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

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

Requisition Letter

From   Date: 08.06.2022
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 and Algorithms Specialization**" -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 and Algorithms Specialization**" in our campus premises on **16/06/2022**.

35 students would be participating in this course. We request you kindly to give permission to organize this event.

Venue: **CSE Smart Room**

Timing : **9 am to 4.30 pm**

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

HOD/CSE   **DEAN ENGINEERING**

HEAD OF DEPARTMENT
Department of Computer Science & Engg.,
Bharath Institute of Higher Education & Research
(Declared as Deemed to be University U/S 3 of UGC Act, 1956)
Chennai-600 073. INDIA

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

CIRCULAR

12.06.2022

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on **DATA STRUCTURES AND ALGORITHMS SPECIALIZATION** for the benefit of II, III and IV year students. This course is scheduled from 16.06.2022 for 30hours which includes theory and practical. The timings are 3:00 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	E.Fathima	Assistant Professor
2	C.Rajabhushanam	Assistant Professor

Head of Department

To

Copy to CSE

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CERTIFICATE COURSE ON DATA STRUCTURES AND ALGORITHMS SPECIALIZATION

Date of Introduction of the Course:16.06.2022

COURSE SYLLABUS

1.INTRODUCTION TO OOPS

Introduction to object oriented programming through stacks, queues and linked lists.

2.HASHING TECHNIQUES

Dictionaries: skip-lists, hashing, analysis of collision resolution techniques.

3.TREES

Trees, traversals, binary search trees, optimal and average.

4.BINARY SEARCH TREE

BST's trees and red-black trees.

5.QUEUE

Tries and pattern matching. Priority queues and binary heaps.

6.SORTING AND SELECTION

Sorting: merge, quick, radix, selection, heap.

7.BFS

Introduction to Graphs, Breadth first search and connected components.

8. DFS

Depth first search in directed and undirected graphs and strongly connected components.

9.SPANNING TREES

Prim's and Kruskal's algorithm, union-find datastructure.

10. ACYCLIC GRAPHS

Dijkstra's algorithm for shortest path. shortest path tree. Shortest and longest paths in directed acyclic graphs.

11. GRAPHS

Matrix Representation of Graphs, List Structures, Other Representations of Graphs, Breadth First Search, Depth First Search, Spanning Trees.

12. DIRECTED GRAPHS

Types of Directed Graphs; Binary Relation As a Digraph; Euler's Digraphs; Matrix Representation of Digraphs.

13. SORTING

Divide and Conquer Divide and Conquer Strategy; Binary Search; Max. And Min.; Merge sort; Quick sort.
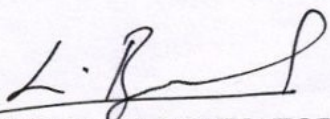
14. GREEDY ALGORITHM

Greedy Method Greedy Method Strategy; Optimistic Storage on Tapes; Knapsack Problem; Job Sequencing with Deadlines; Optimal Merge Pattern; Single Source Shortlist Paths.

15. DYNAMIC PROGRAMMING

Dynamic Programming Strategy; Multistage Graphs; All Pair Shortest Paths; Travelling Salesman Problems.

Course Objective:

1. To understand the various algorithm design and analysis techniques
2. To learn tree data structures – lists, stacks, and queues
3. To learn different sorting and searching algorithms
4. To understand Tree and Graph data structures
5. To learn Greedy algorithms and Dynamic programming

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

CERTIFICATE COURSE ON DATA STRUCTURES AND ALGORITHMS SPECIALIZATION

Date of Introduction of the Course:16.06.2022

The timings are 3 PM to 5 PM from Friday (AN) and Saturday (FN&AN).

Time Table& Lesson plan

CLASS	DATE	TOPIC
1,2	16-06-2022(AN)	**1.INTRODUCTION TO OOPS** Introduction to object oriented programming through stacks, queues and linked lists.
3,4	17-06-2022(FN)	**2.HASHING TECHNIQUES** Dictionaries: skip-lists, hashing, analysis of collision resolution techniques.
5,6	17-06-2022(AN)	**3.TREES** Trees, traversals, binary search trees, optimal and average.
7,8	23-06-2022(AN)	**4.BINARY SEARCH TREE** BST's trees and red-black trees.
9,10	24-06-2022(FN)	**5.QUEUE** Tries and pattern matching. Priority queues and binary heaps.
11,12	24-06-2022(AN)	**6.SORTING AND SELECTION** Sorting: merge, quick, radix, selection, heap.
13,14	30-06-2022(AN)	**7.BFS** Introduction to Graphs, Breadth first search and connected components.

15,16	01-07-2022(FN)	**8. DFS** Depth first search in directed and undirected graphs and strongly connected components
17,18	01-07-2022 (AN)	**9.SPANNING TREES** Prim's and Kruskal's algorithm, union-find datastructure.
19,20	07-07-2022 (AN)	**10. ACYCLIC GRAPHS** Dijkstra's algorithm for shortest path. shortest path tree. Shortest and longest paths in directed acyclic graphs.
21,22	08-07-2022 (FN)	**11. GRAPHS** Matrix Representation of Graphs, List Structures, Other Representations of Graphs, Breadth First Search, Depth First Search, Spanning Trees.
23,24	08-07-2022 (AN)	**12. DIRECTED GRAPHS** Types of Directed Graphs; Binary Relation As a Digraph; Euler's Digraphs; Matrix Representation of Digraphs.
25,26	14-07-2022 (AN)	**13. SORTING** Divide and Conquer Divide and Conquer Strategy; Binary Search; Max. And Min.; Merge sort; Quick sort.
27,28	15-07-2022(FN)	**14. GREEDY ALGORITHM** Greedy Method Greedy Method Strategy; Optimistic Storage on Tapes; Knapsack Problem; Job Sequencing with Deadlines; Optimal Merge Pattern; Single Source Shortlist Paths.
29,30	15-07-2022(AN)	**15. DYNAMIC PROGRAMMING** Dynamic Programming Strategy; Multistage Graphs; All Pair Shortest Paths; Travelling Salesman Problems.

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

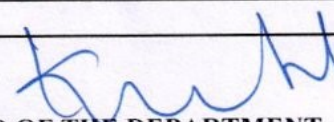## CERTIFICATE COURSE ON DATA STRUCTURES AND ALGORITHMS SPECIALIZATION

Date of Introduction of the Course: 16.06.2022
School of Computing
Registered Students Name List

S.NO	REG.NO	NAME OF THE STUDENT
1	U14CS035	BYSANI VENKAT SANDEEP
2	U14CS090	MAL REDDY GANESH REDDY
3	U14CS151	RAVIPATI SUBBARAYUDU
4	U14CS153	RONU SHARMA
5	U14CS155	TAMMINANA SAGAR
6	U14CS157	SAJJA. SURENDRA PRASAD
7	U14CS166	SHAFAN HASIM.N
8	U14CS170	SHANKAR KUMAR GUPTA
9	U14CS178	SK MD TAUQEER
10	U14CS181	SOURABH PRIYADARSHI
11	U14CS185	SURENDAR.K
12	U14CS199	VAMMARVALLI RAJA
13	U14CS207	VIVEK KUMAR
14	U14CS210	YELLALA SANTHOSH REDDY
15	U15CS144	OMPRAKASH YADAV
16	U15CS147	PALEPU SIVA MANIKANTA CHARI
17	U15CS148	PARTHIBAN S
18	U15CS710	JAYANTHI..S
19	U15CS194	SHAIK SABIR
20	U15CS196	SHARYARAI.S
21	U15CS197	SHATRUGHAN SUHAN.S
22	U15CS201	SMITHA C.S
23	U15CS255	ADITYA
24	U15CS701	PRAVEEN RAJ.V
25	U15CS502	DANIEL BRITTO
26	U15CS702	GOWTHAMAN.S
27	U16CS025	SANTHOSHKUMAR S
28	U16CS099	GANGUMALLA GANGA SUNIL
29	U16CS101	NITHISHVAR S
30	U16CS152	NALLAPU RAJESH
31	U16CS162	YEMIREDDY SRINIVASA REDDY
32	U16CS169	RAVILLA HARSHITHA
33	U16CS192	GANTLA VASU
34	U16CS197	PRAVEENRAJ R M
35	U16CS210	TANIRU SATISH

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

CERTIFICATE COURSE ON DATA STRUCTURES AND ALGORITHMS SPECIALIZATION

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

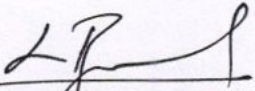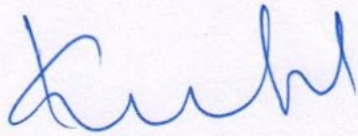# Bharath

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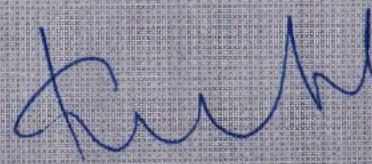TO THE STARS BY HARD WORK

BIHER UNIVERSITY
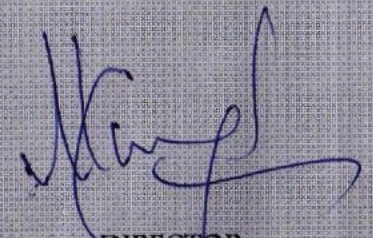
INDIA

CERTIFICATE OF PARTICIPATION

This certificate is presented to

S.NITHISTVAR (REG NO:U16CS101)

For actively participating in the value added course "DATA STRUCTURES AND ALGORITHMS SPECIALIZATION" Conducted by School of Computing, BIHER from 16.06.2022 to 15.07.22

COURSE COORDINATORS

HEAD OF THE DEPARTMENT

DIRECTOR

COURSE FEEDBACK FORM

Academic Year	2022
Term	Odd Sem
Course Number	
Course Title	Data Structures and Algorithms Specialization
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	yes
(ii)	Has adequate prior exposure to the prerequisites	yes
(iii)	Had to pickup relevant additional topics through concurrent study	yes
(iv)	Have no exposure to the background material	yes

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	

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	

HEAD OF THE DEPARTMENT

COURSE FEEDBACK FORM

Academic Year	2022
Term	Odd Sem
Course Number	
Course Title	Data Structures & algorithm Specialization
Number of Credits	

Type of Course	Regular		Elective		Add-on	✓

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

1. **Percentage of classes attended**

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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	

HEAD OF THE DEPARTMENT