Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

NAAC

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY
No.173, Agharam Road, Selaiyur, Chennai , T.N - 600 073.

Requisition Letter

Date: 01.12.2021

From
Dr. K.P.Kaliyamurthie,
Professor & Head,
Department of CSE,
Bharath Institute of Higher Education and Research,
Chennai

To
The Dean Engineering,
Bharath Institute of Higher Education and Research,
Chennai

Respected sir

Subject: Request of Permission to conduct a value-added course on **"DATA STRUCTURES"** - Reg

    With reference to above subject, I would like to bring to your kind notice that, our department interested to organize value added course on **"DATA STRUCTURES"** in our campus premises on **12.12.2021**, students would be participating in this course. We request you kindly to give permission to organize this event.

Venue: **CSE Smart Room**

Submitted to Principal for approval to organize this value-added course.

HOD

DEAN ENGINEERING

Bharath
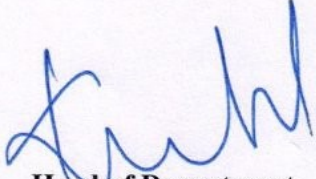## INSTITUTE OF HIGHER EDUCATION AND RESEARCH
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CIRCULAR

07.12.2021

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on **DATA STRUCTURES**for the benefit of II, III and IV year students. This course is scheduled from 12.12.2021 for 30hours which includes theory and practical. The timings are 4:00 PM to 5:00 PM

All Registered Students must attend all the classes without fail. The following faculty members are assigned to handle the course. S.NO	Name of the Faculty	Designation
1	Dr.C.Nalini	Professor
2	Mrs.C.Anuradha	Professor

Head of Department

To

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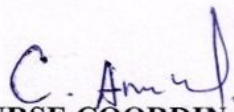
CERTIFICATE COURSE DATA STRUCTURES
Date of Introduction of the Course: 12.12.2021

The timings are

Time Table & Lesson plan

CLASS	DATE	TOPIC
1,2	12.12.2021 13.12.2021	**1. MODULE 1:** Introduction of data Structures, Data Abstraction and Algorithm Analysis, Data types/objects/structures, Abstract definition of data structures, Representation and implementation, Time requirements of algorithms, Space requirements of algorithms.
3,4	14.12.2021 15.12.2021	**2. MODULE 2:** Review of Linear Data Structures, Array application and representation, Polynomials, Sparse matrices, String-pattern Matching.
5,6	16.12.2021 19.12.2021	**3. MODULE 3:** Stack and Queues, Needs and justification of the study of the structures, Representation and implementation, multiple stacks and queues, Implementation of recursion using stack.
7,8	20.12.2021 21.12.2021	**4. MODULE 4:** Linked Lists, Needs for the structure and justification of the study, Representation and Implementation, Doubly linked list, Circular linked list.
9,10	22.12.2021 23.12.2021	**MODULE 5:** Linked list application, Memory Management, Static memory management, Dynamic memory management.
11,12	26.12.2021 27.12.2021	**6. MODULE 6:** Nonlinear Data Structures, Trees, Definitions, terminologies and properties, Binary tree representation, traversals and applications.
13,14	28.12.2021 29.12.2021	**7. MODULE 7:** Threaded binary trees, Binary Search Trees, AVL Trees, M-way Search Trees, B-trees, B*-trees, B+-trees.
		8. MODULE 8:

15,16	30.12.2021 02.01.2022	Optimum binary search trees, Multidimensional binary search tree.
17,18	3.1.2022 4.1.2022	**9. MODULE 9:** Graphs, Definition, terminologies and properties, Graph representations, Minimum spanning trees.
19,20	5.1.2022 6.1.2022	**10. MODULE 10:** The searching techniques using for Depth-first search, Breadth-first search, Networks.
21,22	9.1.2022 10.1.2022	**11. MODULE 11:** The searching techniques using for Priority Queues, Heap Structures, Binomial Heaps, Leftist Heaps.
23,24	11.1.2022 12.1.2022	**12. MODULE 12:** The sorting techniques using for Sort and Search Algorithms, Heap sort, Merge sort, Quick-sort
25,26	19.1.2022 20.1.2022	**13. MODULE 13:** Hashing General radix sort Symbol tables Sequential search, l2021y search, Interpolation search, Tries.
27,28	23.1.2022 24.1.2022	**14. MODULE 14:** XML Parser uses tree algorithms. Decision-based algorithm is used in machine learning which works upon the algorithm of tree. Databases also uses tree data structures for indexing. Domain Name Server (DNS) also uses tree structures.
29,30	25.1.2022 26.1.2022	**15. MODULE 15:** Some applications of a graph are: Facebook's Graph API uses the structure of Graphs. Google's Knowledge Graph also has to do something with Graph. Dijkstra algorithm or the shortest path first algorithm also uses graph structure to finding the smallest path between the nodes of the graph. PS navigation system also uses shortest path APIs.

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

CERTIFICATE COURSE ON DATA STRUCTURES

Date of Introduction of the Course: 12.12.2021

COURSE SYLLABUS

1. MODULE 1:

Introduction of data Structures,Data Abstraction and Algorithm Analysis, Data types/objects/structures, Abstract definition of data structures, Representation and implementation, Time requirements of algorithms, Space requirements of algorithms.

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2. MODULE 2:

Review of Linear Data Structures, Array application and representation, Polynomials, Sparse matrices, String-pattern Matching.

3. MODULE3:

Stack and Queues, Needs and justification of the study of the structures, Representation and implementation, multiple stacks and queues, Implementation of recursion using stack.

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5. MODULE 5:

Linked list application, Memory Management, Static memory management, Dynamic memory management.

6. MODULE 6:

Nonlinear Data Structures, Trees, Definitions, terminologies and properties, Binary tree representation, traversals and applications.

.7. MODULE 7:

Threaded binary trees, Binary Search Trees, AVL Trees, M-way Search Trees, B-trees, B*-trees, B+-trees.

8. MODULE 8:

Optimum binary search trees, Multidimensional binary search tree.

9. MODULE 9:

Graphs, Definition, terminologies and properties, Graph representations, Minimum spanning trees.

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10. MODULE 10:

The searching techniques using for Depth-first search, Breadth-first search, Networks.

11. MODULE 11:

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12. MODULE 12:

The sorting techniques using for Sort and Search Algorithms, Heap sort, Merge sort, Quick-sort

13. MODULE 13:

Hashing General radix sortSymbol tablesSequential search , Binary search, Interpolation search, Tries.

14. MODULE 14:

XML Parser uses tree algorithms. Decision-based algorithm is used in machine learning which works upon the algorithm of tree.Databases also uses tree data structures for indexing. Domain Name Server (DNS) also uses tree structures.

15. MODULE 15:

Some applications of a graph are: Facebook's Graph API uses the structure of Graphs.Google's Knowledge Graph also has to do something with Graph.Dijkstra algorithm or the shortest path first algorithm also uses graph structure to finding the smallest path between the nodes of the graph. PS navigation system also uses shortest path APIs.
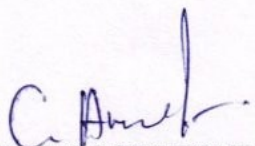
COURSE OBJECTIVES

In this course we plan to give students an overview data structures: data abstraction, a survey of linear data structures, nonlinear data structures, a discussion of more advanced internal and external sort and search algorithms, and the trade-offs involved in the use of different data organizations. The algorithm analysis and trade-offs study shall be done. Implementations and their efficiency in either C or C++ shall be considered in the Lab.

Specifically, the course has the following objectives:

Students will learn

Upon completion of this course students should be able to fully understand and apply the following concepts in their computing related work environment.

1. Data abstraction and information hiding.
2. Linear data structures and their applications in problem solving and programming.
3. Nonlinear data structures and their applications in problem solving and programming.
4. Internal and external sort and search techniques.
5. Graphs, Priority Queues
6. Sort and Search applicationsin problem solving and programming

COURSE COORDINATOR

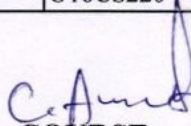**HEAD OF THE DEPARTMENT**
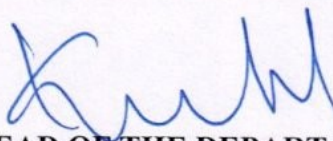
CERTIFICATE COURSE ON DATA STRUCTURES
Date of Introduction of the Course: 12.12.2021
School of Computing
Registered Students Name List

S.NO	REG.NO	NAME OF THE STUDENT
1	U14CS166	SHAFAN HASIM.N
2	U14CS167	SHAIK AATIKA
3	U14CS168	SHAIK MEERA SHARIF
4	U14CS169	SHAIK YASMIN
5	U14CS170	SHANKAR KUMAR GUPTA
6	U14CS006	ABHIKAMALI .A
7	U14CS007	ABHISHEK MANDURI
8	U14CS008	AJAY.D
9	U14CS009	AKASH CHANDRA AMBASTHA
10	U14CS010	AKHIL REDDY.G
11	U14CS011	AKSHAY.R
12	U14CS165	SAURAV SINGH
13	U14CS224	R.SINDHU
14	U14CS228	ELACATI JAGANNADHA HARSHITHA
15	U14CS230	MARAM REDDY RAJASEKHAR
16	U14CS234	DANDU MOHAN RAJENDRA VARMA
17	U15CS055	GOLLAPUDI KALYAN KUMAR
18	U15CS056	GORRE THIRUPATHI REDDY
19	U15CS057	GUJJETI MAHESH
20	U15CS058	GUNDA VINAY KUMAR
21	U15CS121	MD MINHAZ RAZA HASHMI
22	U15CS123	MOHAMMAD ASLAM SHAREEF
23	U15CS124	MOHANKUMAR J
24	U15CS187	SANAYAGARI JAYA CHANDRA REDDY
25	U15CS188	SANDANAMUDI CHANDRA TEJA

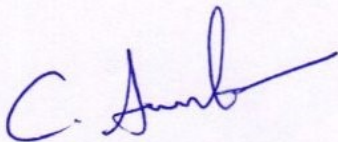| 26	U15CS189	SANTHOSH RAJ M
27	U15CS254	JAGATH RAJAH.R
28	U15CS255	ADITYA
29	U15CS701	PRAVEEN RAJ.V
30	U16CS001	SANTOSH B
31	U16CS002	APARNA V M
32	U16CS003	NALAMOTHU SRIKANTH
33	U16CS004	ABDUL KHADIR L
34	U16CS006	SARAVANAN R
35	U16CS007	SANAM NAGA VENKATA SAI KRISHNA
36	U16CS110	NARRAVULA TEJASREE
37	U16CS111	BODAKUNTLA AKHIL
38	U16CS112	INTURI RAGHU BABU
39	U16CS113	PALLE SUDHEER KUMAR REDDY
40	U16CS114	BANGARAPU MANOJ KUMAR REDDY
41	U16CS115	BHUMIRDDY MAHITHA
42	U16CS116	YELLAPUREDDY REPARENDAR REDDY
43	U16CS171	GOGA VAMSI
44	U16CS172	SEELAM HARITHA SAI PRIYA
45	U16CS173	NALLATI JAYA LAKSHMI DURGA
46	U16CS217	K NIVEDITHA
47	U16CS218	K DIVYA
48	U16CS219	HARINDRA REDDY
49	U16CS220	AFREEN

**COURSE
COORDINATOR**

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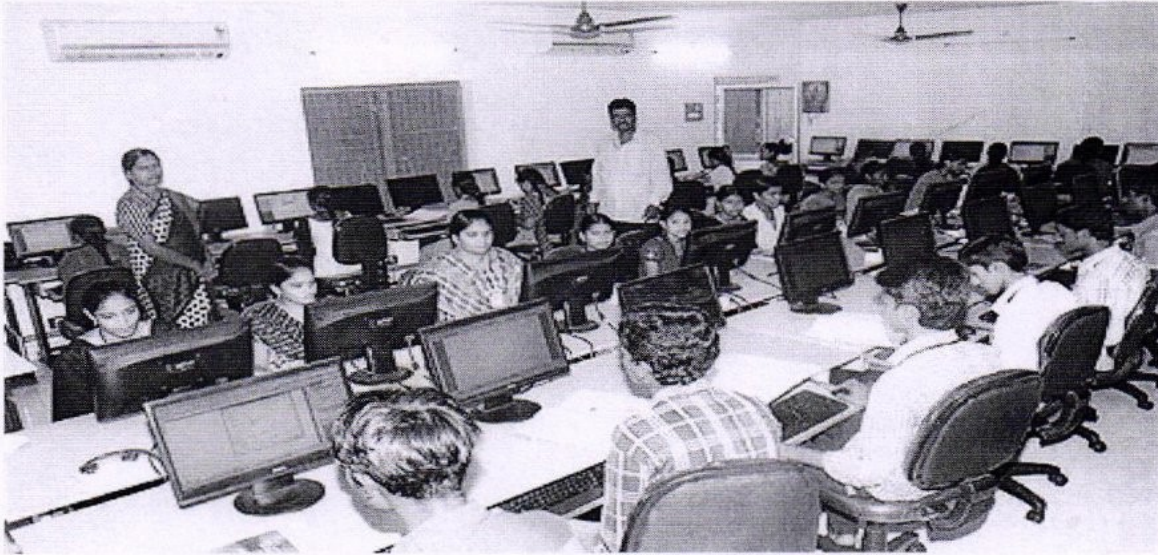
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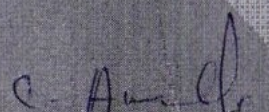
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CERTIFICATE OF PARTICIPATION

This certificate is presented to

K DIVYA(REG NO:U16CS218)

For actively participating in the value added course "DATA STRUCTURES" Conducted by

School of Computing, BIHER from 12.12.2021 to 21.01.2022.

COURSE COORDINATORS

HEAD OF THE DEPARTMENT

DIRECTOR

COURSE FEEDBACK FORM

Academic Year		2021 – 2022						
Term		ODD						
Course Number								
Course Title		Data structures						
Number of Credits		—						
Type of Course	Regular		Elective		Add-on		✓	

I.	Information on the Respondent: (Tick (√) Appropriately)

1.	Percentage of classes attended								
	0-20		20-40		40-60		60-80	✓	80-100	

2.	Number of hours per week spent on the course (Other than lecture hours)								
	0-2		2-4		4-6		6-8		8-10	

3.	Preparation for the course by the student:		
	(i)	Have done part of this course earlier	NO
	(ii)	Has adequate prior exposure to the prerequisites	NO
	(iii)	Had to pickup relevant additional topics through concurrent study	yes
	(iv)	Have no exposure to the background material	NO

4.	The expectations for taking the course by the student are:		
	(a)	Enhance by skill base in the area of specializations	yes
	(b)	Get exposed to a relevant subject	yes
	(c)	Curiosity	yes
	(d)	Better Employment Opportunity	yes
	(e)	Complete Course requirements	yes
	(f)	To Improve CGPA	yes

About the Instructor: Information on the Respondent: (Tick (√) Appropriately)

		A	B	C	D	E
1.	Pace of the Teaching/lecture	✓				
2.	Comment of the Subject	✓				
3.	Clarity of expression	✓				
4.	Level of preparation		✓			
5.	Level of interaction	✓				
6.	Accessibility outside the class		✓			
7.	Others (please specify					

A: Excellent		B: Very Good		C: Good		D: Satisfactory		E: Poor	

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COURSE FEEDBACK FORM

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		A	B	C	D	E
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2.	Comment of the Subject	✓				
3.	Clarity of expression	✓				
4.	Level of preparation		✓			
5.	Level of interaction	✓				
6.	Accessibility outside the class		✓			
7.	Others (please specify					

A: Excellent		B: Very Good		C: Good		D: Satisfactory		E: Poor	

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