



Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
 MUNSHI NAGAR, ANDHERI (WEST), MUMBAI - 400 058
 (Autonomous Institute Affiliated to University of Mumbai)



**AICTE Sponsored Three Two Week FDP on
 “Insights into Intelligent Automation, Machine Learning and Data Science”**

Tentative Schedule

[FDP 1- Foundation of Data Science](#)

[FDP 2 :Artificial Intelligence & Machine Learning](#)

[FDP 3 :Data Science & Its Applications](#)

Timings:

Inauguration: 9.30 to 10.00 am

Morning Sessions: 10.00 am to 1.00pm

Evening Sessions: 5.00pm to 7.00pm

Please note based on resource persons availability there may be changes in timings on few days.

FDP 1- Foundation of Data Science (19th Oct to 31st Oct 2020)

Approx. No. of Days	Contents
5 days	<p>Foundation of mathematics for data science</p> <ul style="list-style-type: none"> ● Maths for NN- activation functions <ul style="list-style-type: none"> ○ Introduction to python ○ Hands on using Python ● Math for ML,Linear Algebra, Tensors, Matrix operations, <ul style="list-style-type: none"> ○ Hands on using Python ● Statistics for data science: Population and samples. <ul style="list-style-type: none"> ○ Hands on using Python ● Descriptive statistics- Categorical, numerical, visualization: histogram, cross-table, scatter plots, mean, median mode, skewness, variance, standard deviation, covariance. <ul style="list-style-type: none"> ○ Hands on using Python ● Inferential statistics Standard error, hypothesis testing, Data visualization <ul style="list-style-type: none"> ○ Hands on using Python ● Probability refresher: Events, combinations, permutations and conditional probability. <ul style="list-style-type: none"> ○ Hands on using Python



To be covered during above lab sessions	<p>Introduction to Python -</p> <ul style="list-style-type: none">● Basic Syntax: Variables and Data Types● Functions● File Input and Output● Packages: Numpy, Scipy, Pandas, and Matplotlib, Sklearn.● Jupyter/Google-collab Notebook● Fundamental principles and methods of visualization<ul style="list-style-type: none">○ Hands on using Python for all above topics
2 days	<p>R Programming Fundamentals for data science</p> <ul style="list-style-type: none">● Working with data types and variables● Vectors, matrices, lists, and data frames● Data import● Logical statements: loops, repeats, and functions● Data plotting and visualization● Introduction to basic statistical functions and packages<ul style="list-style-type: none">○ Hands on sessions
4 days	<p>Scalable data science</p> <ul style="list-style-type: none">● High dimensional data preprocessing.● Memory-efficient data structures.● Approximate near neighbors search.● Map-reduce and related paradigms Map reduce.● Distributed Machine Learning and Optimization. <p>○ Hands on using Python</p> <p>Introduction to scala</p>
1 day	Exam, Feedback and Valedictory Session



FDP 2: Artificial Intelligence & Machine Learning (17th Nov (Tue) to 29th Nov (Sun) 2020)

Approx. No. of Days	Contents
3 days	Introduction to AI/ML: Basic terminology of AL/M, intelligent agents and environment. Maths for AI/ML: Linear Regression, Polynomial Regression, Decision Tree Regression, Random Forest Regression. ○ Hands on using Python
3 days	Problem Formulation and Solving: Learn to translate real-world problems in terms of AI/ML abstractions. Formulating Real World Problems for AI/ML Intuitive and Simple Algorithms Data Processing and Visualization Representation of Real World Data Supervised and Unsupervised Learning Classification and Regression Problems ○ Hands on using Python
2 days	ML Algorithms Solutions to Non-linear data using MLP Gradient Descent and Backpropagation Decision Trees and Random Forests Ensembles and Support Vector Machines Mining for Recommendations system ○ Hands on using Python
1 day	Natural language processing Basic terminology and steps involved in NLP: Data cleaning, tfidf algorithm, word embeddings, etc. ○ Hands on using Python
2 days	RPA -Evaluation of RPA, RPA development methodology, types of bots, Creating bots, application areas of bots.
	Various Case Studies during above sessions
1 day	Exam, Feedback and Valedictory Session



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FDP 3: Data Science & Its Applications (7th Dec to 19th Dec 2020)

Approx. No. of Days	Contents
4 days	Introduction to data science Life cycle of data science: Preparation, preprocessing, modelling, analytics, evaluation and visualization. Hands on session
3 days	Deep Neural Network Learning Techniques Introduction to Deep Learning Convolutional Neural Networks Auto-Encoders Recurrent Neural Networks GAN Hands on session
4 days	Real life applications of data science
1 day	Exam, Feedback and Valedictory Session