



National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Computer Science and Engineering	Year of Regulation	2019-20
Department	Computer Science and Engineering	Semester	III

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
CS251	Data Structure Lab	0	1	2	2	50	50	100	200

Course Objectives	Course Outcomes	
	To develop the student's ability to understand the basic concept of data structure.	CO1
	To provide the students with various kinds of sorting and searching algorithm required in various applications.	CO2
	To develop the student's ability to implement and analyse the various linear and non-linear data structure applicable to various applications	CO3
	To familiarize the student the various hashing schemes.	CO4
	CO5	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	3	2	0	0	0	0	0	0	0	0	0	0	2	0	3
2	CO2	3	3	2	2	0	0	0	0	0	0	0	1	2	2	2
3	CO3	3	3	2	2	0	0	2	0	0	0	0	1	2	3	2
4	CO4	3	3	2	2	2	1	1	0	0	0	0	1	3	2	2
5	CO5	3	3	2	2	2	1	1	0	0	0	0	1	2	1	3

Suggested List of Experiments

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	CO1
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	CO2
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	CO3
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	CO2
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.	4	CO4
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	4	CO5
Total Hours		24	

Essential Readings

1. Dr. D.S. Kushwaha, Dr. Arun Kumar Mishra, "A Programming approach with C ", 2nd Edition, PHI India, 2014.
2. Seymour Lipschutz, "Data Structures", Revised 1st 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. Yedidyah 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.