



THIRUVALLUVAR UNIVERSITY

SERKKADU, VELLORE-632115

B.Sc. COMPUTER SCIENCE

SEMESTER - II

SYLLABUS

FROM THE ACADEMIC YEAR

2023 - 2024

Semester-II

S.No.	Part	Study Components		Ins. Hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
SEMESTER II									
1.	I	Language	Paper-2	6	3	Tamil/Other Languages	25	75	100
2.	II	English	Paper-2	4	3	English	25	75	100
3.	II	NMSDC: Language Proficiency for Employability	Paper-1	2	2	Overview of English Communication	25	75	100
4.	III	Core Course –CC III	Paper-2	5	5	Data Structures and Algorithm	25	75	100
5.	III	Core Course –CC IV	Paper -3	5	5	Practical: Data Structures and Algorithm Lab	25	75	100
6.	III	Elective II Generic/ Discipline Specific	Elective II	6	3	Numerical Methods-II (or) Discrete Mathematics – II	25	75	100
7.	IV	Skill Enhancement Course SEC-2	Paper2	2	2	Office Automation	25	75	100
8.	IV	Skill Enhancement Course SEC-3 (Discipline Specific)	Paper 1	2	2	PHP Programming	25	75	100
		Sem. Total		32	25		200	600	800

Semester II

Title of the Course/ Paper	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Data Structure and Algorithms	Core	5	-	-	-	4	5	25	75	100
Learning Objectives											
LO1	To understand the concepts of ADTs										
LO2	To learn linear data structures-lists, stacks, queues										
LO3	To learn Tree structures and application of trees										
LO4	To learn graph structures and application of graphs										
LO5	To understand various sorting and searching										
UNIT	Contents										No. of Hours
I	Abstract Data Types (ADTs)- List ADT-array-based implementation-linked list implementation: singly linked lists-circular linked lists-doubly-linked lists - operations- Insertion-Deletion -Applications of lists-Polynomial Addition										15
II	Stack ADT-Operations- Applications- Evaluating arithmetic expressions – Conversion of infix to postfix expression-Queue ADT-Operations-Circular Queue- applications of queues.										15
III	Tree ADT-Binary Tree ADT-expression trees-applications of trees-binary search tree ADT- insertion and deletion operations binary-tree traversals										15
IV	Definition- Representation of Graph-Types of graph-Breadth first traversal – Depth first traversal										15
V	Searching-Linear search-Binary search-Sorting-Bubble sort-Selection sort-Insertion sort-Hashing-Hash functions-Separate chaining-Open Addressing-Rehashing Extendible Hashing										15
	Total										75
Course Outcomes							Programme Outcome				
CO	On completion of this course, students will										
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation						PO1, PO6				
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues						PO2				
CO3	Describe the hash function and concepts of collision and its resolution methods						PO2, PO4				
CO4	Solve problem involving graphs, trees and heaps						PO4, PO6				

CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	PO5, PO6
Text Book		
1	1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, Pearson Education 2014, 4th Edition.	
2	ReemaThareja, “Data Structures Using C”, Oxford Universities Press 2014, 2nd Edition	
Reference Books		
1.	Thomas H.Cormen,ChalesE.Leiserson,RonaldL.Rivest, Clifford Stein, “Introduction to Algorithms”, McGraw Hill 2009, 3rd Edition.	
2.	Aho, Hopcroft and Ullman, “Data Structures and Algorithms”, Pearson Education 2003	
3.	P.Rizwan Ahmed, C++ and Data Structure, Margham Publications, 2014	
Web Resources		
1.	https://www.programiz.com/dsa	
2.	https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/	

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	1	3	3	3
CO 3	3	3	3	2	3	2
CO 4	3	2	3	2	3	3
CO 5	3	3	3	3	3	3
Weightage of course contributed to each PSO	15	14	13	13	15	14

S-Strong-3 M-Medium-2 L-Low-1

Title of the Course/ Paper	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Data Structure and Algorithms Lab [Note: Practicals offered through C++]	Core	-	-	4	-	4	4	25	75	100
Learning Objectives											
LO1	To understand the concepts of ADTs										
LO2	To learn linear data structures-lists, stacks, queues										
LO3	To learn Tree structures and application of trees										
LO4	To learn graph structures and application of graphs										
LO5	To understand various sorting and searching										
Sl. No	Contents										No. of Hours
1.	Write a program to implement the List ADT using arrays and linked lists.										60
2.	Write a program to implement the Stack ADT using arrays and linked lists										
3.	Write a program to implement the Queue ADT using arrays and linked list.										
4.	Write a program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).										
5.	Write a program to perform the following operations: <ul style="list-style-type: none"> • Insert an element into a Doubly Linked List. • Delete an element from a Doubly Linked List. • Search for a key element in a Doubly Linked List. 										
6.	Write a program to perform the following operations: <ul style="list-style-type: none"> • Insert an element into a binary search tree. • Delete an element from a binary search tree. • Inorder, preorder and postorder Traversals of a binary search tree. 										

7.	Write a programs for the implementation of BFS and DFS for a given graph.	
8	Write a programs for implementing the following searching methods: <ul style="list-style-type: none"> • Linear search • Binary search. 	
9.	Write a programs for implementing the following sorting methods: <ul style="list-style-type: none"> • Bubble sort • Selection sort • Insertion sort 	
	Total	60
Course Outcomes		Programme Outcome
CO	On completion of this course, students will	
1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation	PO1,PO4,PO5
2	Understand basic data structures such as arrays, linked lists, stacks and queues	PO1, PO4,PO6
3	Describe the hash function and concepts of collision and its resolution methods	PO1,PO3,PO6
4	Solve problem involving graphs, trees and heaps	PO3,PO4
5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	PO1,PO5,PO6
Text Book		
1	Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, Pearson Education 2014, 4th Edition.	
2	ReemaThareja, “Data Structures Using C”, Oxford Universities Press 2014, 2nd Edition	

Reference Books	
1	Thomas H.Cormen,ChalesE.Leiserson,RonaldL.Rivest, Clifford Stein, “Introduction to Algorithms”, McGraw Hill 2009, 3rd Edition
2.	Aho, Hopcroft and Ullman, “Data Structures and Algorithms”, Pearson Education 2003
Web Resources	
1.	https://www.programiz.com/dsa
2.	https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	1	3	2	3
CO 3	3	3	3	3	2	3
CO 4	3	3	3	3	2	3
CO 5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	15	13	15	13	15

S-Strong-3 M-Medium-2 L-Low-1

OFFICE AUTOMATION (SEC II)

Subject Code	L	T	P	S	Credits	Inst. Hours	Marks		
							CIA	External	Total
	2		2		2	2	25	75	100
Learning Objectives									
LO1	The major objective in introducing the Computer Skills course is to impart training for students in Microsoft Office which has different components like MS Word, MS Excel and Power point.								
LO2	The course is highly practice oriented rather than regular class room teaching.								
LO3	To acquire knowledge on editor, spread sheet and presentation software.								
Prerequisites: Should have studied Commerce in XII Std									
Unit	Contents								No. of Hours
I	Introductory concepts: Hardware and Software - Memory unit – CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems - Introduction to Programming Languages.								
II	Word Processing: File menu operations - Editing text – tools, formatting, bullets and numbering - Spell Checker - Document formatting – Paragraph alignment, indentation, headers and footers, printing – Preview, options, merge.								
III	Spreadsheets: Excel – opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying								
IV	Charts – creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.								
V	Power point: Introduction to Power point - Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition – Animation effects, audio inclusion, timers.								
Total									
Course Outcomes									
CO1	Understand the basics of computer systems and its components.								
CO2	Understand and apply the basic concepts of a word processing package.								
CO3	Understand and apply the basic concepts of electronic spreadsheet software.								
CO4	Understand and apply the basic concepts of database management system.								
CO5	Understand and create a presentation using PowerPoint tool.								
Textbooks									
1	Peter Norton, “Introduction to Computers” –Tata McGraw-Hill.								
Reference Books									
1	Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, “Microsoft 2003”, Tata McGraw- Hill.								
NOTE: Latest Edition of Textbooks May be Used									

Web Resources	
----------------------	--

1	Web content from NDL / SWAYAM or opensource web resources
---	---

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	PHP Programming	Skill Enha. Course (SEC)	2	-	-	-	2	2	25	75	100
Learning Objectives											
LO1	To provide the necessary knowledge on basics of PHP.										
LO2	To design and develop dynamic, database-driven web applications using PHP version.										
LO3	To get an experience on various web application development techniques.										
LO4	To learn the necessary concepts for working with the files using PHP.										
LO5	To get a knowledge on OOPS with PHP.										
UNIT	Contents								No. of Hours		
I	Introduction to PHP -Basic Knowledge of websites -Introduction of Dynamic Website -Introduction to PHP -Scope of PHP - XAMPP and WAMP Installation								6		
II	PHP Programming Basics -Syntax of PHP -Embedding PHP in HTML -Embedding HTML in PHP. Introduction to PHP Variable -Understanding Data Types -Using Operators -Using Conditional Statements -If(), else if() and else if condition Statement.								6		
III	Switch() Statements -Using the while() Loop -Using the for() Loop PHP Functions. PHP Functions -Creating an Array - Modifying Array Elements -								6		
	Processing Arrays with Loops - Grouping Form Selections with Arrays -Using Array Functions.										
IV	PHP Advanced Concepts -Reading and Writing Files -Reading Data from a File.								6		
V	Managing Sessions and Using Session Variables -Destroying a Session -Storing Data in Cookies -Setting Cookies.								6		
	Total								30		
Course Outcomes						Programme Outcomes					
CO	On completion of this course, students will										
CO1	Write PHP scripts to handle HTML forms						PO1, PO4, PO6				
CO2	Write regular expressions including modifiers, operators, and meta characters.						PO2, PO5, PO7.				
CO3	Create PHP Program using the concept of array.						PO3, PO4, PO5.				
CO4	Create PHP programs that use various PHP library functions						PO2, PO3, PO5				
CO5	Manipulate files and directories.						PO3, PO5, PO6.				
Text Book											

1	Head First PHP & MySQL: A Brain-Friendly Guide- 2009-Lynn mighley and Michael Morrison.
2	The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes
Reference Books	
1.	PHP: The Complete Reference-Steven Holzner.
2.	DT Editorial Services (Author), “ <i>HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)</i> ”, Paperback 2016, 2 nd Edition.
3.	P.Rizwan Ahmed, Open Source Programming, Margham Publications, 2018
Web Resources	
1.	Open source digital libraries: PHP Programming
2.	https://www.w3schools.com/php/default.asp

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	1	2	1	2
CO2	3	3	2	2	3	3
CO3	3	3	2	3	3	2
CO4	3	2	3	2	2	3
CO5	3	2	2	2	3	3
Weightage of course contributed to each PSO	15	12	10	11	12	13

S-Strong-3 M-Medium-2 L-Low-1