NATIONAL OF TECHNOLOGY

National Institute of Technology Meghalaya

CURRICULUM

Progran Departn											Year of Regulation Semester				2024-25 II	
Course		Course Name Pre-Requisi								Credit	Structure Mark			Marks Dis	s Distribution	
Code		Data Structures & Algorithms					FIE	-Nequisite	L L	Т	Р	С	INT		ND	Total
CA402			Data Str	uctures a	& Algoriti	nms			3	0 CO's	0	3 State	50 ement	50 1		200 oom's
	alg	orithms	5.		-	f data struc		cations.	Course Outcomes	CA402.1 CA402.2	Students shall be able to understand of bas concepts of dynamic memory management, data types, algorithms, asymptotic notation and basic data structures. Students shall be able to design, analyze an implement searching and sorting algorithms using different data structures for various			nagement, c notation analyze and algorithms	Understand	
Course Objective	tec					ng algorithm nd writing p		or these		CA402.3	applications. Students shall be able to find the bugs in programs with data structures, formulate solutions and improve in existing code learned algorithms and data structures			bugs in rmulate new code using	Evaluate	
	To	To develop skill for designing, analyzing, correctness and implementing algorithms using various data structures. To implement hashing, linear and nonlinear data structures for real word application as per requirements.								CA402.4 CA402.5	Students shall be able design of algorit representing and implementing nonline structure such as Tree, Graph in real wapplications. Students shall be able to analysis of algorithms of space and time complexities different application using linear and not specification.			algorithm for onlinear data real world of algorithms exities for	S Analyses	
		CA402.6 Students shall be able to underst concepts of hashing schemes, concepts and implement hashing applications.										llision	Understand			
00-						Mapping	with Pro	gram Out	comes (POs	5)	,	- •		Марр	ing with F	SOs
COs	P	01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO
CA402.1		3	2	3	2	2			1	2				3	2	3
CA402.2		2	2	3	3	1		1	1	2	1	2	2	2	3	2
CA402.4		1 2	3	3	3	2	1	2	1	1	1	2	2	2	3	3
CA402.4 CA402.5		2	2	3	3	2	1	1	1	1	1	2	2	3	2	3
CA402.6		2	3	3	2	1	1	1	1	1	1	2	2	3	2	2
CA402	2.	.00	2.50	3.00	2.50	1.67	1.00	1.20	1.17	1.33	1.00	2.00	2.00	2.50	2.33	2.67
									LLABUS					T	T .	
or Remarks	n data eview lanage	Content Con													COs CA402.1, CA402.2	
II pa	nked Lists: Linear linked list, operations on linear linked list, doubly linked list, operations on doubly linked list, oplication of linked lists. acks: Sequential and linked representations, operations on stacks, multi stacks, application of stacks such as arenthesis checker, evaluation of postfix expressions, conversion from infix to postfix representation, implementing cursive functions. ueues: Sequential representation of queue, linear queue, circular queue, operations on linear and circular queue, linked presentation of a queue and operations on it, priority queues, applications of queues.													CA402.2, CA402.3		
III sh	orting & Searching: Sorting arrays using bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, hell sort, tree sort, radix sort, etc., searching an element using linear search and binary search techniques, oncatenation of arrays and merging sorted arrays. leaps: Representing a heap in memory, operations on heaps, application of heap in implementing priority queue and heapsort gorithm.													05	CA402.3, CA402.4	
Tr re bii G i an	rees: E ecursive nary tr raphs nd dept	Basic te procee, three, three Basic the same three Basic	edures, i eaded b terminolo search), a	nserting a inary treesogy, represodding nod	new nod s, AVL tre sentation o	e, deleting es and B- of graphs (a	g a node, trees. djacency r	counting matrix, adj	oversing a bi nodes, findir acency list), t in problems	ng height raversal o	, finding a n f a graph (br	nirror imaç eadth first	ge of a search	11	CA402.4, CA402.5	
	Hashing: Comparing direct address tables with hash tables, hash functions, concept of collision and its resolution using open addressing and separate chaining, double hashing, rehashing													05	CA402.5, CA402.6	
	ddressir	ng and	separate	chaining, c	double has	hing, rehas	hing							03	L C	A4U2.6

- 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.