VIDHYADEEP UNIVERSITY
Holy Flame of Knowledge

SECOND-YEAR DIPLOMA ENGINEERINGSYLLABUS

Semester: 3RD

Course Code:002204303 **Type of Course:PCC-6**

Course Name: DATA & FILE STRUCTURE

Course Prerequisites: Basic knowledge of data and file structure.

COURSE OBJECTIVE(S):

The course content should be taught and implemented with the aim to develop various types of skills so that students are able to acquire following competency:

• Implement various types of algorithms using Data Structures.

TEACHING & EXAMINATION SCHEME:

Teaching Scheme (Hrs/Week)				Examination Scheme					
Theory	Tutorial	Practical	Credit	SEE		CA			Total
				Th	Pr	MSE	PLE	LA	
3	0	0	3	60	00	20	20	00	100

Th: Theory; Pr: Practical; FA: Final Assessment; CAT: Continuous Assessment Theory; CAP: Continuous Assessment Practical;

*TOTAL Theory Hours: No. of Th. and Tut.Hrs/Week*15 = 45*

COURSE CONTENT(S):

Unit No.	Content	Hours	Weightage (%)
1	**Basic Concepts of Data Structures:** • Data structure basic concepts • Types of data structure: Primitive and non-primitive data structure • Introduction to algorithms • Key features of an algorithm • Analysis terms: Time complexity, Space complexity, Asymptotic notations • Array operations: Row Major Arrays,Column Major Arrays Searching an alimentation array: linear search, binary search	07	20%
2	**Stack and Queue :** • Linear and non-linear data structures • Stack: Array representation of stack, PUSH POP operations on stack, Implementation of stack, Application of stack, Infix, Prefix and Postfix forms of expressions, Recursive Functions(Factorial, greatest common divisor,	12	30%

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	Fibonacci series) • Queue**:** Arrayrepresentationofqueue,Operationsonqueue Implementation of queue, Limitation of simple queue • Concepts of circular queue • Application of queue Differentiate circular queue and simple queue		
3	**Linked list** • Dynamic memory allocation • Linked list presentation • Types of linked list • Basic operations on singly linked list and circular linked list • Concept of Doubly linked list • Difference between circular linked list and singly linked list Applications of the linked list	07	20%
4	**Tree:** • Basic terms: General Tree, Binary trees, levelnumber, degree, in-degree and out-degree,root node, leaf node, directed edge, path, depthComplete Binary Tree, Strict Binary Tree,Conversion of General Tree to Binary Tree • Binary Search Tree: Insertionofanoderinbinarytree, Deletionofanoderinbinarytree,Searchinganoder in binary tree • Binary Tree Traversal: In order, Pre order, Post order Applications of binary tree	12	15%
5	**Sorting and Hashing** • Sorting Methods: BubbleSort,SelectionSort,QuickSort,InsertionSort,MergeSort ,RadixSort • HashingConcepts Hash functions: Division Method, Middle SquareMethod, Folding Method	07	15%
	TOTAL	**45**	**100%**

Text Book(s):

Title of the Book	Author(s)	Publication
Data and file structure		Atulprakashan

Reference Book(s):

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Title of the Book	Author(s)	Publication
Data and File Structures using C	Thareja, Reema	Oxford University Press New
Data Structures	Chitra, A Rajan, PT	Tata McGraw Hill, New Delhi,
Classic Data Structures	Samantha, D.	PHI Learning, New Delhi
Data Structures using C	ISRD Group	McGraw Hill, New Delhi

Web Material Link(s):

a) https://boonsuen.com/process-scheduling-solver
b) http://cpuburst.com/ganttcharts.html
c) https://codepen.io/faso/pen/zqWGQW
d) https://www.tutorialspoint.com
e) www.w3schools.com
f) https://nptel.ac.in/courses/106106144
g) https://nptel.ac.in/courses/106105214
h) https://nptel.ac.in/courses/106102132

Equivalent/Corresponding Course on NPTEL (SWAYAM):

NPTEL course on
https://onlinecourses.nptel.ac.in/noc21_cs02/preview
https://nptel.ac.in/courses/106/105/106105151/

COURSE EVALUATION:

Sr. No.	Activity	Marks	Weightage
1	Semester End Examination (External Th)	60	60%
2	Internal Examination	40	40%
2(a)	Mid Semester Examination	20	
2(b)	Attendance	10	
2(c)	Assessment Types (Any One from 2(c).1 to 2(c).7)	10	
2(c).1	Subject (Course) based Mini-Project		
2(c).2	Industry/Site Visit & Report		
2(c).3	Assignment		
2(c).4	Seminar		
2(c).5	Case Study		
2(c).6	Surprise Class Quiz		
2(c).7	Design Exercise		
2(c).7	Presentation		
2(d)	Practical (if Applicable)		

* For 4 Credit Subjects

1 Credit = 25 Marks
Theory: 3 Credits = 75 Marks
Practicals: 1 Credit = 25 Marks
SEE Evaluation will be of 100 marks and converted to 50 Marks (75 Th + 25 Pr)

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CA Evaluation will be of 100 Marks and converted to 50 Marks. (75 Th + 25 Pr)

Distribution of Marks for Theory Evaluation as per Bloom's Taxonomy Level:

Level	Remember	Understand	Apply	Analyse	Evaluate	Create
% Weightage	20%	10%	10%	15%	10%	20%

COURSE OUTCOMES:*(in the range of 4 to 6)*

CO1	Basic operations on arrays and strings.
CO2	Demonstrate algorithms to insert and delete elements from the stack and queue data structure.
CO3	Apply basic operations on the linked list data structure.
CO4	illustrate algorithms to insert, delete and searching anode in tree.
CO5	sorting and searching algorithms to the small data sets.