Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH

(Declared as Deemed-to-be University under section 3 of UGC Act 1956)

CIRCULAR

26.09.2017

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on **IBM DATA SCIENCE** for the benefit of II, III and IV year students. This course is scheduled from 26.9.2017 for 30 hours which includes theory and practical. The timings are 9AM to 12PM and 1:30 PM to 4:30 PM on Friday (AN) and Saturday (FN&AN).

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	Dr.C.Rajabhushanam	Professor

Head of Department

To

Copy to CSE

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

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CERTIFICATE COURSE ON IBM DATA SCIENCE

Date of Introduction of the Course: 26.09.2017

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	26-09-2017(FN) 26-09-2017(AN)	**1. Introduction to Data Science** Definition of data science and what data scientists do, Tools and algorithms, Skills needed to be a successful data scientist, The role of data science within a business.
3,4	01-10-2017 (AN)	**2. Data Science Tools** Data science and Data visualization tools, Jupyter Notebooks including its features, Popular tools used by R Programmers, IBM Watson Studio including its features and capabilities, create and share a Jupyter Notebook.
5,6	02-10-2017(FN) 02-10-2017(AN)	**3. Data Science Method** Understanding and preparing the data, practice data science, including forming a concrete business question or research.
7,8	08-10-2017 (AN)	**4. SQL for Data Science** Foundational knowledge of the SQL language, create a database in the cloud, string patterns and ranges to query data, sort and group data in result sets and by data type, analyze data using Python.
9,10	09-10-2017 (FN) 09-10-2017 (AN)	**5. Python Basics for Data Science - I** Python Basics - Types, Expressions and Variables, String Operations, Python Data Structures - Lists and Tuples, Sets, Dictionaries, Python Programming Fundamentals - Conditions and Branching, Loops, Functions, Objects and Classes
11,12	15-10-2017 (AN)	**6. Python Basics for Data Science – II** Working with Data in Python - Reading files with open, Writing files with open, Loading data with Pandas, Working with and Saving data with Pandas, Working with Numpy Arrays - Numpy 1d Arrays, Numpy 2d Arrays.

13,14	**16-10-2017 (FN) 16-10-2017 (AN)**	**7. Analyzing Data with Python – I** Importing Datasets - Understanding the Dataset, Python package for data science, Importing and Exporting Data in Python, Basic Insights from Datasets, Cleaning and Preparing the Data, Summarizing the Data Frame - Descriptive Statistics, Basic of Grouping, ANOVA, Correlation.
15,16	**22-10-2017 (AN)**	**8. Analyzing Data with Python – II** Model Development - Simple and Multiple Linear Regression, Model Evaluation using Visualization, Polynomial Regression and Pipelines, R-squared and MSE for In-Sample Evaluation, Prediction and Decision Making, Model Evaluation - Over-fitting, Under-fitting and Model Selection, Ridge Regression, Grid Search, Model Refinement
17,18	**23-10-2017 (FN) 23-10-2017 (AN)**	**8. Analyzing Data with Python – II** Model Development - Simple and Multiple Linear Regression, Model Evaluation using Visualization, Polynomial Regression and Pipelines, R-squared and MSE for In-Sample Evaluation, Prediction and Decision Making, Model Evaluation - Over-fitting, Under-fitting and Model Selection, Ridge Regression, Grid Search, Model Refinement
19,20	**29-10-2017 (AN)**	**9. Visualizing Data with Python** Introduction to Visualization Tools, Basic Visualization Tools - Area Plots, Histograms, Bar Charts, Specialized Visualization Tools - Pie Charts, Box Plots, Scatter Plots, Bubble Plots, Advanced Visualization Tools - Waffle Charts, Word Clouds, Seaborn and Regression Plots, Creating Maps and Visualizing Geospatial Data.
21,22	**30-10-2017 (FN) 30-10-2017 (AN)**	**9. Visualizing Data with Python** Introduction to Visualization Tools, Basic Visualization Tools - Area Plots, Histograms, Bar Charts, Specialized Visualization Tools - Pie Charts, Box Plots, Scatter Plots, Bubble Plots, Advanced Visualization Tools - Waffle Charts, Word Clouds, Seaborn and Regression Plots, Creating Maps and Visualizing Geospatial Data.
23,24	**06-11-2017 (AN)**	**10. Machine Learning with Python – I** Introduction to Machine Learning - Applications of Machine Learning, Supervised vs Unsupervised Learning, Python libraries suitable for Machine Learning, Regression - Linear Regression, Non-linear Regression, Model evaluation methods.
25,26	**07-11-2017 (FN) 07-11-2017 (AN)**	**10. Machine Learning with Python – I** Introduction to Machine Learning - Applications of Machine Learning, Supervised vs Unsupervised Learning, Python libraries suitable for Machine Learning, Regression - Linear Regression, Non-linear Regression, Model evaluation methods.

27,28	**13-11-2017 (AN)**	**11. Machine Learning with Python – II** Classification – K-Nearest Neighbour, Decision Trees, Logistic Regression, Support Vector Machines, Model Evaluation, Unsupervised Learning - K-Means Clustering, Hierarchical Clustering, Density-Based Clustering, Recommender Systems - Content-based recommender systems, Collaborative Filtering.
29,30	**14-11-2017 (FN)** **14-11-2017 (AN)**	**11. Machine Learning with Python – II** Classification – K-Nearest Neighbour, Decision Trees, Logistic Regression, Support Vector Machines, Model Evaluation, Unsupervised Learning - K-Means Clustering, Hierarchical Clustering, Density-Based Clustering, Recommender Systems - Content-based recommender systems, Collaborative Filtering.

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

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CERTIFICATE COURSE ON IBM DATA SCIENCE

Date of Introduction of the Course: 26.09.2017

COURSE SYLLABUS

1. Introduction to Data Science

Definition of data science and what data scientists do, Tools and algorithms, Skills needed to be a successful data scientist, The role of data science within a business.

2. Data Science Tools

Data science and Data visualization tools, Jupyter Notebooks including its features, Popular tools used by R Programmers, IBM Watson Studio including its features and capabilities, create and share a Jupyter Notebook.

3. Data Science Method

Understanding and preparing the data, practice data science, including forming a concrete business question or research.

4. SQL for Data Science

Foundational knowledge of the SQL language, create a database in the cloud, string patterns and ranges to query data, sort and group data in result sets and by data type, analyze data using Python.

5. Python Basics for Data Science - I

Python Basics - Types, Expressions and Variables, String Operations, Python Data Structures - Lists and Tuples, Sets, Dictionaries, Python Programming Fundamentals - Conditions and Branching, Loops, Functions, Objects and Classes

6. Python Basics for Data Science – II

Working with Data in Python - Reading files with open, Writing files with open, Loading data with Pandas, Working with and Saving data with Pandas, Working with Numpy Arrays - Numpy 1d Arrays, Numpy 2d Arrays.

7. Analyzing Data with Python – I

Importing Datasets - Understanding the Dataset, Python package for data science, Importing and Exporting Data in Python, Basic Insights from Datasets, Cleaning and Preparing the Data, Summarizing the Data Frame - Descriptive Statistics, Basic of Grouping, ANOVA, Correlation.

8. Analyzing Data with Python – II

Model Development - Simple and Multiple Linear Regression, Model Evaluation using Visualization, Polynomial Regression and Pipelines, R-squared and MSE for In-Sample Evaluation, Prediction and Decision Making, Model Evaluation - Over-fitting, Under-fitting and Model Selection, Ridge Regression, Grid Search, Model Refinement

9. Visualizing Data with Python

Introduction to Visualization Tools, Basic Visualization Tools - Area Plots, Histograms, Bar Charts, Specialized Visualization Tools - Pie Charts, Box Plots, Scatter Plots, Bubble Plots, Advanced Visualization Tools - Waffle Charts, Word Clouds, Seaborn and Regression Plots, Creating Maps and Visualizing Geospatial Data.

10. Machine Learning with Python – I

Introduction to Machine Learning - Applications of Machine Learning, Supervised vs Unsupervised Learning, Python libraries suitable for Machine Learning, Regression - Linear Regression, Non-linear Regression, Model evaluation methods.

11. Machine Learning with Python – II

Classification – K-Nearest Neighbour, Decision Trees, Logistic Regression, Support Vector Machines, Model Evaluation, Unsupervised Learning - K-Means Clustering, Hierarchical Clustering, Density-Based Clustering, Recommender Systems - Content-based recommender systems, Collaborative Filtering.

COURSE OBJECTIVES

In this course we plan to give students an overview of the field of IBM Data Science, and an in-depth study into its enabling technologies and main building blocks. Students will gain hands-on experience solving relevant problems through projects that will utilize existing public data science tools. 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

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

2) Develop hands-on skills using the tools, languages, and libraries used by professional data scientists.

3) Import and clean data sets, analyze and visualize data, and build and evaluate machine learning models and pipelines using Python.

4) Apply various data science skills, techniques, and tools.

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CERTIFICATE COURSE ON IBM DATA SCIENCE
Date of Introduction of the Course: 26.9.2017

School of Computing
Registered Students Name List

S.NO	REG.NO	NAME OF THE STUDENT
1	U14CS027	BALAJI SINGH. T
2	U14CS028	BALAJI.S
3	U14CS029	BALAKRISHNAN.T
4	U14CS031	BISHAL BANIK
5	U14CS032	BODA VEERA VENKATA RAVI TEJA
6	U14CS033	BOORAGADDA VAMSI KRISHNA
7	U14CS034	BOYAPATI VINAY
8	U14CS035	BYSANI VENKAT SANDEEP
9	U14CS036	CHARAN.G
10	U14CS038	CHIDIRALA.SAI SHANKAR
11	U14CS011	AKSHAY.R
12	U15CS117	MANOJ KUMAR R
13	U15CS118	MANUGUNTA BHARGAVI
14	U15CS119	MARRIBOYINA GOVARDHAN YADAV
15	U15CS120	MARRIPUDI KRISHNA CHAITANYA
16	U15CS121	MD MINHAZ RAZA HASHMI
17	U15CS123	MOHAMMAD ASLAM SHAREEF
18	U15CS124	MOHANKUMAR J
19	U15CS125	MOLAPANTI SIVA KALPANA
20	U15CS126	MOORABOINA NARESH
21	U15CS704	KARAM
22	U15CS010	DIVYA
23	U15CS505	C.KOUSHIK
24	U15CS149	P.KHAJA KHAN
25	U16CS144	NAVEEN BALAJI P

26	U16CS146	MANDALAPU VENGALA REDDY
27	U16CS147	PREM KUMAR MISHRA
28	U16CS148	THANUBUDDI RAJASHEKAR REDDY
29	U16CS149	SUDIREDDY MUKESH REDDY
30	U16CS150	SHAIK NAGUL MEERAVALI
31	U16CS151	PODAPATI ASMITHA
32	U16CS152	NALLAPU RAJESH
33	U16CS153	GANGISETTI MANEESHA
34	U16CS154	MANGALURE KISHOR KUMAR
35	U16CS155	JEFFRIN RAJAN M
36	U16CS156	RIK ROY
37	U16CS157	MOKA BALAJI VARMA
38	U16CS158	NIMBAGALLU KURUBA GURUMURTHY
39	U16CS159	JANA ARAVIND KUMAR
40	U16CS160	NARLA RAJESH
41	U16CS161	BIJJAM THIRUPATHI REDDY
42	U16CS162	YEMIREDDY SRINIVASA REDDY
43	U16CS163	DAKA AKSHUTH KUMAR
44	U16CS164	MANDAVA MANOJ
45	U16CS165	MEKALA PANDU PREM KUMAR
45	U14CS105	MOOTHI LAKSHMI PRASANNA
46	U14CS106	MUGANTH.R.
47	U14CS107	MUGUNTHANATHAN.G
48	U14CS108	MURALI .S
49	U14CS109	N.UMA VENKATA MAHESHWARA SWAMY
50	U15CS220	VIGNESH KUMAR R.J
51	U15CS221	VIGNESHWARAN.M
52	U15CS225	VINOTHKUMAR.J
53	U15CS226	VUNDAVELLI VEERA VENKATA SATYANARAYANA
54	U15CS227	VUPPALA SUJITH
55	U15CS058	GUNDA VINAY KUMAR
56	U15CS059	HANUMAN B
57	U15CS060	HARI HARAN M
58	U15CS061	HASTHI RUCHITHA

59	U15CS062	HEMA NARAYANAN R
60	U16CS006	SARAVANAN R
61	U16CS007	SANAM NAGA VENKATA SAI KRISHNA
62	U16CS008	CHEEMIREDDIGARI ANKITHAREDDY
63	U16CS009	RITIK RAJ
64	U16CS010	JOHAN KIRUBHAHAR P P

COURSE COORDINATOR

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CERTIFICATE OF PARTICIPATION

This certificate is presented to

CHARAN

For actively participating in the value added course "IBM DATA SCIENCE"
Conducted by School of Computing, BIHER from 26.09.2017 to 14.11.2017.

COURSE COORDINATORS

HEAD OF THE DEPARTMENT

DIRECTOR

COURSE FEEDBACK FORM

Academic Year		2017					
Term		ODD SEM					
Course Number							
Course Title		IBM Data Science					
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	X
(ii)	Has adequate prior exposure to the prerequisites	X
(iii)	Had to pickup relevant additional topics through concurrent study	✓
(iv)	Have no exposure to the background material	X

4. **The expectations for taking the course by the student are:**

(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	

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

Academic Year	2017
Term	ODD SEM
Course Number	
Course Title	IBM , Data Science
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	
(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	

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