



Late Shri. Vishnu Waman Thakur Charitable Trust's

## VIVA Institute of Technology

Approved by AICTE, New Delhi, DTE, Government of Maharashtra, Affiliated to University of Mumbai  
At- Shirgaon, Post-Virar (E.), Tal-Vasai, Dist-Palghar – 401 305.

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### Department of Mechanical Engineering

**Topic Name:**

AICTE-ISTE Approved Five Days Short Term Training Program on “Data Science and Machine Learning by Python”

**Name of the Guest Speakers:**

Ms. Sonia Dubey, Dr. Janak Suthar, Ms. Archana Nanade, Mr. Yadnesh Zagade, Dr. Tatwadarshi P. Nagarhalli

**Date:**

01st July – 6th July 2022

**Time:**

09.30 am to 4.00 pm

### Programme Summary/Details:

The Department of Mechanical Engineering at VIVA Institute of Technology organized a five-day AICTE-ISTE approved short term training program (STTP) on “Data Science and Machine Learning by Python.” The purpose of the workshop was to provide fundamental knowledge on the rapidly growing field of artificial intelligence and the use of Python language, which is easy to learn and has simple syntax making it ideal for beginners. The program aimed to bring together researchers, students, academic experts, engineers & scientists from industry and R&D institutes to discuss recent advances in the field of data science and machine learning.

Day 1 began with a topic on Introduction to Data Science and Python, where Ms. Sonia Dubey spoke about the scientific method of extracting insights from data. Data Science uses structured, unstructured, high volumes of data, and follows a life cycle, including business requirements, data acquisition, data preprocessing, data exploration, modeling, and deployment. The cycle starts with understanding the problem and identifying the central objectives, followed by transforming data into a desired format and cleaning it, exploring patterns in the data to retrieve useful insights to form hypotheses, determining the optimal data features for a machine learning model, creating a model that predicts the target most accurately and evaluating and testing its efficiency, checking the deployment environment for dependency issues, and deploying the model in a pre-production/test environment and monitoring its performance. Practical sessions on basics of Python programming using libraries such as Numpy, Pandas, and Matplotlib were conducted.

Day 2 focused on supervised machine learning algorithms for regression and classification models. Dr. Janak Suthar delivered two sessions on the topic. Supervised learning involves training machines using labeled training data to predict output, using regression for continuous variables, such as weather forecasting, market trends, etc., and classification for categorical variables like yes/no, male/female, true/false, etc. Regression algorithms such as linear regression, regression trees, non-linear regression, Bayesian linear regression, and polynomial regression were discussed. Practical examples were conducted on linear regression using Python on Jupyter notebook. Classification algorithms such as K-nearest neighbor, decision trees, Naïve Bayes, and support vector machines were also covered, and practical examples were conducted on K-nearest neighbor using Python on Jupyter notebook.

Day 3 was dedicated to unsupervised machine learning algorithms, where Ms. Archana Nanade discussed models trained using unlabelled datasets and allowed to act on the data without any supervision. Unsupervised learning mainly deals with unlabelled data and allows performing more complex processing tasks compared to supervised learning. However, unsupervised learning can be more unpredictable compared to other natural learning methods.

On day 4 session was conducted by Mr. Yadnesh Zagde which was dedicate to Neural networks, also known as artificial neural networks (ANNs) or simulated neural networks (SNNs), are a subset of machine learning and are at the heart of deep learning algorithms. Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another. Artificial neural networks (ANNs) are comprised of a node layer, containing an input layer, one or more hidden layers, and an output layer. Each node, or artificial neuron, connects to another and has an associated weight and threshold.



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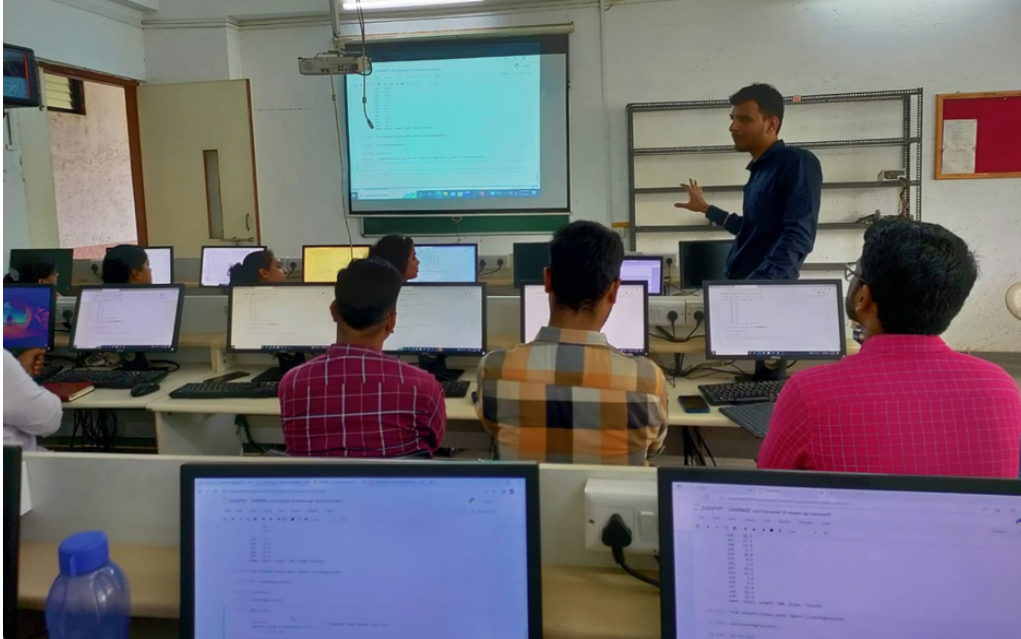
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On day 5 session was conducted by Dr. Tatwadarshi P. Nagarhalli. The session started with the existing applications of AI and what is the future and what will be the scope of research in the area of AI. Also the Speaker talked about Computer Vision for Defect detection: Until now the detection of defects is carried out by trained people in selected batches, and total production control is usually not possible. With computer vision we can detect defects such as cracks in metals, paint defects, bad prints etc. in sizes smaller than 0.05mm. Much better than the human eye.

### Photos:





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