/	For All Content

Mrs. M. P. Nawarkar
(Name & Signature of Faculty)

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