



**VIT**  
Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)



**Teaching Learning Centre of Excellence (TLCE)**

**in association with**

**School of Advanced Sciences [SAS]**

**10-Day International Industrial Academia Program [I- IAP]**

**on**

**Python Industrial Training Topics for Beginners**

**By**

**Venat Ikkurthi, Senior Data Engineer**

**Lince Soft Solutions, USA**

| <b>Day 1: Core Python</b>                       |  |
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| Day-1 - 10.00 am – 1.00 pm                      | Data types, variables, operators, Control structures (if-else, loops), Functions and modules, File handling, Exception handling  |
| Day-1 - 2.00 pm – 5.00 pm                       | Object-Oriented Programming, Classes and objects, Inheritance, polymorphism, encapsulation, Special methods (_init_, __str_, etc.)   |
| <b>Day 2: Python Standard Libraries</b>         |  |
| Day-2 - 10.00 am – 1.00 pm                      | Working with Data- CSV, Excel, JSON file processing, Web scraping using BeautifulSoup / requests, APIs and HTTP requests   |
| Day-2 - 2.00 pm – 5.00 pm                       | Databases and SQL, Connecting to databases using sqlite3 or SQLAlchemy, Performing CRUD operations, Version Control with Git, Git basics: clone, commit, push, pull, Branching and collaboration                 |
| <b>Day 3: Python for Automation</b>             |  |
| Day-3 - 10.00 am – 1.00 pm                      | Automating tasks like file management, email, etc., Schedulers like schedule or AP Scheduler, Web Development (Django or Flask)-Setting up a project, Routing, templates, forms, CRUD operations with a database |
| Day-3 - 2.00 pm – 5.00 pm                       | Data Analysis and Visualization, Using Pandas, NumPy for data manipulation, Visualizations using Matplotlib, Seaborn, or Plotly  |
| <b>Day 4: Introduction to Machine Learning</b>  |  |
| Day-4 - 10.00 am – 1.00 pm                      | Basics with scikit-learn, Linear regression/classification demo, Model evaluation  |
| Day-4 - 2.00 pm – 5.00 pm                       | Unit Testing and Debugging, Writing test cases using unittest or pytest, Logging and debugging techniques  |
| <b>Day 5: Data Handling &amp; Visualization</b> |  |

|  |   |
|--|---|
| Day-5 - 10.00 am – 1.00 pm   | Data loading from CSV, Excel, and JSON, Data cleaning: handling missing values, duplicates  |
| Day-5 - 2.00 pm – 5.00 pm  | Exploratory Data Analysis (EDA), Visualizing data using Matplotlib and Seaborn, Correlation, distributions, and trend analysis  |
| <b>Day 6: Supervised Learning - Regression &amp; Classification</b>            |   |
| Day-6 - 10.00 am – 1.00 pm   | Train-test split and evaluation metrics, Linear Regression, Logistic Regression   |
| Day-6 - 2.00 pm – 5.00 pm  | K-Nearest Neighbors (KNN), Model accuracy, confusion matrix, precision, recall  |
| <b>Day 7: Unsupervised Learning &amp; Model Evaluation Clustering: K-Means</b> |   |
| Day-7 - 10.00 am – 1.00 pm   | Dimensionality Reduction: PCA (basic intro), Feature scaling (StandardScaler, MinMaxScaler)   |
| Day-7 - 2.00 pm – 5.00 pm  | Cross-validation, Bias-variance tradeoff  |
| <b>Day 8: Natural Language Processing (NLP) basics</b>                         |   |
| Day-8 - 10.00 am – 1.00 pm   | Text Preprocessing: Tokenization, Stopword Removal, Lemmatization, Stemming, Text Representation, Bag of Words (BoW), TF-IDF, Word Embeddings (Word2Vec, GloVe)   |
| Day-8 - 2.00 pm – 5.00 pm  | Basic NLP Tasks : Sentiment Analysis, Named Entity Recognition (NER), Text Classification, Language Modelling   |
| <b>Day 9: Natural Language Processing (NLP) basics</b>                         |   |
| Day-9 - 10.00 am – 1.00 pm   | Introduction to NLP Libraries : NLTK, spaCy, Hugging Face Transformers  |
| Day-9 - 2.00 pm – 5.00 pm  | AR (AutoRegressive): Uses past values : I (Integrated): Uses differencing to make data stationary, MA (Moving Average): Uses past forecast errors<br>Model Building Steps: Stationarity check (ADF test), ACF & PACF plots for parameter tuning, Model evaluation (AIC/BIC, RMSE) |
| <b>Day 10: Statistical Quality Control</b>                                     |   |
| Day-10 - 10.00 am – 1.00 pm  | Control Charts (X-bar, R-chart), Process Capability Analysis, Six Sigma Basics  |
| Day-10 - 2.00 pm – 5.00 pm   | Multivariate Statistics (Advanced) : Principal Component Analysis (PCA), Factor Analysis, Cluster Analysis, Discriminant Analysis   |

### **Event Coordinators :**

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