



**Requisition Letter**

Date:13.02.2019

From  
Dr. K.P.Kaliyamurthi,  
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

able Data Science” -

Subject:Request of Permission to conduct a value-added course on “Scalable Data Science” -  
Reg

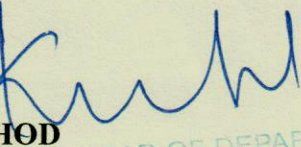
kind notice that, our  
“Scalable Data Science” in our campus  
request you kindly to

With reference to above subject, I would like to bring to your  
department interested to organize value added course on “Scalable Data Science”  
premises on **22.02.2019**. students would be participating in this course. We  
give permission to organize this event.

Venue: **CSE Smart Room**

Timing 1:30 PM to 4:30 PM Friday(AN) and Saturday (FN&AN).

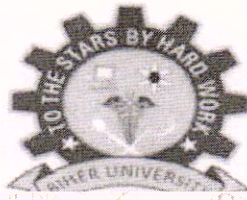
Submitted to Principal for approval to organize this value-added course.

  
HOD

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



**DEAN ENGINEERING**



# Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH

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## CIRCULAR

18.2.2019

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on Scalable Data Science for the benefit of III<sup>rd</sup> and IV<sup>th</sup> year students. This course is scheduled from 22.2.2019 for 30 hours which includes theory and practical. The timings are 1:30 PM to 4:30 PM from Friday (AN) and Saturday (FN&AN)

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

  
Head of Department

To

Copy to CSI

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HEAD OF DEPARTMENT  
Department of Computer Science  
Bharath Institute of Higher Education and Research  
General Office, Bharath University, Chennai  
Phone: 4350 113, 24064

CERTIFICATE COURSE ON SCALABLE DATA SCIENCE

Date of Introduction of the Course: 22.02.2019

COURSE SYLLABUS

Module 1

Background: Introduction, Probability: Concentration inequalities, Linear algebra: PCA, SVD, Optimization: Basics, Convex, GD, Machine Learning: Supervised,

generalization, feature learning, clustering.

2) Module 2

Memory-efficient data structures: Hash functions, universal / perfect  
Bloom filters Sketches for distinct count Misra-Gries sketch.

3) Module 3

Memory-efficient data structures (contd.): Count Sketch, Count-Min Sketch  
Approximate near neighbors search: Introduction, kd-trees etc. LSH families  
MinHash for Jaccard, SimHash for L2

4) Module 4

Approximate near neighbors search: Extensions e.g. multi-probe, b-bit  
Data dependent variants, Randomized Numerical Linear Algebra Random

5) Module 5

Randomized Numerical Linear Algebra CUR Decomposition Sparse RP

RP, Kitchen Sink

6) Module 6

Map-reduce and related paradigms Map reduce - Programming examples - (page  
rank, k-means, matrix multiplication) Big data: computation goes to data. + Hadoop  
ecosystem

7) Module 7

Map-reduce and related paradigms (Contd.) Scala + Spark Distributed Machine

Learning and Optimization: Introduction SGD + Proof

8) Module 8

Distributed Machine Learning and Optimization: ADMM + applications, Clustering

9) Module 9

Project

## COURSE OBJECTIVES

In this course we plan to give students an overview of the field of Scalable data science, and in-depth study into its enabling technologies and main building blocks. Students will gain hands-on experience solving relevant problems through projects. It is our objective that students will develop the skills needed to become a practitioner or carry out research projects in this domain.

Specifically, the course has the following objectives:

### Students will learn

What data science is, the various activities of a data scientist's job, and methodology to work like a data scientist.

How various machine learning techniques and Map-Reduce methods

Understand Memory-efficient data structures

Apply various data science skills, techniques, and tools.

1) W  
think

2) K

3) U

4) A

HEAD OF THE DEPARTMENT

COURSE COORDINATOR

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

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Bharath  
(Declared a



# Bharath



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## CERTIFICATE COURSE ON SCALABLE DATA SCIENCE

Date of Introduction of the Course: 22.02.2019

The timings are 1:30 PM to 4:30 PM from Friday (AN) and Saturday (FN & AN)

### Time Table & Lesson plan

CLASS	DATE	TOPIC
1,2	22.02.2019 (AN)	1. Module 1 Background: Introduction, Probab Concentration inequalities, Linear algebra: I SVD, Optimization: Basics. Convex.
		Machine Learn feature learning
	3,4	23-02-2019] (FN)
		2. Module 2 Memory-efficient universal / per Sketches for dis
	5,6	24-02-2019]
		3. Module 3 Sketches for dis

ility:  
CA,  
GD.

ing: Supervised, generalization,  
, clustering.

nt data structures: Hash functions,  
fect hash families Bloom filters  
tinct count Misra-Gries sketch.

13,14	08-03-2019	5.Module 5 Randomized Numerical Linear Algebra CUR Decomposition Sparse PP, Subspace PP, Krishner (AN)		
15,16	09-03-2019 (FN)	6.Module 6 Map-reduce and related paradigms Map Programming examples - (pagerank, matrix multiplication) Big data: c goes to data. + Hadoop ecosystem		
17,18	11,18	09-03-2019 (AN)	6.Module 6 Map-reduce Programming matrix mu goes to data	
19,20	15-03-2019 (AN)	7.Module 7 Map-reduce + Spark		
		Optimization: Introduction SGD + Proof		
16-03-2019 (FN)		7.Module 7 Map-reduce and related paradigms (Contd.) Scala + Spark Distributed Machine Learning and Optimization: Introduction SGD + Proof		21,22
16-03-2019 (AN)		7.Module 7 Map-reduce and related paradigms (Contd.) Scala + Spark Distributed Machine Learning and Optimization: Introduction SGD + Proof		23,24
	25-03-2019 (FN)	8.Module 8 Distributed Machine Learning and Optimization: ADMM + applications, Clustering		
29,30	23-03-2019 (AN)	9. Module 9 Project		

*Chaitanya*  
COURSE COORDINATOR

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



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## CERTIFICATE COURSE ON SCALABLE DATA SCIENCE

Date of Introduction of the Course: 22.02.2019

## School of Computing

### Registered Students Name List

REG.NO	NAME OF THE STUDENT
U15CS101	KOTNANI KRISHNA VAMSI
U15CS102	KRISHNA KUMAR YADAV
U15CS104	KUNISETTY JYOTHSNA

LALJEE
LINGAMPELLY SANNITH REDDY
LOHESH WARAN S
M SHIVA PRAKASH
M UTTEJ
M. DINESH REDDY

10	U15CS111	M.YESHWITHA REDDY
11	U15CS204	SUBHAM RAY
12	U15CS205	SUDALAGUNTA GOPI
13	U15CS206	SUJIT KRISHNA KUMAR K
14	U15CS207	SWARNA LAKSHMI PRIYANKA
15	U15CS208	TAGORE S

S.NO
1
2
3

4	U15CS105
5	U15CS106
6	U15CS107
7	U15CS108
8	U15CS109
9	U15CS110

21	U16CS008	CHITMIREDDIGARI ANKITHAREDDY
22	U16CS009	RITIK RAJ
23	U16CS010	JOHAN KIRUBHAHAR P.P
24	U16CS011	RAVURI MOUNIKA

25	U16CS012	FAYAZ AKIL S
26	U16CS013	SURYA SUNDARRAI SRIBAMA

27	U16CS014	SOMA BHARATH KUMAR
28	U16CS015	B J JAISON
29	U16CS016	SARAVANAKUMAR S
30	U16CS017	VARUN KANNA A
31	U16CS704	HARISH KUMAR

32	U16CS705	PRANIKSHA RAJESHPUJARI
33	U16CS706	GANESH SAI
34	U16CS707	HANUMANTHU RAO
35	U16CS708	SIMRAN ALIZA NISAR

*C. Nandan*  
**COURSE COORDINATOR**

*[Signature]*  
**HEAD OF THE DEPARTMENT**

**HEAD OF DEPARTMENT**  
 Department of Computer Science & Engg.,  
 Bharath Institute of Higher Education & Research  
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 Chennai-600 073. INDIA





# Shaheed

INSTITUTE OF HIGHER EDUCATION AND RESEARCH  
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This certificate is presented to

**Dr. Anshu K. Singh**

**Assistant Professor**

**Department of English**

**Shaheed Institute of Higher Education and Research**

**Shaheed, Meerut**

**U.P. 20136**

**2023**

**Shaheed Institute of Higher Education and Research**

**Shaheed, Meerut**

**U.P. 20136**

**2023**

**Shaheed Institute of Higher Education and Research**

**Shaheed, Meerut**

**U.P. 20136**

**2023**

# COURSE FEEDBACK FORM

Academic Year	2019-2020
Term	Even

Course Number			
Course Title		Scalable Data Science	
Number of Credits			
Type of Course	Regular	Elective	Add-on <input checked="" type="checkbox"/>

**Information on the Respondent: (Tick (✓) Appropriately)**

✓	1.	<b>Percentage of classes attended</b>								
		0-20		20-40		40-60		60-80	✓	80-100
	2.	<b>Number of hours per week spent on the course (Other than lecture hours)</b>								
		0-2		2-4		4-6		6-8		8-10

Did you do any self study	No
	No
	Yes
	No

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

Did you have any expectations	Yes
	Yes
	Yes
	Yes

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

<b>Information on the Respondent: (Tick (✓) Appropriately)</b>			
	C	D	E

<b>About the Instructor: Information on the Respondent: (Tick (✓) Appropriately)</b>			
		A	B
1.	Pace of the Teaching/lecture	✓	
2.	Comment of the Subject	✓	




**DEPARTMENT**  
 DEPARTMENT  
 Computer Science & Engg.,  
 Higher Education & Research  
 University U/S 3 of UGC Act, 1956  
 600 073. INDIA

**HEAD OF THE**  
 HEAD OF  
 Department of Co  
 Bharath Institute of  
 (Declared as Deemed to b  
 Chennai

# COURSE FEEDBACK FORM

Academic Year	2019-2020
Term	Even

Name of the Respondent (Tick (✓) Appropriately)

Number of classes attended						
20-40	40-60	60-80	✓	80-100		
Number of hours per week spent on the course (Other than lecture hours)						
2-4	4-6	6-8		8-10	✓	

<b>Information for the course by the student:</b>	
Have done part of this course earlier	No
Has adequate prior exposure to the prerequisites	No
Had to pickup relevant additional topics through concurrent study	Yes
Have no exposure to the background material	No

<b>Reasons for taking the course by the student are:</b>	
Enhance by skill base in the area of specializations	Yes
Get exposed to a relevant subject	Yes
Curiosity	Yes
Better Employment Opportunity	Yes

	Yes
	Yes
	Yes
	Yes

(Tick (✓) Appropriately)				
	B	C	D	E
Subject	✓			
Revision	✓			
Revision			✓	
Revision	✓			
Outside the class			✓	
Specify				

A: Very Good	C: Good	D: Satisfactory	E: Poor
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**HEAD OF THE DEPARTMENT**

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 Department of Computer Sci. & Engg.  
 Bharath Institute of Higher Education & Research  
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Chennai-600 075, INDIA

1.	Percentage	0-20
2.	Number	0-2

3.	Preparation	(i) (ii) (iii) (iv)
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4.	The expectations	(a) (b) (c) (d)
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	(e)	Complete Course requirements
	(f)	To Improve CGPA

<b>About the Instructor: Information on the Respondent: (Tick (✓) Appropriately)</b>		
	A	
1.		Pace of the Teaching/lecture
		✓

2.	Comment of the
3.	Clarity of expression
4.	Level of preparation
5.	Level of interaction
6.	Accessibility of the course
7.	Others (please specify)

A: Excellent	B: Very Good
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CERTIFICATE COURSE ON SCALABLE DATA SCIENCE

CER



COURSE COORDINATOR

*K. S. S. S.*

HEAD OF DEPARTMENT  
DEPARTMENT OF COMPUTER SCIENCE  
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Chennai-600 073, INDIA