

	<div>National Institute of Technology Meghalaya</div> <div>An Institute of National Importance</div>												CURRICULUM		
	Programme	Master of Computer Applications								Year of Regulation			2024-25		
Department		Computer Science and Engineering								Semester			II		
	Course Code	Course Name				Pre-Requisite	Credit Structure				Marks Distribution				
L							T	P	C	Continuous Evaluation	Quiz/ Viva	Total			
CA452	Data Structures & Algorithms Lab					0	1	2	2	70	30	100			
							CO's	Statement				Bloom's Taxonomy			
Course Objectives	To develop the student's ability to understand the basic concept of data structure.				Course Outcomes	CA452.1	Able to understand and implement the basic data structure such as array using pointers.				Apply				
						CA452.2	Able to implement and analyse the various types of sorting and searching and algorithms using different data structures for various applications.				Analyse				
						CA452.3	Able to implement using data structure such linked list, stack, queue and analyse which particular data structure will be efficient according to the application.				Analyse				
						CA452.4	Able to implement using nonlinear data structure such as Tree, Graph and analyse which particular data structure will be efficient according to the application.				Analyse				
						CA452.5	Able to understand and implement the various hashing schemes for applications.				Apply				
COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CA452.1	3	2											2		3
CA452.2	3	3	2	2								1	2	2	2
CA452.3	3	3	2	2			2					1	2	3	2
CA452.4	3	3	2	2	2	1	1					1	3	2	2
CA452.5	3	3	2	2	2	1	1					1	2	1	3
CA452	3.00	2.80	2.00	2.00	2.00	1.00	1.33					1.00	2.20	2.00	2.40
SYLLABUS															
No.	Content												Hours	COs	
I	Implement an algorithm to insert and delete an element at any arbitrary position in an array of integer numbers and also implement an algorithm to display the condition of the array before and after insertion.												2	CA452.1	
II	Write a C program to implement sorting of n numbers using a. Bubble sort. b. Selection sort c. Insertion sort. d. Quick sort. e. Merge sort.												6	CA452.2	
III	a. Write a program for addition of two polynomial using linked list. b. Write a program for multiplication of two polynomial using linked list c. Implement algorithms to insert an element in a stack(push), to delete an element from a stack(pop) and to display the elements of the stack.[Assume: initially, top= -1] d. Implement algorithms to insert an element in a queue, to delete an element from a queue and to display the elements of the queue.[Assume: initially, front= -1, rear= -1] e. Implement algorithms to insert an element in a circular queue, to delete an element from a circular queue and to display the elements of the circular queue.[Assume: initially, front= 0, rear= -1] 17.												6	CA452.3	
IV	a. Write a C program to implement searching of a key from n numbers (given in Descending order) using Binary search. b. Write a C program to find a key from n numbers using sequential search (Linear search) & if found, show the position												2	CA452.2	
V	a. Implement a binary tree using array. b. Implement a binary search tree using linked list and traverse in pre- order, in-order and post-order c. Create a binary search tree of N nodes with given N elements and search a given key element. d. Write a C program to implement sorting of n numbers using binary search tree e. Implement an AVL tree.												6	CA452.4	
VI	a. Create a Hash table to store the account number and balance of the customers. Provide proper option to create, search and delete customer details. b. Write a c program to create a file, named "StudentDatabase" . Store the the name, roll number, phone number and average marks of N students, where N is a natural number between 2 to 10. Ex: Sl.No. Name roll number phone number average marks 1. xyz 1234567 9900221188 8.2 After creating database, modify the phone no. and marks of ith student, 1< i < =N												6	CA452.5	
Total Hours												28			

Essential Readings
1. Dr. D.S. Kushwaha, Dr. Arun Kumar Mishra, “A Programming approach with C “, 2 nd Edition, PHI India, 2014.
2. Seymour Lipschutz, “Data Structures”, Revised 1 st Edition, Tata McGraw hill Publication, 2013.
3. Mark Allen Weiss, “Data Structures And Algorithm Analysis In C”, 2nd Edition, Pearson Education, 2002.
Supplementary Readings
1. A.K. Sharma,“Data Structures using C”, Pearson, 2011.
2. Yedidiah Langsam, Aaron M. Tenenbaum, Moshe J. Augenstein, “Data Structures Using C and C++, 2nd Edition, PHI, 2011.
3. Kyle Loudon ,“Mastering Algorithms With C Useful Techniques From Sorting To Encryption”1st Edition, O'Reilly, 2009.